

**ASSESSING INFLUENCE OF FIRM CHARACTERISTICS ON THE EFFECT OF MOBILE
PHONE SERVICES ON FIRM PERFORMANCE:
A Case Study of Thika Town in Kenya**

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ABSTRACT

The purpose of this study was to assess the influence of firm characteristics on the effect of mobile phone services on firm performance. The study was carried out in Thika town in Kenya. It adopted an exploratory design where a two-stage, Stratified and Simple random sampling, technique was employed. A total of 120 questionnaires were self-administered yielding a response rate of 100%. Data was subjected to detailed exploratory analysis through descriptive procedures. Results revealed that firm characteristics have no statistical significant influence on the effect of Mobile phone services on firm performance.

Keywords: *Mobile Phone Services, Manufacturing firms, Performance, effect, Firm characteristics*

1.0 BACKGROUND

Entrepreneurship and innovation are of fundamental importance to our economy as they spur economic growth and wealth creation (Barringer and Ireland, 2008). There is wide agreement among economists that entrepreneurship is a crucial factor in the diffusion of new technologies (Science, 2001), international competitiveness, and the creation of new jobs.

Schumpeter (1883-1950) in his theory of economic development constructed a theory in which the entrepreneur is the source of all dynamic change in the market. In 1934, Schumpeter, whose contribution to entrepreneurship development is globally recognized, emphasized the process of 'creative destruction', indicating how entrepreneurial innovations make current products and technologies obsolete and fuel economic activity for new products. Kizner (1973), who is also widely recognized for his contribution to entrepreneurship development, puts emphasis on two main aspects: "alertness" to new opportunities and seizing an opportunity by taking further innovative actions. According to his theory, he suggests that alertness leads to the discovery of new opportunities and innovative actions.

Innovation has become more globalized over the last decade and its importance as a driver of competitive advantage in economies has increasingly grown. It is a very critical element in entrepreneurship since it is the ticket to delivering better unique products and services, new and more efficient production processes, and improved business performance. Innovation involves the creation of new designs, concepts and ways of doing things, their commercial exploitation and subsequent diffusion through the rest of the economy and society (Wickham, 2006).

The great expansion of information and communication technologies that has taken place during the last decade has set the stage for a new age of opportunities and challenges. The adoption of internet, mobile telephony and broadband networks in many developed countries has been found to have positive effect on firm performance. They provide speedy, inexpensive and convenient means of communication. According to the World Bank (2006), "firms that use ICT grow faster, invest more, and are more productive and profitable than those that do not".

Quite a few studies on the application of mobile phone services in firm operations have been published (Matskin and Tveit, 2001; Lee 2001; Kannan et al.; 2001. Balasubramanian et al., 2002). However, very little has been done to assess the influence of firm characteristics on the effect of mobile phone services on performance of manufacturing firms. The manufacturing sector in Kenya contributes around 13% to GDP and this has remained largely unchanged since 1995 (Kenya Association of manufacturers, 2006). It is therefore a key sector in the error of economic recovery and transforming Kenya into an industrialized nation in the year 2030. A firm's success rests to a very large extent on its ability to innovate and pursue new opportunities. Successful firms must seize every opportunity to use new technology, methods or ways of doing things. They must aim at coming up with new differentiated and unique products or services so as to gain a competitive edge over other similar ventures. This study aimed at investigating the influence of firm characteristics on the effect of mobile phone services on performance of manufacturing firms in Thika town.

1.1 Statement of the Problem

Strategies for enhancing competitiveness in manufacturing firms have become the need of the hour (Rao & Soumya, 2007). Entrepreneurs are in the habit of advancing entrepreneurial aspects of a venture, looking for new ways of doing things in the market so as to be unique, gain and maintain a competitive edge. They delight in destabilizing the market equilibrium and reaping maximum profits before the competitors venture into the same market.

Technology and its effective use in organizations has received much attention in the literature, firms have continued to invest large amounts of resources in mobile phone services hoping that good returns will be realised (Weil, 1992). A number of research studies to establish the contribution of mobile phone services to firm performance (Bender, 1986; Cron & Sobol, 1983; Turner, 1985; Lucas, 1975; Strassmann, 1985) have been carried out. Past studies reveal that firm characteristics can greatly affect entrepreneurial development. Mohd (2005) documented that firm characteristics play a pivotal role in determining not only the performance of the firm but also how well entrepreneurship has been developed in firms. A study by Wiklund and Shepherd (2005) indicated that firms that are able to align certain firm features with the characteristics of the environment outperform other firms. Empirical studies have therefore documented that a positive relationship exist between firm attributes and entrepreneurial development. However the influence of firm characteristics on the effect of mobile phone services on firm performance is not exactly known. This study therefore sought to determine the extent to which firm characteristics influence the effect of mobile phone services on performance of manufacturing firms in Thika town.

2.0 LITERATURE REVIEW

2.1 Introduction

Systematic review of literature was undertaken in four phases: The Disruptive Innovation Model, ICT and firm performance, Mobile phone and Mobile phone services, Firm characteristics and performance.

2.2. The Disruptive Innovation Model

Innovation can be defined as all the scientific, technological, organizational, financial, and commercial activities necessary to create, implement, and market new or improved products or processes (OECD, 1999). The constant changing conditions of the global market forces brings about stiff competition among firms which means that to survive firms must innovate or else they perish(fig1).

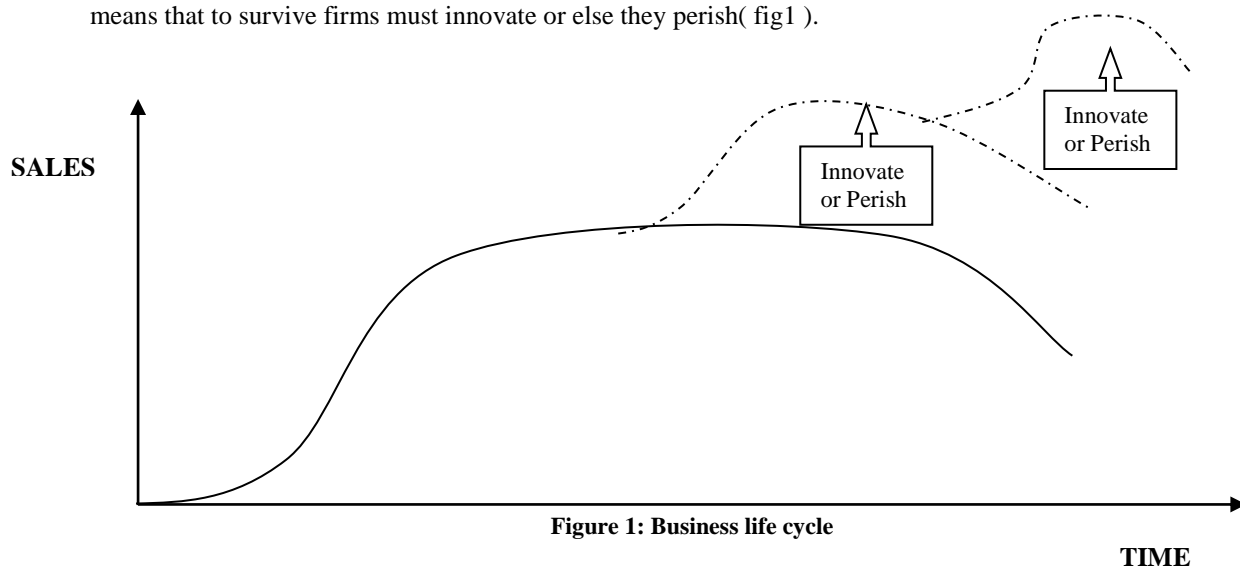


Figure 1: Business life cycle

In order to survive, firms must adopt disruptive approaches so as to take advantage of competitor weaknesses and blind spots to create differentiated, defensible growth strategies. The potential of disruptive innovation includes: Making the ugly attractive to overshot customers who don't value or use all of the benefits of existing products and providing cheaper, simpler or more convenient solutions.

2.3. Information Communication Technology (ICT)

Economies at all levels are being transformed by the rapid development, adoption, and use of ICT innovations. In this respect, ICT functions as a new generic general purpose technology, which impacts these economies both broadly and deeply by generating a wide array of new products, production processes and services (Brynjolfsson & Kahin, 2000). ICT is routinely deployed in organisations to re-engineer processes, gain new strategic advantages, or network across organisational boundaries, they change both the internal organisation of companies and other organisations and the relationships between companies and organisations (OECD, 2002). A number of studies show that ICT and changes of the internal organisation of firms have significant positive effects on labour productivity (Bresnahan, Brynjolfsson & Hitt, 2002).

2.4 Mobile Phone Services

A Mobile phone is an important ICT tool for development. It has the ability to easily leapfrog the infrastructure barriers in remote and rural areas in Africa. It offers "anywhere, anytime" convenience which is a disruptive innovation advantage.

The rapid technological advancement that the world has witnessed in the recent years especially in the electronic industry has also changed the means of production around the world (Bwisa, 2010). This can be evidenced in the telecommunication sector where, since the introduction and evolution of the mobile phones, the ways and means of business information transfer have changed leading to more efficiency and productivity in both service and manufacturing sector.

In Kenya Key Mobile phone services include: mobile calls, mobile instant messaging, M-Pesa ¹ Mobile bills payments; Mobile internet browsing and lately banking services e.g. M-kesho. ²Mobile services are strategic weapons for enhancing business performance. Several previous researches have explored such opportunities (Gressgard and Stensaker, 2006; Smith, 2006; Andreou et al, 2005; Buellingen and Woerter, 2004; Mathew et al, 2004). Pangani (2004) mentions mobility, availability (anytime, anyplace), and personalization as important benefits of mobile phone services.

2.5 Firm Characteristics

Most manufacturing firms are managed by the entrepreneurs. Both the nature of the firm and the characteristics of the entrepreneur are quite crucial since they constitute firm characteristics which could tremendously affect the overall success of a firm. It is therefore critical to investigate the moderating influence of firm characteristics on the effect of Mobile phone services on firm performance.

Quite a number of studies have been carried out to examine the relationship between firm characteristic and entrepreneurial activities. Mohd (2005) asserted that firm characteristics seem to play a critical role in determining the overall performance of the firm. Findings of a study carried out by Wiklund and Shepherd (2005) indicates that firms that are able to align firm attributes with the characteristics of the environment outperform other firms. Dean, Bülent and Christopher (2000) documented that firm characteristics are essential determinants of firm performance and success. However Dean et al., (2000) acknowledged that relationship between firm characteristics and entrepreneurial performance is a controversial issue in the field of research.

2.6. Critique of existing Literature

A clear picture of the moderating influence of firm characteristics on the relationship between mobile phone services and firm performance has not emerged from previous studies. The existing body of knowledge is not sufficient enough to explain the influence of firm characteristics on the effect of mobile phone services on firm performance.

¹ Mobile Phone Money Transfer

² Mobile banking/saving service

3.0 METHODOLOGY

3.1 Research Design

This study adopted exploratory research design to examine the moderating influence of firm characteristics on the relationship between Mobile Phone services and firm performance.

To investigate this relationship quantitative research approach was employed. Accurate, valid and reliable conclusions were drawn by engaging descriptive analysis. To ensure a more complete approach to empirical research, longitudinal data (Weill, 1992; Gretton, Gali & Parham 2002) for the past three years was collected in a sequence so as to track the magnitude of change that would have taken place. Use of a questionnaire backed up by field observation revealed some information and data that gave a bearing on the influence of firm characteristics on the effect of mobile phone services on firm performance of the 120 manufacturing firms examined. The target population comprised of all Small, Medium and Large manufacturing firms in Thika town that had been in operation for at least three years. The sampling frame comprised of 200 manufacturing firms.

3.2 Sampling Techniques

In this study the statistics formula for determining the sample size and procedures for categorizing data (Cochran, 1977) below was adopted to calculate a representative sample.

$$e = Z\alpha \sqrt{\frac{pq}{n}} \quad \text{Where } \alpha = 0.05 \text{ and } Z = 1.96.$$

Using the standard values and the formula, a sample of at least 118 manufacturing firms would be representative. In this study a representative sample of 120 was preferred. A two-stage sampling technique was employed. In the first stage firms were stratified into three groups (Small, Medium and Large) according to the number of employees while in the second stage simple random sampling technique was applied where each manufacturing firm from each stratum was given a serial number in its respective category and the numbers picked at random. A total number of 14 large, 34 Medium and 72 small manufacturing firms were sampled. The sample size was therefore 120 in the ratio: 3:7:15 representing Large, Medium and small manufacturing firms respectively.

3.3 Research Instruments

Data was collected by use of a structured questionnaire and field observation for triangulation purposes. The questionnaire constituted four parts: Part I contained questions based on the background of the firm, Part II constituted questions on the usage of mobile phones in the firms, Part III contained questions on a 5 point Likert scale of 1-Never, 2-Rarely, 3-Sometimes, 4-Often and 5- Very Often testing the contribution of each of the independent variables and Part IV had questions on the effect of mobile phone services on measuring firm performance.

3.4 Data Collection Procedures

Secondary data was collected from literature review using desk research approach. A survey of related literature was undertaken from the internet, journals and other related documents. The Questionnaire was self – administered with the help of research assistants to the 120 manufacturing firms which had been in operation for a minimum of three years.

3.5 Data Processing and Analysis

The Data was subjected to detailed exploratory analysis through descriptive procedures. Reliability and internal consistency of the measurement models were tested using Cronbach's alpha which is a measure of how closely related a set of items are as a group. Reliability and internal consistency analysis was employed to indicate the degree to which performance indicators measured the dependent variable (Firm Performance). A "high" value of alpha (reliability coefficient of 0.70 and above) is often used as evidence of the fact that the items measure an underlying (or latent) construct. The closer alpha value is to one the better (indicates internal consistency).

4.0 ANALYSIS OF THE FINDINGS

To analyze the moderating effect of firm characteristics (category of the firm, entrepreneurs' age and education, location of the business, gender, religion and form of enterprise), on the effect of Mobile Phone services on the dependent variables, in this case the financial and operational aspects of manufacturing firms, tests were carried out and the results presented graphically.

4.1 Analysis of the effect of Location as a moderating factor

Looking at figure 2, location of the manufacturing firm seems not to have any significant influence on the effect of mobile call service on firm performance. The magnitude of the influence is the same within the CBD, 2Kms

away and 5-10 Km away. In all cases mobile phone call service seem to have the greatest effect on performance signified by mean greater than 3.0 (which is the reference line).

It must be noted that location has a significant influence on the effect of Mpesa on firm performance. It is highest 2kms from the CBD (probably due to the manufacturing firm’s proximity to the customers or clients which then does not necessitate frequent money transfer. However it must be noted that even so, its influence is significantly positive since it is way above the reference line ($\mu=3$). The same scenario is observed for mobile messaging. However it is interesting to note that the effect of location on the influence of mobile messaging on firm performance is higher than that of Mpesa 2kms from the CBD which can be explained by the fact that communication to clients could basically be through sending short messages.

Considering the influence of location on the effect of Mobile banking and Mobile internet, it is important to note that whereas it has no influence in CBD and 5-10kms away (Below a mean of 3); it has significant influence on both mobile phone services 2kms away since the mean is above the reference line of 3). In general location has greater influence on the effect of mobile phone service on firm performance 2kms away from the CBD. This can be explained by the fact that most manufacturing firms prefer being slightly out of CBD to avoid having to contend with issues resulting from concentrating businesses within the CBD e.g. packing. Besides most manufacturing firms 2kms away are more service based as compared to those which are 5kms away which are product based.

To determine whether there were any significant differences between the means of the three groups of location one-way Analysis of Variance (ANOVA) was used. Specifically, to test the null hypothesis:

$$H_0 : \mu_1 = \mu_2 = \mu_3 \text{ (Mobile internet)}$$

Where μ = group mean

Looking at the results in table 1 below, there was a statistically significant difference between the categories ($F(2, 65) = 5.325, p=0.007$) indicating that at least one category differs with the rest. To identify the differing categories Post Hoc analysis was carried out using Student-Newman-keuls. The results showed that category 1 and 3 are not significantly different. Category one and two also form a homogeneous subset implying that only category 1 differ with 2.

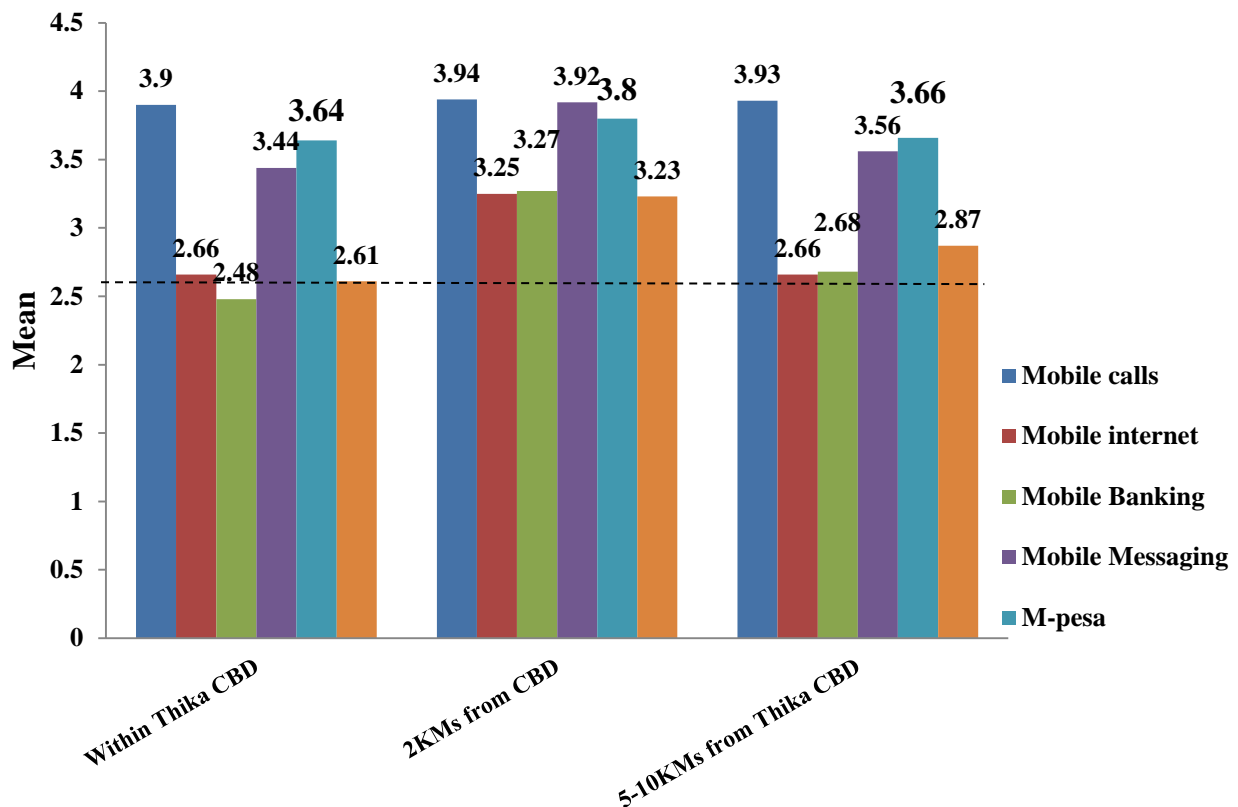


Figure2: Effect of Location of the firm as a moderating factor

Table 1 One Way ANOVA for the Three Categories of Location

		Sum of Squares	df	Mean Square	F	Sig.
Mobile calls	Between Groups	0.153	2	0.08	0.507	0.604
	Within Groups	13.114	87	0.15		
	Total	13.267	89			
Mobile Internet	Between Groups	4.899	2	2.45	5.325	0.007
	Within Groups	29.898	65	0.46		
	Total	34.797	67			
Mobile Banking	Between Groups	3.957	2	1.98	4.971	0.01
	Within Groups	25.873	65	0.40		
	Total	29.83	67			
Mobile Messaging	Between Groups	2.898	2	1.45	4.789	0.011
	Within Groups	21.781	72	0.30		
	Total	24.679	74			
Mobile Pesa	Between Groups	1.147	2	0.57	2.05	0.136
	Within Groups	20.973	75	0.28		
	Total	22.119	77			
Mobile Bills payment	Between Groups	3.226	2	1.61	2.497	0.09
	Within Groups	43.273	67	0.65		
	Total	46.499	69			

4.2 Analysis of the Influence of Gender as a moderating factor

This study revealed that manufacturing industry is male dominated with 80.8% of firms owned by men whereas only 19.2% were owned by women.

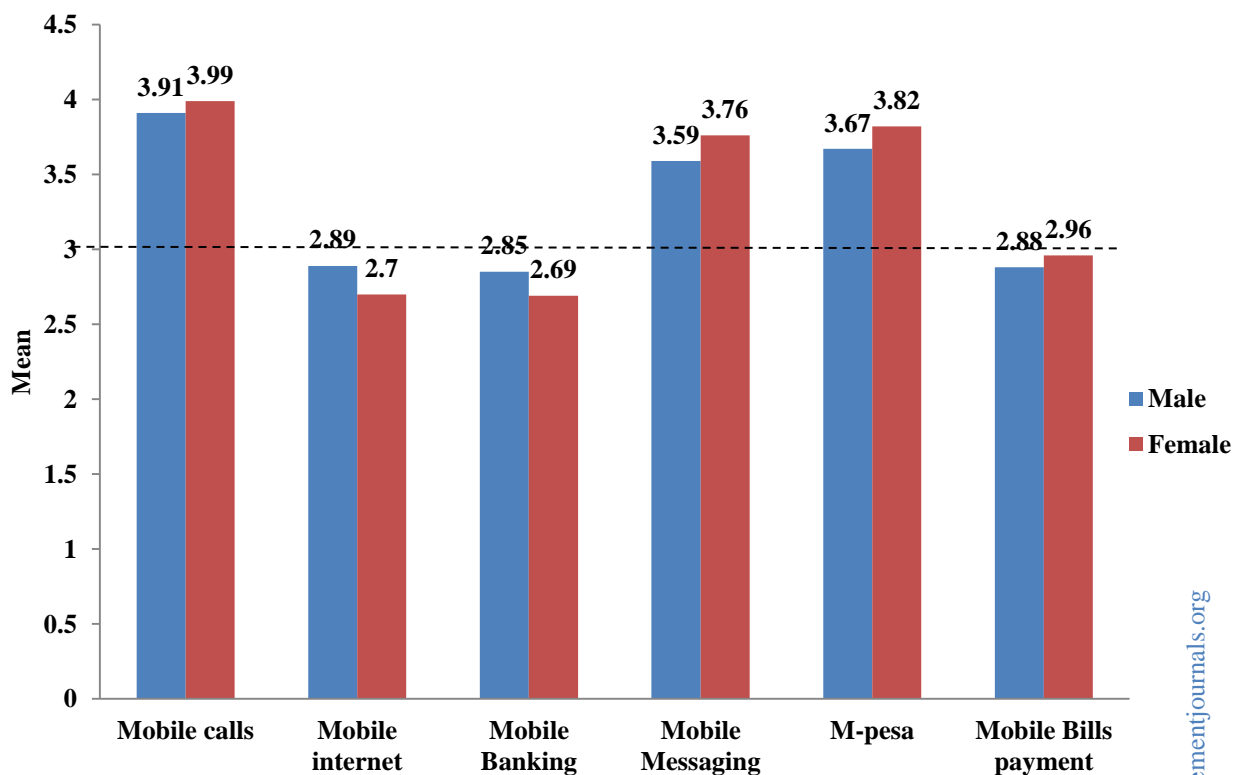


Figure 3: Influence of gender as a moderating factor on the effect of mobile phone services

The empirical findings of the study reveal that gender influences the effect of some mobile phone services on the performance of the firm. Looking at figure 3, the influence of mobile phone services on the firms is grouped with regard to gender of the owner of the firm. The graph shows that gender has great influence on the effect of mobile phone calls on firm performance. The means for male and female (3.91 and 3.99 respectively) are far above the average mean or reference line of X is 3. It is important to note that gender influence on the effect of mobile phone calls on firm performance is highest for female owned manufacturing firms. It is also evident that M-Pesa and mobile messaging service's effect on firm performance are influenced to a significant extent by gender (X is greater than 3) implying that the magnitude of their influence is above the reference line. However, gender has no significant influence on the effects of mobile banking, mobile internet, and mobile bills payments on firm performance (means are below the reference line of 3).

To determine whether there were any significant differences in the output in the level of influence between the male and female, independent samples t-test was conducted ($H_0: \mu_m = \mu_f$) and the results revealed that there was no significant difference in the output in the level of influence between the male and female. The tests were therefore done but none was found to be significant.

4.3 Analysis of the Influence of Age as a moderating factor.

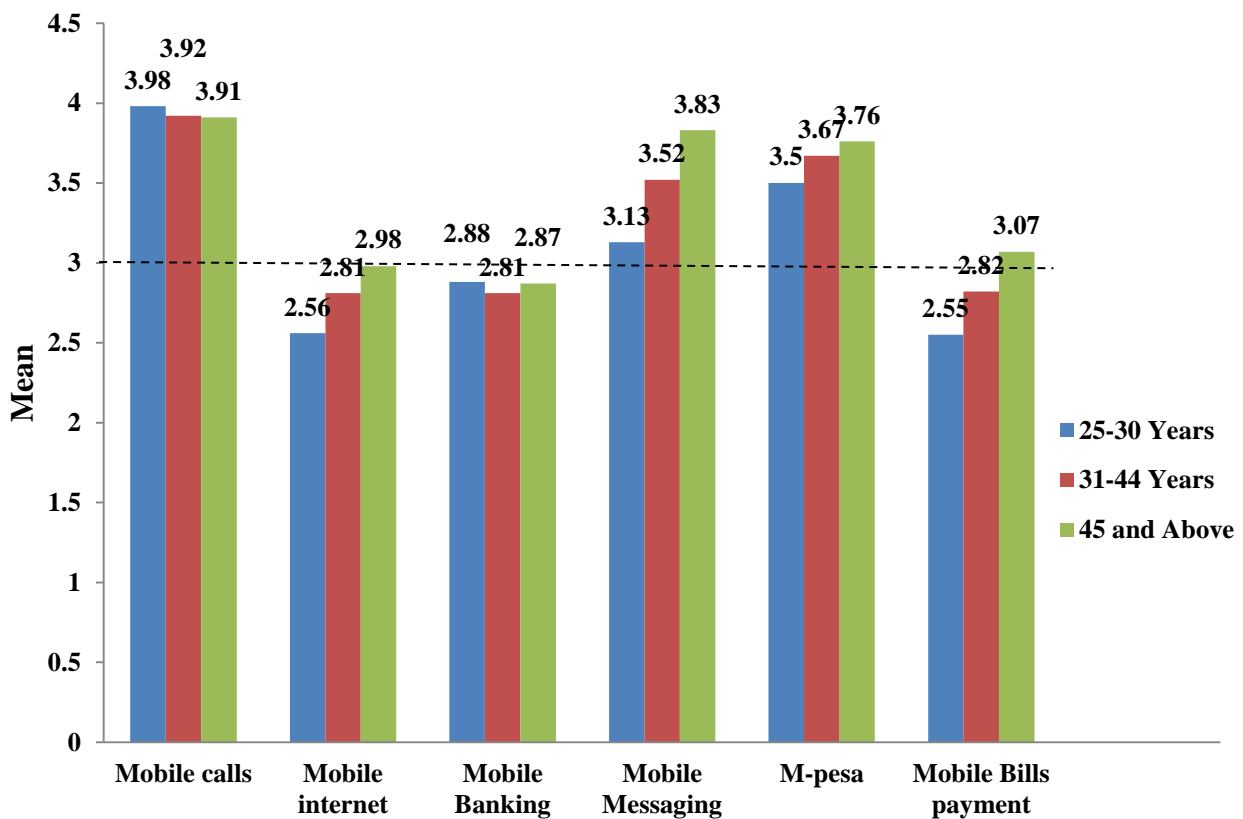


Figure 4: Influence of age on the effect of mobile phone services

Considering age as a moderating factor M-pesa seems to be prevalent among the slightly older entrepreneurs (45 and above) in which case it has greater positive influence (far above the reference line of 3) on performance of manufacturing firms owned by entrepreneurs in this age bracket. The supposition here is that the older people find it easier to carry out transactions by way of money transfer so as to save on money, strain and time. From the empirical findings (Figure 4) of the possible influence of mobile phone services on firm performance with regard to the age bracket of the firm owners, mobile phone services such as mobile calls and M-pesa have positive influence (mean greater than 3.0) in all the age brackets. Mobile messaging had an influence on firm performance owned by age bracket of 31-44 years and those above 44 years. However, in the age bracket of 25-30 years, mobile messaging has no influence on the performance of the firm. It is worth noting that Mobile

banking in all the age brackets does not influence the performance of the firms in any way. Similarly, mobile internet is not influential in the age bracket of 31-44 and 25-30 but entrepreneurs who are above 44 years find the use of mobile internet to be slightly influential (mean is slightly above 3.0) on the performance of the their firms.

To determine whether there were any significant differences in the output in the level of influence at different age brackets, independent samples t-test was conducted and the results revealed that there was no statistically significant difference between group means since the means were very close to one another. The tests were therefore done but none was found to be significant.

4.4 Analysis of the Influence of Religion on the effect of mobile phone services

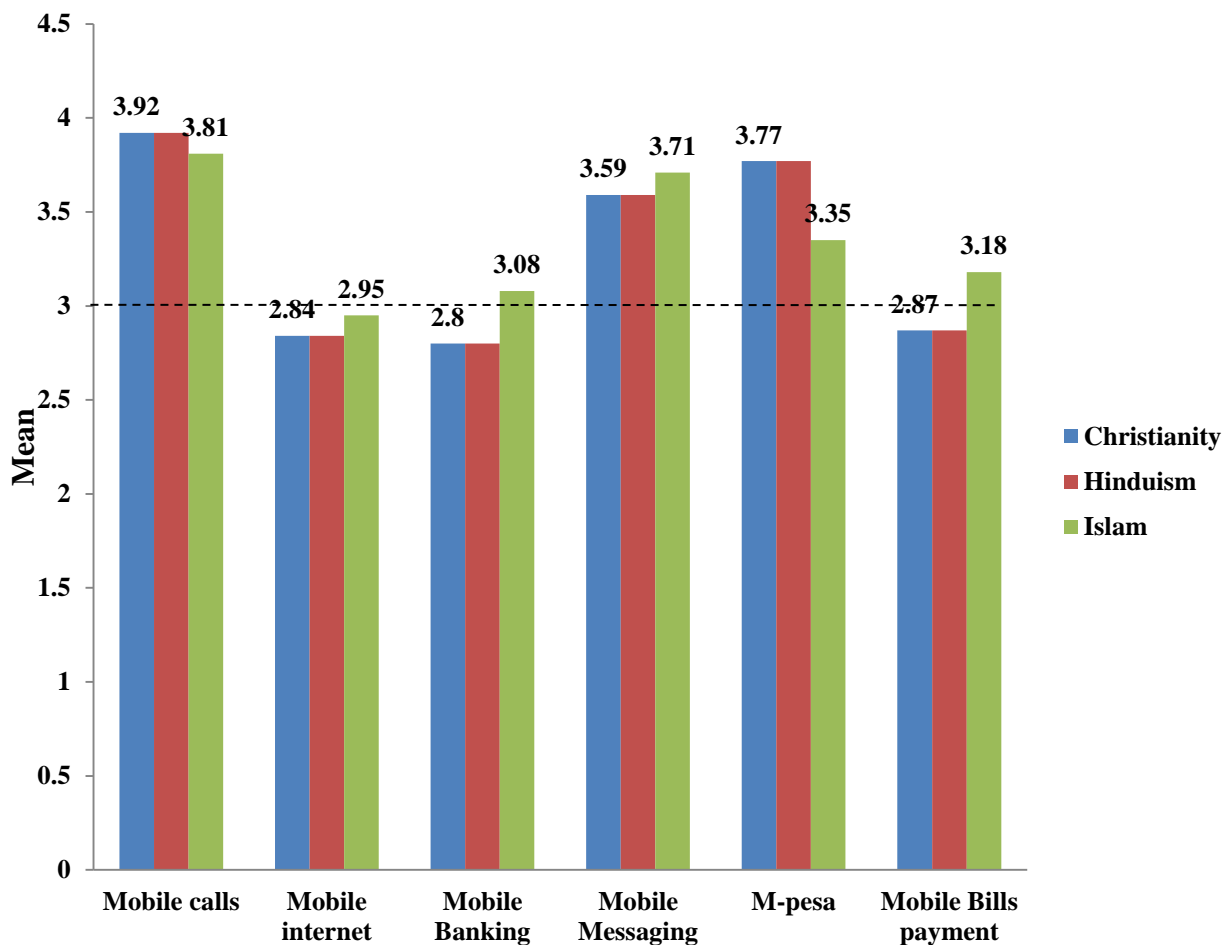


Figure 5: Influence of religion on the effect of mobile phone services

Empirical analysis of the influence of religion on the effect of mobile phone services on firm performance indicates that Mobile calls is greatly influenced (mean is above 3.00) for all the firms owned by Christians, Islam and Hinduism. Similarly effect of Mpesa and Mobile messaging on the performance of manufacturing firms is significantly influenced by the type of religion the owners profess. However the type of religion the owners of the manufacturing firms profess has no significant (mean is less than 3.0) influence on the effect of Mobile internet and Mobile banking on firm performance. Conversely, mobile internet's effect on firm performance is slightly positively influenced by the profession of Hindu religion by the owners. Mobile banking is less influential (less than 3.0) in the performance of firms owned by Hindus. The fact that the owner of the manufacturing is a Muslim does not influence the effect of mobile internet on firm performance.

To determine whether there were any significant differences in the output in the type of religion the entrepreneurs profess, independent samples t-test was conducted and the results revealed that there was no statistically significant difference between group means since the means were very close to one another. The tests were therefore done but none was found to be significant.

4.5 Discussion of findings

Hashim (2005) asserted that firm characteristics seem to play a vital role in determining the performance of the firm and can further determine how well the entrepreneurship have been developed in the country. The empirical findings of this study concur with Hashim's findings in that firm characteristics were found to influence the effect of mobile phone services on the performance of manufacturing firm though to a very small extent

It is important to note that gender influence on the effect of mobile calls on firm performance was highest for female owned manufacturing firms. This is in tandem with the findings of Venkatesh and Morris [2000], which revealed that women underline the importance of perceived ease of use both at the adoption stage as well as after gaining experience with the use of the technology whereas men attach higher importance to perceived usefulness than women in their decision to use the services both in the short and long run. However Venkatesh and Morris findings are incompatible with part of the findings of this study which indicated that gender had no significant influence on the effects of mobile banking, mobile internet, and mobile bills payments on firm performance.

According to Orloff (2002), location plays a very vital role in the development of entrepreneurship. A strategically located firm has a greater chance of succeeding. Minai and Igwe (2011) assert that location does moderate the relationship between firm characteristics and firm performance and infact has strengthened the relationship between firm characteristics and firm performance. Findings of this study concur with the findings of past studies in that location has greater influence on the effect of mobile phone service on firm performance 2kms away from the CBD.

From the empirical findings of the possible influence of mobile phone services on firm performance with regards to the age bracket of the firm owners, mobile phone services such as mobile calls and Mpesa and Mobile instant messaging potentially advance the effect of mobile phone service on firm performance. This is consistent with the findings of Lu, Yu, and Liu; (2006) which indicate that age influence technology by indirectly influencing its use through perceptions and technology use.

4.6 Summary and Conclusion

In summary One Way ANOVA was conducted for farm characteristics such as location, gender, education level, religion and age bracket of the entrepreneurs, category of the firm and form of the business. In all cases except location, the results ($p > 0.05$ at $\alpha = 0.05$) revealed that there was no statistical significant differences between group means. POST HOC analysis was conducted using the Student-Newman-Keuls to check the statistical significant differences between independent variables constituting the farm characteristics. In all cases except location all the categories were not statistically significantly different. Therefore, the means of the effects of each mobile phone services on each characteristic of the firm were not statistically significantly different from each other. This implied that there was no statistical significant ($p > 0.05$ at $\alpha = 0.05$) differences between independent variables constituting the farm characteristics. In conclusion farm characteristics have no statistical significant influence on the effect of mobile phone services on firm performance.

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