

Effect of Mobile Phone-Based Digital Technologies on the Performance of Refugee Women-Led Micro, Small and Medium Enterprises in Kakuma Refugee Camp

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ABSTRACT

The contribution of Micro, Small, and Medium Enterprises (MSMEs) to economic development as well as the role of digital technology in MSME performance are underscored in many studies globally. MSMEs provide over 70% of employment, contribute to national revenue, and are considered key to increasing productivity. In Africa, MSMEs are also recognized for skill development and upward mobility in diverse geographic areas and economic sectors, provide livelihood and income for diverse segments of the labor force, and are the backbone of Africa's economy as well as key to its most pressing development challenges. Despite the potential of MSMEs for economic growth, many face a myriad of challenges, both internal and external to the firm, that constrain their performance and ultimate survival. This is especially critical for refugee-owned enterprises. In light of the constraints, the utilization of digital technology has emerged as an important strategy to secure the growth, performance, and survival of MSMEs. The objective of this study was to examine the effect of mobile phone-based digital technologies on the performance of refugee women-led MSMEs in Kakuma Refugee Camp. Two theoretical frameworks underpinned this study: the Resource-Based View (RBV) proposed by Barney (1991) and the Technology Acceptance Model (TAM) theory proposed by Davis (1986). The study adopted an analytical cross-sectional survey design for primary data collection using questionnaires. The targeted population was sampled using a stratified simple random sampling technique. A total of 111 enterprises were surveyed using a questionnaire. Descriptive statistics were generated to give summaries and describe the sample characteristics, while inferential statistics comprised correlation and regression analysis. The study found that mobile phone-based technology was a significant predictor of performance ($r = 0.501$, $p\text{-value} = 0.000 < 0.05$). The study recommends that mobile phone-based technology should be prioritized since it leads to an increase in sales and profits for a firm through improved mobile phone transactions.

Keywords: Micro, Small and Medium Enterprises (MSMEs), Mobile Phone Based Digital Technologies, Performance

I. INTRODUCTION

The performance of Micro, Small, and Medium Enterprises (MSMEs) is increasingly emerging as an area of critical concern globally. This is attributed to the positive impact MSMEs have on the economic development of a country. In the United Kingdom, MSMEs are reported to contribute 47% of national revenue and are considered key to increasing productivity (Hart & Roper, 2016). In Pakistan, MSMEs in rural areas are reported to contribute 45% to the national economy and are noted to have great potential for stimulating sustainable growth (Shah et al., 2011). In Africa, Cariolle (2020) reports that small African businesses were employing around 80% of the subcontinent's workforce by the year 2015. In East Africa specifically, Chowdhury and Wolf (2017) observe that in addition to value addition, MSMEs contribute significantly to the economy and manufacturing sector in particular, with an average of more than 50% of the employed labor force across Kenya, Uganda, and Tanzania. Osano (2019) notes that about 80% of companies in Kenya are MSMEs and contribute approximately 40% of GDP. In displacement contexts like Kakuma Refugee Camp, MSMEs have not only created livelihood opportunities and improved incomes for both refugees and host communities but also sustained a vibrant informal market economy worth \$56 million (Manji, 2019; Sanghi et al., 2016; International Finance Corporation [IFC], 2018).

Despite the contribution of MSMEs, myriad challenges have limited their growth and performance. Within Africa, MSMEs face challenges such as power shortages, lack of capital, poor management skills and competencies, inadequate information and corruption, low diffusion and use of digital technologies, and institutional and market

failures that constrain access to finance (Muriithi, 2017; Cariolle, 2020; Disse & Sommer, 2020). Specifically, Mwobobia (2022) observes that small-scale female entrepreneurs in Kenya have to grapple with lack of finance, discrimination, problems with the local authorities, multiple duties, poor access to justice, and a lack of education, among others. In refugee contexts, major constraints documented comprise limited access to markets, credit, and property ownership; high rates of informality; low levels of educational attainment; low financial literacy; low savings; and a high cost of doing business (IFC, 2018; Manji, 2019).

Technology innovation is recognized among key factors that influence MSEM growth and performance (Chinomona, 2013; Chege and Wang, 2020; Loku and Loku, 2020; Yadewani et al., 2023). Digital tools and technologies have been used to support refugee-owned enterprises in Kakuma, including access to the international market through digital skills training and market linkages (Hayatama, 2018). Specifically, mobile phone-based digital technology utilization is widespread in MSMEs compared to other forms of digital technology (Cariolle, 2020). In the Kakuma refugee context, a study by Hounsell and Owuor (2018) on innovative mobile solutions found that mobile phone access in Kakuma is especially high, with almost 99% of respondents either owning or sharing a mobile device. There is growing evidence indicating a positive association between mobile phone-based digital technology utilization and the performance of MSMEs (Perekwa et al., 2016; Rumanyika & Galan, 2015; Cole et al., 2021).

1.1 Statement of the Problem

Kakuma Refugee Camp has experienced a rapidly expanding information and communications technology infrastructure in the last decade that is widely viewed as having enhanced socio-economic opportunities and prospects for both the host community and refugee entrepreneurs. Also, humanitarian and private sector actors are still aiming to help refugee youth and women entrepreneurs, especially through livelihoods and economic empowerment programs that teach them digital skills and connect them with markets (United Nations High Commissioner for Refugees [UNHCR], 2017; Hayatama, 2018). However, a recent study by the International Finance Corporation (IFC, 2018) established that male refugee entrepreneurs continue to dominate MSMEs ownership in the camp, with women refugees considered less likely to own a shop. The encampment policy by the Government of Kenya disadvantages refugee entrepreneurs in relation to external market access for products, services, and business inputs. The relatively lower extent of digital technology utilization in business management processes among women-led enterprises compared to those owned by their male counterparts has exacerbated this challenge for women entrepreneurs and hence limited enterprise growth, performance, and survival. This has consequently limited the contribution of and opportunities for women entrepreneurs in the vibrant and expanding Kakuma economy, despite them being recognized among the most vibrant refugee artisans in Kakuma Refugee Camp (UNHCR, 2017). Whereas a study by Samuel Hall (2018) led by Benjamin Hounsell found that mobile phone access in Kakuma is especially high, with almost 99% of respondents either owning or sharing a mobile device, there is no known information on how this high access to mobile phones impacts MSMEs, especially those owned by women. The same report states that in Kakuma Camp in Kenya, over 72% of refugees have access to 3G connectivity. Similarly, there is no record of how these impacts affect MSMEs, specifically women-led MSMEs. Examining this relationship through an empirical study is therefore important to establish evidence of mobile phone-based digital technologies that are crucial for the growth, performance, and survival of refugee women-led enterprises within refugee camp contexts.

1.2 Objectives of the Study

To determine the effect of utilizing mobile phone-based digital technologies on Refugee Women-Led MSMEs performance in Kakuma Refugee Camp

1.3 Research Hypothesis

H₀₁: There is no significant positive association between utilizing mobile phone-based digital technologies and Refugee Women-Led MSMEs performance in Kakuma Camp.

II. LITERATURE REVIEW

2.1 Theoretical Framework

Two theoretical frameworks underpinned this study: the Resource-Based View (RBV) proposed by Barney (1991) and the Technology Acceptance Model (TAM) theory proposed by Davis (1986). According to the RBV theory, an enterprise's internal resources and capabilities are unique and uncopyable, giving it a competitive advantage. According to Barney (1991), these resources can be categorized as physical capital resources, such as the

physical technology an enterprise utilizes; human capital resources, which comprise experience, intelligence, training, judgment, relationships, and insights from employees; and finally, organizational capital resources, which comprise planning, managing, and coordinating systems. On the other hand, capabilities entail tangible or intangible processes and information that help a company create efficiency and improve its productivity (Kozlenkova et al., 2019). According to the TAM theory, perceived usefulness and perceived ease of use are the two key beliefs that directly affect technology use intention. Perceived usefulness examines the user's belief that utilizing a specific program will enhance their task performance, while perceived ease of use examines the ease of use, learning, flexibility, and clarity of the interface.

These theories relate to this study from two perspectives. The RVB identifies mobile phone-based technology as the physical resource the enterprise owns and how it puts it to use to improve efficiencies and business processes. The TAM theory facilitates an understanding of the drive for mobile phone-based technology utilization among refugee women-led MSMEs and the outcomes envisaged.

2.2 Conceptual Framework

The conceptual framework that guided this study illustrates the connection between the independent variable (mobile phone-based digital technologies) and the dependent variable (MSME performance). As shown in Figure 1, the framework outlines the three different utilizations of mobile phone-based digital technologies and the three different dimensions of MSME performance.

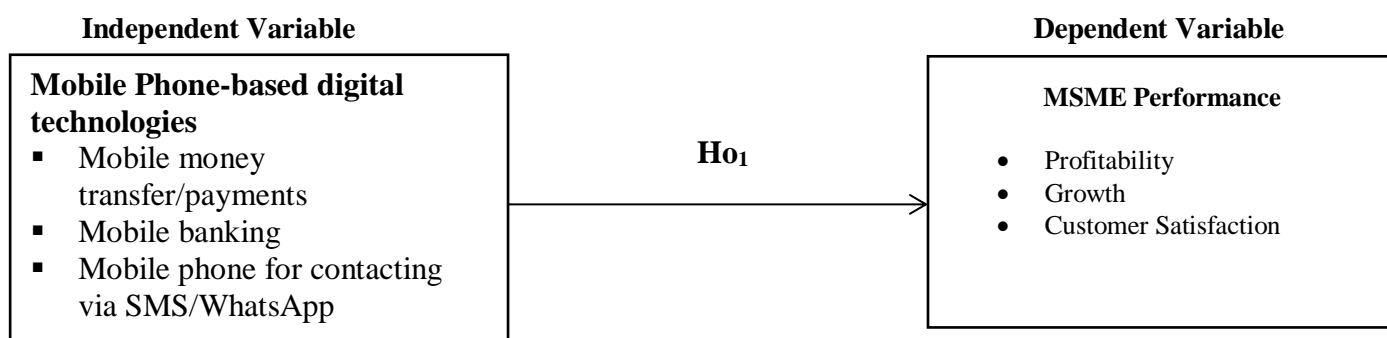


Figure 1

Conceptual Framework

Source: Self Conceptualization (2023)

2.3 Empirical Literature Review

2.3.1 Mobile Phone-based Digital Technologies and MSME Performance

Mobile phone-based digital technologies have been found to be widely utilized by MSMEs compared to other forms of ICT. According to Cariolle (2020), the use of mobile phones improves business performance by reducing information search and other transaction costs, while mobile money as a digital financial service has enabled enterprises to participate in various types of electronic financial transactions such as bills and salary payments off-line through SMS. Zhu and Wang (2022) point out that the mobile banking provided through online mode has made banking more accessible. More broadly, Ahad (2016) argues that the usage of mobile phones has the potential to achieve national development visions and create socioeconomic development opportunities for SMEs based in rural areas.

Evidence of the association between mobile phone-based digital technologies and MSME performance continues to emerge. In a study on mobile phone-based business training for micro-entrepreneurs in India and the Philippines, Cole et al. (2021) found that the training had a statistically significant impact on the adoption of improved business practices. In a survey on the use of mobile phones by microentrepreneurs in Kigali, Donner (2006) established a positive impact of mobile phone ownership and use on the social network of microentrepreneurs. In their study on the impact of mobile technology on micro and small enterprises in Zimbabwe, Perekwa *et al.* (2016) found that mobile technology amplified communication and relations with customers, MSE's productivity, and MSE's revenues, as well as spurred new and innovative offerings such as mobile money, mobile banking, and mobile advertising for the MSEs. Rumanyika and Galan (2015), in their study on the dynamics of mobile phone technologies and the performance of micro and small enterprises in Tanzania, found that the use of smartphones has a significant impact on the capital growth of micro and small enterprises compared to normal phones. In a study of ICT usage and



its impact on the profitability of MSMEs in 13 African countries, including Kenya, Esselaar *et al.* (2016) found that mobile-phone-based ICT has a significant impact on profitability for informal MSMEs compared to formal MSMEs and large businesses and a positive effect on labor productivity for both informal and formal MSMEs.

Specific to the Kenyan context, recent studies acknowledge the impact of mobile phone-based digital technologies. In a study on the effect of mobile phone money transfer applications on the performance of MSEs in Kenya, Makee *et al.* (2019) found that the utilization of mobile phone money transfer services was insignificant on enterprise performance aspects such as increase in customers, income, reduced operational costs, and increased profits. In a study on the effect of mobile phone technology on the performance of micro- and small-scale enterprises, Mugalo (2021) found a significant effect of mobile phone-based savings facilities and mobile phone internet facilities. In a study on mobile phone usage and its impact on the performance of micro and small enterprises in the Kenyan informal economy, Litondo (2018) found that the usage of mobile phones in business has a significant effect on the sales of micro and small enterprises. In the study on mobile payment and mobile money transfer on the performance of micro, small, and medium enterprises in Kenya, Mutiso and Reuben (2021) found a significant positive effect of mobile payment and mobile money transfer on the performance of micro, small, and medium enterprises.

III. METHODOLOGY

This study adopted an analytical cross-sectional survey design to examine the effect of mobile phone-based digital technologies and the performance of refugee women-led MSMEs in Kakuma Refugee Camp. The study targeted fully licensed refugee women-owned businesses across all four sub-camps of Kakuma Refugee Camp. The targeted population was sampled using a stratified simple random sampling technique. A total of 111 enterprises were surveyed using a questionnaire.

Data analysis was conducted in line with the research objectives using SPSS (Statistical Package for the Social Sciences) software. The researcher conducted both descriptive and inferential statistics. Descriptive statistics, including frequencies and measures of central tendencies comprising mean and standard deviation, were generated to give summaries and describe the sample characteristics. In addition, inferential statistics comprising correlation and regression analyses were generated to test the study hypothesis and estimate the effect of mobile phone-based digital technology utilization on MSME performance.

Econometric equation

$$Y_i = \beta_0 + \beta_1 * MPBTU + \epsilon$$

Where:

Y_i= Performance of MSME

β₀= Constant Term

MPBTU= Mobile Phone-Based Technology Utilization

ε= Model's Error Term (Residuals)

IV. RESULTS & DISCUSSIONS

4.1 Response Rate

Out of one hundred and ninety-six questionnaires (196) issued, 111 were filled and returned representing 56.6% response rate

Table 1
Reliability Test

Variable	Cronbach alpha
Mobile phone based technology	.818

Source: Researcher's Pilot survey (2023)

Table 1 above showed that the variables under study achieved the recommended Cronbach's Alpha of greater than 0.7 thus 0.818. This was important for internal consistency of data (Mugenda & Mugenda, 2018).

Table 2
Business Location



	Frequency	Percent
Kakuma 1	16	14.4
Kakuma 2	39	35.1
Kakuma 3	20	18.1
Kakuma 4	36	32.4
Total	111	100.0

Source: Research Survey (2023)

The study findings in Table 2 showed that the majority of the respondents, 39 (35.1%), were from Kakuma 2, followed by Kakuma 4, thus 36 (32.4%), Kakuma 3 being 20 (18.1%), and lastly Kakuma 1 at 16 (14.4%). Even though the camps were evenly distributed, three camps were fairly represented, with Kakuma 1 showing a relatively low response.

4.2 Descriptive Statistics for the Study Variable

From Table 3, when respondents were asked about their utilization of mobile phone-based technology on performance, the results showed that 53 (47.7%) of respondents confirmed to a great extent, as did 43 (38.7%) to a very great extent, that off-line mobile money financial transactions were experienced through SMS, such as payments to suppliers, bills, or salaries. Regarding online mobile banking interaction with business banking partners, 52 (46.8%) to a great extent and 28 (25.2%) to a great extent. Offline interaction with clients and suppliers through mobile phones was agreed to be in existence to a great extent by 33 (29.7%) and 53 (47.7%) to a very great extent.

Table 3

Likert Scale on Mobile Phone Based Technology Utilization

Description	Not at All (%)	Little Extent (%)	Moderately (%)	Greatly (%)	Very Greatly (%)
Off-line Mobile money financial transactions via SMS such as payments to suppliers, bills, or salaries?	0 (0)	1 (0.9)	14 (12.6)	53 (47.7)	43 (38.7)
Offline/Online Mobile Banking to interact with your business banking partner	2 (1.8)	4 (3.6)	25 (22.5)	28 (25.2)	52 (46.8)
Offline interaction with clients and suppliers through mobile phone (Calling/SMS) to share and receive business-related information	0 (0)	11 (9.9)	14 (12.6)	33 (29.7)	53 (47.7)

N=111

Based on the study findings in Table 4 below, enterprise’s average monthly income from sales was confirmed to have increased compared to the past 12 months to a great extent by 42(37.8%) and a very great extent by 15 (13.5%). The enterprise’s average monthly profit from sale was stated to have increased to a great extend compared to the past 12 months by 34(30.6%) and to a very great extent by 23 (20.7%). Furthermore, the enterprise’s average monthly sales were confirmed to have increased by a great extend as compared to the past 12 months by 37(33.3%), while another 8 (7.2%) to a very great extent. Women enterprise’s average number of employees had stabilized compared to the past 12 months as agreed by 42(37.8%) and even of very great extent by another 27 (24.3%). The enterprise’s average number of new customers per month had increased to a great extent compared to the past 12 months as confirmed by 63 (56.4%) and some 23 (20.7%) more saying it was to a very great extent. Likewise, the enterprise’s average number of referred customers per month was confirmed to have stabilized to a great extent 26 (23.4%) and to a very great extent by 48 (43.2%). It was also attested that the average number of complaints had reduced moderately by 36 (32.6%) while 32 (28.8%) thought it had reduced to a great extent and 26 (23.4%) saying it had reduced to a very great extent. It was therefore noted that among the Women led MSME’s in Kakuma refugee camp interviewed, 51.3% confirmed that either their profits or income from sales had increased to a great or very great extent, while 40.5% confirmed that sales had increased. It was also noted 77.1% and 66.6% had new customers or referred customer respectively, increase greatly or very greatly. The number of complaints was also seemed to have reduced greatly or very greatly by 52.2%. Therefore, it is worth noting that most parameters of performance including income, sales, number of employees and customer retention and referral had increased for Women led MSMEs that had embraced the utilization of Mobile phone-based Technologies in the businesses.



Table 4
Likert Scale on Performance

Description	Not at All (%)	Little Extent (%)	Moderately (%)	Greatly (%)	Very Greatly (%)
My enterprise’s average monthly income from sales has increased compared to the past 12 months	0 (0)	6 (5.4)	48 (43.2)	42 (37.8)	15 (13.5)
My enterprise’s average monthly profit from sale has increased compared to the past 12 months	1 (0.9)	16 (14.4)	37 (33.3)	34 (30.6)	23 (20.7)
My enterprise’s average monthly sales have increased compared to the past 12 months	0 (0)	35 (31.5)	31 (27.9)	37 (33.3)	8 (7.2)
My enterprise’s average number of employees has stabilized/increased compared to the past 12 months	0 (0)	9 (8.1)	33 (29.7)	42 (37.8)	27 (24.3)
My enterprise’s assets have increased compared to the past 12 months	1 (0.9)	4 (3.6)	31 (27.9)	50 (45)	25 (22.5)
My enterprise’s average number of repurchasing customers per month has stabilized/increased compared to the past 12 months	0 (0)	6 (5.4)	29 (26.1)	48 (43.2)	28 (25.2)
My enterprise’s average number of new customers per month has stabilized/increased compared to the past 12 months	0 (0)	17 (15.3)	8 (7.2)	63 (56.4)	23 (20.7)
My enterprise’s average number of referred customers per month has stabilized/increased compared to the past 12 months	0 (0)	2 (1.8)	35 (31.5)	26 (23.4)	48 (43.2)
My enterprise’s average number of customer/supplier complaints per month has significantly reduced compared to the past 12 months	1 (0.9)	16 (14.4)	36 (32.4)	32 (28.8)	26 (23.4)

N=111

The results in Table 5 below indicate that at the 0.05 level of significance, mobile phone-based technologies were a significant predictor of performance ($r = 0.501$, $p\text{-value} = 0.000 < 0.05$). This means that an increase in mobile phone-based technologies leads to an increase in performance. This study agrees with Esselaar *et al.* (2018), who found that mobile-phone-based ICT has a significant impact on profitability for informal MSMEs. However, the study disagrees with Makee *et al.* (2019), who found that the utilization of mobile phone transfer services was insignificant to enterprise performance.

Table 5
Pearson Correlation Matrix of the study variables

		Mobile phone based technologies	Performance
Mobile phone based technologies	Pearson Correlation	1	.501**
	Sig. (2-tailed)		.000
	N	111	111
Performance	Pearson Correlation	.501**	1
	Sig. (2-tailed)	.000	
	N	111	111
**. Correlation is significant at the 0.01 level (2-tailed).			
*. Correlation is significant at the 0.05 level (2-tailed).			

4.3 Regression Analysis

H_{01} : *There is no significant positive association between utilizing mobile phone-based digital technologies and Refugee Women-Led MSMEs performance in Kakuma Camp.*



The findings of the hypothesis test were presented below:

Table 6
Model Summary

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate			
1	.501 ^a	.247	.240	.35969			
a. Predictors: (Constant), Mobile phone based technologies							
ANOVA ^b							
Model		Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	4.618	1	4.618	35.696	.000 ^a	
	Residual	14.102	109	.129			
	Total	18.720	110				
a. Predictors: (Constant), Mobile phone based technologies							
b. Dependent Variable: Performance							
Coefficients ^a							
Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	2.738	.190			14.432	.000
	Mobile phone based technologies	.267	.045	.501		5.975	.000
a. Dependent Variable: Performance							

The results in Table 8 above show that the R-square was 0.247, implying that the variation in performance of 24.7% among MSMEs in Kakuma Refugee Camp was explained by mobile phone-based technologies. At the 0.05 level of significance, the ANOVA test indicated that mobile phone-based technologies were important in predicting performance among MSMEs in Kakuma Refugee Camp, as indicated by the significance value of 0.000, which was less than the 0.05 level of significance ($p = 0.000 < 0.05$). Thus, mobile phone-based technologies had a significant association with performance among MSMEs in Kakuma Refugee Camp (t -statistic = 14.432, p -value = $0.000 < 0.05$). The null hypothesis was rejected, and the alternative hypothesis—that mobile phone-based digital technologies have a significant effect on MSMEs performance in Kakuma Camp—was not rejected. There is a significant positive association between utilizing mobile phone-based technologies and refugee women-led MSMEs performance in Kakuma Camp by 0.267. The regression model equation was:

$$Y = 2.738 + 0.267X$$

This study agrees with Esselaar *et al.*, (2018) who found that mobile-phone based ICT has significant impact on profitability for informal MSMEs. However, the study disagrees with Makee *et al.*, (2019) who found that the utilization of mobile phone transfer services was insignificant on enterprise performance.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Mobile phone-based technology utilization is commonly practiced, with up to 86.4% of respondents using off-line mobile money for financial transactions to a great extent or very great extent. The study also found that 72% utilize to a great or very great extent online mobile banking interaction with business banking partners, while offline interaction with clients and suppliers through mobile phones was confirmed to a great or very great extent by 77.4% of the respondents. This confirms that the majority of the MSMEs in Kakuma embrace the utilization of mobile phone-based technology in their businesses.

There is also a significant positive association between utilizing mobile phone-based technologies and refugee women-led MSMEs performance in Kakuma Camp, with a variation in performance of about 24.7% among MSMEs

in Kakuma Refugee Camp explained by mobile phone-based technologies. This confirms that mobile phone-based technology is a significant predictor of performance since the utilization of mobile phone-based technology led to an increase in sales and profits among women business refugees in Kakuma camp.

5.2 Recommendations

Based on the results and conclusions above, the study recommends that the utilization of mobile phone-based technology should be encouraged, prioritized, and supported among refugee women-led enterprises since it leads to an improvement in the performance of a firm. This is based on the finding that most parameters of performance, including income, sales, number of employees, and customer retention and referral, which had a direct correlation with the utilization of mobile phone-based technologies, had increased. The study also recommends that comparative studies need to be done to see how significantly the same applies to male-led enterprises in Kakuma refugee camps and if similar findings could be established in other refugee settings, as this remains a gap in research.

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