

THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY ON PROFITABILITY OF SMALL AND MEDIUM ENTERPRISES: CASE OF NAIROBI CITY COUNTY

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ABSTRACT

Small businesses in Kenya have embraced the application of technological advances in communication and information to enhance their performance and profitability in the current challenging business environment. This was particularly exacerbated by the Covid-19 pandemic that forced them adopt to the new technological advancements in order to stay afloat. However, the effect of technological innovation regarding the profitability of premises is still understudied in Kenya with reference to Kasarani sub-county in Nairobi County. The research especially looks to investigate the impact of data and conversation modern advances on the success of minor and medium-sized businesses in Nairobi City County.; to assess the role of Information Communication Technology on the quality of products and services of Small and Medium Enterprises in Kasarani Sub-County; and to determine the duty of information and Communication Technology on efficiency of Small and Medium Enterprises in Nairobi City County. The study is grounded on two theories, that is the unified hypothesis of adoption and utilization of modern advances theory and the diffusion of technology hypothesis. The research employed the methodology of an informative study, for this study, it aimed demography of owners and managers of all registered Small and medium-sized businesses with reference to Kasarani sub-county in Nairobi County, who total 2,136 as per the Nairobi County Government. The researcher computed the desired sample using the Yamane equation to get the desired sample size. This formula gives a sample size

of 96 owners/managers of businesses, from a directory attributed to all licensed SMEs, who will be chosen in Kasarani sub-county in Nairobi County, by simple random sampling technique. Primary data was used in this investigation, which was quantitative in nature and obtained using structured questionnaires. Preliminary research was conducted before the core investigation. The test is performed to evaluate the precision and dependability of the investigation's equipment. Participants' responses were enumerated based on a five-point Likert scale. The drop and pick technique were then employed in questionnaire administration in the main study, whereby respondents were given a week to respond. After collection of the data, the study assessed the questionnaires for completeness after which coding and entry of the data followed. Data analysis was then conducted utilizing version 27 of the Statistical Processing System for the Social Sciences. Both inferential and descriptive analyses were utilized in this regard. Results indicate that that information and Communication Technology and profitability has a significant effect on SME performance ($\beta = .813$, Sig. = $.015 < .05$). In conclusion, the findings highlight the potential of information and communication technology to drive financial gains elevate product standards, streamline operations, and emphasize the need for supportive policies and practices to foster technology adoption and enhance SME success.

Keywords: Information and Communication Technology, Profitability and SMEs

INTRODUCTION

Human advancements in recent decades have been accompanied by increasing technological changes and the rapid proliferation of digitized devices and services. The rate at which these changes are taking place is accelerating as a result of new inventions in technology including big data evaluation, artificial intelligence (AI), and cryptocurrency, biotechnology, nanotechnology, and robotics, among many others. SMEs have struggled to operate in an economy where they rely entirely on manual input from individuals. Glitches and insufficient information backup are among the challenges they face, due to lack of information technology skills and lately inefficiencies in their operations. Most of these challenges have been solved through utilizing technological innovations in everyday life. This has greatly helped in improving the performance of SMEs and increased their production. The incorporation of Modern advances integrating data as well as conversation into their operations has solved the majority of these challenges.

Technology's impact on businesses' performances is reported globally, regionally and in the Kenyan context. In the Ibero-American region of Spain, Colombia and Chile, SMEs with enhanced ICT capabilities have been reported to record at least 30 percent greater diversity in their product and service offerings as compared to SMEs with less ICT capabilities (Gaviria-Marin et al., 2021). Further findings from a research investigation using information collected by 1,238 small technological businesses spread across 25 European Union member nations, enterprises that implemented perpetual technology creativity initiatives saw greater employment progress, greater earnings, and improved market changes. Compared to businesses that only occasionally innovated, those who pursued ongoing ICT innovation tactics saw more job development greater profits, and improved sales characteristics (Martinez-Conesa et al., 2020).

Businesses in Kenya constitute an important generator of income for the government (Wanjohi, 2010). It's done so that authorities can operate numerous tax-collection stations in order to guarantee a steady supply of funds. A considerable number of SMEs in the country are reported to have increasingly adopted ICTs in the wake of COVID-19 (Omulo, 2020). It however remains unexplored, how this adoption has influenced their performance, hence the present study. SMEs today exist in an unstable environment characterized by constant changes. For them to remain relevant and competitive, they must be as dynamic as the environment they exist. ICT is the main accelerator associated to modifications regarding commercial surroundings. Ghobakhloo, Hong, Sabouri and Zulkifli, (2012), conducted a study in Italy and found out that for SMEs to survive in the field dominated by industry players, they must embrace, implement and maximize the use of ICT as bedrock in their daily operations.

SMEs are embracing ICT more and more as a result of the introduction of private systems, reduction in costs of ICT products and cost effectiveness. ICT gives a business a competitive advantage as the The World Wide Web offers more than one opportunity to equally compete

against established corporations (Chairoel, 2015). The adoption of ICT in SMEs improves communication, improves the quality of services offered, enhances productivity, it helps embrace a new organizational and managerial model in an organization, improves the efficiency of human resources and gives the business access to new markets (Barba *et al*, 2007).

Nairobi City County is Kenya's third smallest and most densely populated county (Omulo, 2020). According to the 2019 national census survey by the Kenya National Bureau of Statistics (KNBS) (2019), there were a total of 4,397,073 residents in Nairobi City County living inside the city limits. The County hosts the highest proportion of SMEs in the country (60%), making it the most suitable for the study owing to its representativeness of the diverse SMEs in the country (Omulo, 2020). It has a total of seventeen Sub-Counties, with the most populated being Kasarani. Kasarani Sub-County covers an area of 152.60km² making it the second largest constituency after Lang'ata. Kasarani Constituency forms part of two sub-counties; Kasarani Sub-County and Njiru Sub-County. Kasarani sub-county was purposively selected for this study because it has both urban and peri-urban areas with high number of SMEs. The sub-county is one of the most populated sub-counties in Nairobi County. Kasarani sub-county include the municipalities of Kasarani, Mwiki, Clay City, Njiru, and Ruai which account for 839 SMEs, majority of them run by lone entrepreneurs. The jua kali sector, cement production, brickwork production, and the clothing sectors constitute other growing SMEs in the sub-county. According to a 2016 poll, medium-sized businesses can employ between 51 and 99 people. Additionally, it demonstrated that there are 156 million MSMEs that are licensed by different county governments and 5.85 million MSMEs operating unlicensed.

Kasarani sub-county is faced by different difficulties which prevent SMEs around the area from expanding. It is challenging for companies to establish themselves on their own in due to the prevalence of concept duplication within SMEs in the surrounding region. As a result, the market is saturated by equivalent goods, which drives down pricing on products and eventually causes business closures due to intense rivalry. The Kasarani sub-county's SMEs usually lack knowledge of their sector and customers. They don't carry out thorough market studies to identify deficiencies in the market to keep up with the ever-changing customer needs. This study will help SMEs in Kasarani sub-County understand what it means incorporating technology at workplace and how ICT has helped other businesses thrive in the region.

LITERATURE REVIEW

Theoretical Review

Unified Theory of Acceptance and Use of Technology (UTAUT)

Various technology instruments are used in business nowadays, this includes computers, social media, mobile money platforms, Wi-Fi, the internet, and smartphones, among others. Six elements

make up the Unified Theory of Acceptance of use of Technology advanced by Venkatesh et al. (2003). Performance Expectancy is the first element (PE), it highlights the advantages that technology users anticipate to obtain, such as cost savings, time savings, and service effectiveness. The effort expectation is the second component of UTAUT (EE). This reflects the level of comfort with which customers use technology. The social influence is the third component (SI). This is the social pressure that an individual experience from their immediate surroundings, which may have an impact on their behavior and perceptions of engaging in certain activities. Perceived Credibility (PC), the fourth element, shows how security and trust affect users' willingness to utilize a specific technology. The fifth component, called Task Technology Fit (TTF), argues that a technology must be able to meet users' needs in order for them to accept its use. The Facilitating Conditions make up the sixth component (FC). This is the degree to which a person thinks that a technical and organizational framework is in place to facilitate the usage of a technology. Understanding how new enterprises and startups choose their ICT tools is made easier by the theory.

While the UTAUT has been extensively used and cited in research, it is not without its critiques. One criticism of the UTAUT is its limited consideration of contextual factors that may influence technology acceptance. The model primarily focuses on individual beliefs and intentions, neglecting important organizational, cultural, and environmental factors that can shape technology adoption. This limitation makes it challenging to apply the model across diverse settings and cultures (Manochehri et al., 2012). The UTAUT has also been critiqued for assuming a static view of technology adoption, treating it as a one-time decision-making process. However, technology adoption is often an ongoing and evolving process, influenced by various factors over time. The model does not account for changes in user attitudes, motivations, or external variables which could impact extended technology adoption as well as application (Ismail et al., 2011).

In the present study, UTAUT helps understand the factors influencing SMEs' acceptance and adoption of ICT. It identifies important variables including performance expectations, effort expectations, interpersonal impact, and enabling circumstances. By examining these factors, the study can assess the likelihood of SMEs adopting ICT and the extent to which it aligns with their performance goals.

Empirical Literature

ICT and Profitability of SMEs

Lately, academic study has increasingly become more focused on data and interpersonal interaction technologies and how they affect societal along with monetary spheres. The need to capitalize on and take advantage of the beneficial impacts of ICT implementation and adoption in different companies has been shown by both empirical and theoretical research (productivity growth, organizational development, effectiveness, efficiency, and competitiveness). This section

reviews the research on the possible direct as well as indirect impact of ICT on the operations of SMEs in order to pinpoint those factors that might affect the success of a business (Njoroge, 2020). Alam and Noor (2009) observed three major elements which prevented technology implementation in Malaysia, the factors were an inadequate level of ICT knowledge, inadequate resources and lack of federal assistance. Zero understanding, ignorance of the modern advancements and their suppliers, and the belief that information and communications technology is too costly were some of the elements which hindered by use of ICT Ismail *et al* (2011). According to Nduati *et al* (2015), some of these factors are similar to what is hindering implementation of ICT in companies in Kenya. They observed that low level of ICT skills, no assistance given by the administration, excessive prices of computers, steep price of internet connection and high prices of computers made it hard for businesses to implement technology. In Nigeria, the reason behind limited use of ICT are inadequate infrastructure and electricity in the country.

Businesses were essential for a country's financial system expansion (Gilaninia *et al.*, 2012). The effectiveness of a process is gauged by its performance. According to Ankrah and Mensah, a measure of "The manner in which it is administered" and "the value it generates for customers and other stakeholders" are the two factors that determine the efficacy of a business. (2015). ICT is one of the motivators for reaching the performance and values in SMEs. ICT has an effect on how businesses are run and is thought to be crucial for the expansion and survival of a country's economy. ICT means an array of computerized information and communication technologies, as defined by Rafi and Muhammad (2008). These include items and services like desktop and laptop computers, mobile phones, wireless internet, handheld devices, and business-oriented applications like spreadsheets, business applications that help in keeping data safe. These products facilitate the effective running of enterprise operations as well as data accessibility.

Noor and Alarm (2009) observed that implementation of technology is considered a means to enable businesses to compete globally. Having increased effectiveness and proximity to suppliers as well as customer relationship. The adoption of ICT in businesses is therefore a necessary requirement for businesses viewing to use technology to give them an edge against competitors in commerce and industry. According to Manochehri, Al-Esmail, and Ashrafi's (2012) observations, three requirements must be met in order to gain from ICT adoption, provide improved services and discover fresh possibilities for business; there should be specific adequate facilities, technology savvy staff along with funding.

Muneta (2012) confirmed the same conditions for the operation of ICT in businesses. He stated that prior the written word's analysis of the implementation of ICT variables may be divided into three categories: those linked to the personnel who would make use of ICT, those associated with the firm's features and those linked to the surroundings that that the business works in. The study participants concluded that implementation of ICT also requires funding from the government, as

well as ICT expertise and skills. Omari, (2020) investigated the impact of adopting technology on the execution of enterprises in Nairobi County, Kenya. It had been observed that ICT has helped SMEs in Nairobi County grow in business in terms of access to new markets, volume of production, volume of sales and provided a platform where businesses have the capacity to undertake greater volume of work. It was also established that ICT generated higher-quality goods as well as amenities as an attribute to increasing consumer satisfaction and creating room for innovation through introduction of new products and services. The study establishes that ICT has increased efficiency in SMEs through; access to new potential markets, growth in sales, better supply chain, enhance connection to new partners, immense organizational expansion, improved communication, improved the quality of products and services and reduced transportation cost. The research recommended that SMEs leadership should try to find technological innovations which might enhance the provision of services, effectiveness, including the selection of products that best meet consumer needs, do a survey of the environment. The supervisors should also take into consideration the adoption of various ICT equipment to be adept in their different fields.

RESEARCH METHODOLOGY

In the present investigation, a method based on descriptors shall be used, as clarified according to Saunders et al. (2016) as including fact-finding inquiries using surveys of various types. According to *Collis* and *Hussey* (2013), giving a description of the existing situation is the main objective of descriptive research. Therefore, the descriptive survey methodology allowed the investigator to provide a precise description of the role of ICT on performance of small and medium enterprises with reference to Kasarani sub-county in Nairobi County.

For this research the aimed demography involves owners/managers of all registered small and medium enterprises with reference to Kasarani sub-county in Nairobi County, who total 2,136 as per the Nairobi County Government (2022). The researcher computed the desired sample using the Yamane (1967) equation to get the desired sample size which gave a sample size of 96 owners/managers of SMEs, whom were chosen out of certain listings that included every established small to medium-sized enterprises in Kasarani sub-county in Nairobi County, by simple random sampling technique.

Primary data was used in this investigation, which was quantitative in nature and obtained using structured questionnaires. The questionnaire is deemed desirable in this study as it confines responses within a set of predetermined set of questions aimed at directly addressing the study objectives (Saunders et al., 2016).

Data analysis was then analyzed using edition 26 of the Statistical Packages for Social Sciences (SPSS). Both inferential and descriptive analyses were utilized in this regard. Descriptive analysis involve means, frequency counts, and percentages.

RESULTS AND FINDINGS

ICT and Profitability

Table 2: ICT and Profitability

	Mean	Standard Dev
Use of ICT has reduced our exposure to risks	4.247	0.434
Use of ICT has resulted in new revenue channels for our business	4.071	0.258
Use of ICT has enabled our business to reach out to new and potential markets with ease	4.071	0.371
Use of ICT has enabled our business streamline internal processes and workflows for higher profit margins	4.212	0.411
Use of ICT has resulted in increased levels of innovation in our provision of goods and services for higher profit margins	3.929	0.530
We have experienced improved profitability with the adoption of ICT	4.178	0.389
Overall	4.118	0.399

Source: Survey Data (2023)

An aggregate average of 4.118 was determined, as shown in Table 2, indicating that most responders affirmed to ICT enhancing profitability in their respective businesses. A majority particularly highly affirmed that use of ICT has reduced their exposure to risks ($\bar{x}=4.247$; $\sigma=0.434$); use of ICT has enabled their business streamline internal processes and workflows for higher profit margins ($\bar{x}=4.212$; $\sigma=0.411$); they have experienced improved profitability with the adoption of ICT ($\bar{x}=4.178$; $\sigma=0.389$); use of ICT has resulted in new revenue channels for their business ($\bar{x}=4.071$; $\sigma=0.258$); use of ICT has enabled their business to reach out to new and potential markets with ease ($\bar{x}=4.071$; $\sigma=0.371$); and that ICT has resulted in increased levels of innovation in our provision of goods and services for higher profit margins ($\bar{x}=3.929$; $\sigma=0.530$). The overall standard deviation of 0.399 indicates the degree of variation or spread in the responses. The low standard deviation suggests that there is relatively little variability in respondents' views about the impact of ICT on profitability. Most respondents seem to strongly agree that ICT enhances profitability.

The outcomes demonstrate that the bulk of responders believe that ICT positively contributes to enhancing the quality of their SME products. This suggests that business owners or managers in the study area perceive technology adoption as a means to improve the quality of their products. The finding aligns with the idea that technology can enhance product quality by enabling better monitoring and control over production processes, facilitating precision and consistency, and ensuring compliance with industry standards. Automation, data analytics, and real-time monitoring are examples of how ICT can contribute to better product quality. Improved product quality can be a strong competitive advantage for SMEs. Positive customer experiences due to high-quality products can lead to customer loyalty, positive word-of-mouth, and potentially increased market share.

The findings agree with Lloyd and Kroeze (2008) observed that ICT helps to eliminate barriers to market entry which opens the business to a wide customer base. It promotes borderless market and enhances knowledge to easily provide clients with products and amenities. The outcomes also concur with a 2012 study by Bonsu and Sampong on the effect of technology on SMEs in Kumasi. Ghana noted that few SMEs around Kumasi were conscious of the advantages of implementing ICT. Instead of looking for ingredients, the majority of businesses that used the internet did so to find clients and agreements, gather business-related data, and send emails. The majority of SMEs observed successful operations and other advantages as a result of integrating ICT into their operations.

Regression Analysis

The study proceeded to conduct a simple regression analysis, modelling the relationship between the predictors, that is profitability of SMEs and the recipient variable SME performance. The outputs were generated: the model fitting brief, ANOVA, and the calculated model fit table. Table 4.8 displays an overview of how well the model fits.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820 ^a	.673	.660	.74486

a. Predictors: (Constant), ICT and Profitability

The output in Table 4.8 revealed a 0.820 correlation value (R), modeling a strong, linear connection between ICT and Profitability SME performance. An R² value of .673 was also observed, implying that ICT and Profitability accounts for 67.3% of SME performance and the remaining 32.7% is attributed to additional characteristics that the predictive model used in this study did not consider. An ANOVA test was also generated as seen in the multivariate equation in Table 4.9.

Table 4.9: ANOVA

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92.283	3	30.761	55.443	.000 ^b
	Residual	44.941	81	.555		
	Total	137.224	84			

a. Dependent Variable: SME performance

b. Predictors: (Constant), ICT and Profitability, ICT and Quality of SMEs products and ICT and Efficiency of SMEs

Results of the ANOVA analysis, as shown in Table 4.9 demonstrate that the technique of regression used in the investigation was substantial ($F = 55.443$, $Sig. < 0.05$). The results show that predicated on the total squared sum (137.224), the sum of the regression squares was 92.283. This indicates that the regression model explains about 67.3% of the variation in the dataset, while the total of the remaining squares is 44.941 implying that 32.7% of the variance in the database is unexplained for. Regressing evaluation also yielded a table of regression values, which is shown in Table 4.10.

Table 4.10: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.009	1.466		1.370	.174
	ICT and Profitability	.688	.276	.813	2.495	.015

a. Dependent Variable: SME Performance

Table 4.10's findings, which statistically account for the remaining predictor factors, illustrate the anticipated effect of every factor that predicts on SME performance. The .813 factor of regression ($Sig. = .015 < .05$) in ICT and profitability means that for every 1% change in ICT and profitability, there was a correlated .015% change in SME performance, keeping other factors constant. This was also significant, implying that ICT and profitability has a significant effect on SME performance.

The study's findings clearly indicate that SMEs in Kasarani Sub-County can significantly improve their profitability by adopting ICT solutions. This underscores the importance of technology in streamlining business processes, reducing operational costs, and enhancing overall efficiency.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study set out to examine the use of ICT on profitability of SMEs in Nairobi City County. The established overall mean suggests a consensus among respondents that integrating technology into their businesses enhances financial outcomes. Furthermore, the statistically significant relationship between ICT adoption and profitability underscores the importance of technological integration in SME operations. These findings provide valuable insights for SMEs, policymakers, and stakeholders interested in fostering economic growth through technology adoption in the region.

This investigation attempted to assess the use of Information Communication Technology on the profitability of SMEs in Kasarani Sub-County. It can be deduced that a substantial majority of

respondents believe that technology positively contributes to product quality. The study's discovery of a significant effect between ICT and product quality on SME performance reinforces the idea that technology adoption can lead to better customer satisfaction and competitive advantage. This insight serves as a guide for local businesses and policymakers seeking to leverage technology to elevate product quality standards and overall business success.

Recommendations

Informed by the study findings and subsequent conclusions draw, it is recommended that government and relevant agencies should establish programs to assist SMEs in acquiring and implementing ICT solutions. This could include providing subsidies for technology adoption, offering training programs, and facilitating access to relevant resources. Develop training initiatives that equip SME owners and employees with the necessary digital skills to effectively use technology tools. This can empower them to harness the full potential of ICT for profitability, quality improvement, and efficiency.

Furtherer, SMEs should conduct thorough assessments of their technological needs and develop comprehensive plans for adopting and integrating relevant ICT tools into their operations. Encourage SMEs to collaborate and share experiences related to successful ICT implementation. This can be facilitated through industry associations, workshops, and seminars. Implement a culture of continuous learning within SMEs, where employees regularly update their digital skills to keep up with evolving technologies.

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