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Small-scale Enterprises Performance and Economic Growth in Kumasi Metropolis, Ghana: Mediating Role of Technology

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Abstract

The purpose of this research was to find out how Small and Medium Enterprises (SMEs) in the Kumasi Metropolis performed in relation to technology practices. Moreover, the research sought to explore the potential mediating effects of technology intricate dynamics unveils a significant impact on the correlation between SME performance and economic growth. Employing a quantitative research design, data were diligently gathered, analyzed, and interpreted utilizing quantitative methodologies. The study involved participants from SMEs, encompassing both owners/managers and other staff members. To ascertain the internal coherence of the questionnaire used for the study, Cronbach's Alfa test was used to found that, the items used were reliable (Cronbach Alpha coefficients were above 0.70). The investigation of the mediating roles of technology involved the application of a Hayes

process macro version 3.5.3. The findings underscored a noteworthy discovery. To ascertain the relationship between technology practices on SMEs performance, regression model, ANOVA and coefficient of variables were used. The results demonstrated a substantial positive correlation with technology practice on SMEs' performance. Emphasizing the applicability of technology's impact on SME performance across various enterprises is pivotal in enhancing SME performance which leads to economic growth and development. The research recommended that businesses are encouraged to strategically integrate technology into their operations processes to foster a culture that embraces adaptability and innovation for economic growth development. Again, Governments and relevant stakeholders are encouraged to design and implement support programs specifically tailored for SMEs. These include advanced technological training, digital recruitment, financial assistance, capacity-building initiatives, and policy frameworks that create an enabling environment for technological development.

Keywords: SMEs' performance, Technology adoption, Economic growth, Kumasi - Ghana

1. Introduction

Innovation, high-quality products, effective operations, and excellent customer service are indicators of SMEs' performance and success. Additionally, according to Radzi et al. (2017), technology impacts how well SMEs accomplish their corporate objectives. Technology and financial resources are two of the fundamental issues that SMEs face while trying to grow. Technology is crucial since it can guarantee that the company will turn a profit. Innovations are necessary to compete in a competitive market, and technology plays a critical role in improving the operations of SMEs.

Micro, Small and Medium Enterprises (MSMEs) are often described as the primary drivers of economic growth from the standpoint of innovation and job creation. The United Nations approximates that MSMEs constitute 90 percent of businesses worldwide and contribute 60 to 70 percent of global employment. MSMEs are the largest employers in many middle- and low-income countries like Ghana. This notwithstanding, their sustainability can be threatened by insufficient technological practices. Per their numbers and commitment towards job creation, MSMEs are key sustainable instruments for developing economies in various countries.

Authors have presented varied definitions of MSMEs, with the most commonly employed criterion being the firm's workforce size. Yet, this standardization often leads to confusion due to differing thresholds and classifications used by various official sources. For instance, according to the Industrial Statistics provided by The Ghana Statistical Service (G.S.S), Small-Scale Enterprises are those with fewer than ten (10) workers, while Medium and Large-Sized Enterprises are those with more than ten (10) workers.

Another metric employed to define MSMEs is the assessment of fixed assets within the business. However, the National Board of Small-Scale Industries (N.B.S.S.I) in Ghana adopts a dual criterion, considering both fixed assets and the number of workers. According to their classification, an MSME comprises no more than nine (9) workers. It possesses plant and

machinery (excluding land, buildings, and vehicles) valued at no more than ten million Ghana cedis.

Steel and Webster (2012), Osei *et al.* (2013) in characterizing MSMEs in Ghana utilized a work cut off point of thirty (30) representatives to show MSMEs. This assertion is further dis-aggregated MSMEs into three (3) classifications:

(i) Micro- utilizing under six (6) workers.

(ii) exceptionally Small, those utilizing six (6) to nine (9) workers.

(iii) Small and Medium- between ten (10) and (29) representatives.

The decision to set up MSMEs within the various sectors of the economy depends on the following recommendations:

(i) Mobilize reserves that in any case would have remained idle.

(ii) Are considered as a seedbed for local business.

(iii) Are work escalated, utilizing more work per unit of capital compared to huge ventures.

(iv) Encourage local technological ability.

(v) Promote competition (yet behind defensive obstructions).

(vi) Make use of local resources to reduce the need for international trade.

(vii) Attend to the needs of the underprivileged.

(viii) Adjust effectively to client prerequisites (adaptable expertise).

Small and Medium-sized Enterprises (SMEs) are vital contributors to the economic growth of numerous countries globally. They provide employment opportunities, contribute to innovation and technological advancement, and promote competition and entrepreneurship (Ayyagari, Beck, & Demirgüç-Kunt, 2007; Kim & Park, 2017). Hence, the sustainability and effectiveness of SMEs hinge on their ability to innovate technologically.

The International Labor Organization (1999) delineated SMEs as enterprises employing a workforce ranging from 11 to 50 individuals. Thriving in business necessitates a commitment to technological innovation. While in the past, the adoption of new technologies has sometimes led to concerns about job displacement, there is now a growing recognition of technological innovation's potential to drive economic development and growth. Policymakers acknowledge SMEs' pivotal role in attracting, retaining, and nurturing talent, aligning skills and competencies with organizational objectives, and fostering a conducive work environment that enhances productivity and innovation (Hulage, 2024).

Hence, this research aims to explore the correlation between technology adoption and SME performance in Ghana. By offering empirical insights from a developing nation context marked by high inflation rates and diverse regional business landscapes, this study seeks to enrich the existing literature on the interplay between technology and SME performance.

Socioeconomic contributions by SMEs to the Ghanaian economy's growth.

Find below details on the socioeconomic contributions made by SMEs to the Ghanaian economy's growth process.

Encouragement of local entrepreneurship

Encouraging local entrepreneurship through small and medium-scale industries fosters economic growth and nurtures innovation and technological advancement within communities. By providing a platform for budding entrepreneurs to manifest their latent ambitions, SMEs serve as catalysts for disseminating locally and globally inspired creative ideas. Moreover, their emphasis on labour-intensive practices generates employment and promotes efficient capital utilization, making them vital contributors to job creation and sustainable development.

SMEs helps in Distribution of Wealth

They achieve this by providing numerous rural and urban dwellers with paid employment or avenues for profitable economic activities. Simultaneously, they supplement the income of individuals with regular jobs. Small businesses contribute significantly to narrowing economic disparities and facilitating the redistribution of wealth, thereby fostering greater financial inclusivity and opportunity.

Utilization of Local Resources.

Small-scale industries are notable for their extensive reliance on local resources, surpassing that of larger enterprises. They utilize local raw materials and repurpose discarded by-products from larger firms or primary outputs in their production processes. Moreover, they provide employment opportunities for individuals with limited formal training or education, thereby maximizing the utilization of local talent and fostering community resilience and sustainability.

Dispersal of Economic Activities

Small-scale businesses represent an economic sector characterized by accessible entry for aspiring entrepreneurs, with minimal capital requirements and independence from substantial economies of scale in production and marketing for establishment and sustainability.

Mobilization of Savings

Additionally, small and medium-scale industries are crucial in mobilizing idle financial resources that might otherwise remain outside the banking system, facilitating broader financial inclusion and utilization.

Changes in the Indigenous industry

The driving force behind this transformation has frequently been small-scale enterprises, particularly household or artisan industries, evolving into larger firms as their owners' skills enhance and their operational scale expands.

1.1 Problem of the Study

The study's problem arises from a gap in existing literature concerning the correlation between modern technological practices and the performance of SMEs in Ghana. While some research has explored this link in general, there is a shortage of studies focusing specifically on SMEs in Ghana. Notably, small and medium enterprises in the Kumasi Metro area, encompassing the service and manufacturing sectors, encounter numerous performance hurdles, as noted by Viju Raghupathi and Wullianallur Raghupathi (2019). Many of these enterprises employ individuals with limited technological proficiency, as highlighted in Sudi's (2013) findings, where 61 percent of SMEs in Ghana need more computerized accounting systems. Consequently, these businesses need help maintaining market share, competitiveness, and profitability, often experiencing early collapse within the first year, with technology and innovation deficiencies cited as key contributors. Against this backdrop, the study aims to investigate how technology adoption and advancements impact the performance of small-scale enterprises in the Kumasi Metropolis.

There is, therefore, the need for a shift of focus to technological practices in SMEs. Given the scant understanding of technology's pivotal roles in small and burgeoning firms (Cardon and Steven, 2004), it is evident that one resource that is common to all organizations, irrespective of size, is technology; the specific business problem is some SME managers are not savvy technologically for business sustainability beyond five years. This study will help close this gap by establishing the causes for the limited application of technology and technological practices by SMEs and how technology can enhance the effectiveness and efficiency of SMEs.

1.2 Objectives of the Study

The objective of the study is to investigate the relationship between the performance of small-scale enterprises and economic growth in Ghana, focusing on the Kumasi Metropolis. Specifically, the study aims to:

- Examine the specific Technology practices that are associated with better firm performance in SMEs in the Kumasi Metropolis.
- Explore the Role of Technology in Enhancing in Ghanaian SMEs for economic growth and development.
- Provide recommendations for enhancing the effectiveness and efficiency of small-scale enterprises through the strategic application of technology, thereby contributing to overall economic growth in Ghana.

2. Literature Review

2.1 Overview of Small Medium Enterprises (SMEs) in Ghana

Small Scale Enterprises (SMEs) are independently owned and operated businesses that have fewer than 100 employees and a low volume of sales (UNCTAD, 2017). Within developing nations, SMEs emerge as pivotal engines of economic growth, spearheading the creation of job prospects, fostering income generation, and catalyzing innovation and market dynamism

through healthy competition. However, SMEs face several challenges that impede their growth and sustainability, including Technological advancement, limited access to finance, inadequate infrastructure, and lack of managerial and technical skills (UNCTAD, 2017).

During a webinar organized by Ecobank Ghana Limited on August 31, 2020, Kingsley Adofo-Addo, the Head of SME Banking at Ecobank Ghana, revealed that the Micro, Small, and Medium Enterprises (MSME) sector in Ghana encompasses over 2 million businesses. This sector, which constitutes 90% of all businesses in the country, plays a pivotal role in supplying essential goods and services, fostering job creation, poverty alleviation, and driving economic growth. Specifically, within Ghana's MSME landscape, 81% of enterprises fall within the micro-enterprises segment, employing between 1 to 10 individuals each. However, the adverse economic effects of the Covid-19 pandemic have disproportionately impacted MSMEs, both in terms of supply chain disruptions and reduced demand, undermining their crucial role as the linchpins of Ghana's economic resurgence.

2.2 Technology and Small Medium Enterprises Performance in Ghana

In the fast-paced global business environment, the role of technology in shaping the performance of Small and Medium-sized Enterprises (SMEs) has garnered significant attention. The adoption and integration of technology within SMEs have become key determinants of their competitiveness, efficiency, and overall success. This literature review explores the multifaceted relationship between technology and SME performance, drawing insights from empirical studies conducted across various industries and contexts (Raymond and Uwizeyemungu, 2017).

The adoption of technology within SMEs is intricately linked to improvements in operational efficiency which translates into cost savings and improved performance, positioning technology as a crucial asset for SMEs seeking operational excellence (Raymond and Uwizeyemungu, 2017).

Technological innovation emerges as a cornerstone for SMEs aiming to stay competitive in dynamic markets. Studies by Lee, Lee, and Pennings (2001) highlight that technology-driven innovation enhances SMEs' ability to respond to market changes, introduce new products or services, and differentiate themselves from competitors. This innovation-led competitiveness is particularly crucial for SMEs operating in industries characterized by rapid technological advancements (Raymond and Uwizeyemungu, 2017). The integration of CRM systems stands out as a significant technological intervention positively influencing SME performance. CRM systems enable SMEs to manage customer relationships effectively, leading to improved customer satisfaction and loyalty (Payne & Frow, 2005; Das, 2013). The advent of e-commerce technologies has expanded the market reach of SMEs beyond geographical boundaries. Research by Chong, Ooi, and Lin (2010) indicates that SMEs engaged in e-commerce experience increased market access, reaching a global customer base. The ability to tap into new markets contributes to revenue growth and heightens SME performance.

The emergence of financial technologies, commonly known as Fintech, has revolutionized how SMEs access capital. Platforms offering online lending and crowdfunding provide SMEs

with alternative financing options (Beck et al., 2018). This enhanced access to capital facilitates business expansion, research and development, and investments in technology, all of which contribute to improved SME performance.

While the benefits are evident, challenges in the adoption of technology within SMEs persist. Limited financial resources, lack of digital literacy among employees, and resistance to change are commonly cited challenges (Dwivedi et al., 2023). Addressing these challenges is essential for unlocking the full potential of technology and ensuring a positive impact on SME performance.

In conclusion, the literature reviewed underscores the transformative role of technology in shaping the performance landscape of SMEs. From enhancing operational efficiency and fostering innovation to facilitating global market reach and revolutionizing access to capital, technology emerges as a catalyst for growth and competitiveness (Raymond and Uwizeyemungu, 2017). However, understanding and addressing the challenges associated with technology adoption are crucial for SMEs to harness its full potential and thrive in an increasingly digital business environment. The empirical exploration of these dynamics within the specific context of SMEs in Ghana holds the potential to contribute valuable insights to augment the current reservoir of knowledge.

2.3 Empirical Literature Review

2.3.1 Exploring the Role of Technology Enhancing in Ghanaian SMEs

As technology continues to evolve, its integration within the SMEs domain becomes increasingly pertinent for organizational success. This empirical review synthesizes findings from relevant studies that have explored the impact of technology effectiveness within Small and Medium-sized Enterprises (SMEs) in Ghana.

2.3.2 Technological Training Initiatives

In their research, Rajashree K. Gethe1, Mahesh S. Hulage, (2024). explore the effect of technological training initiatives on within SMEs in India. The study reveals that SMEs providing technological training to SMEs staff witness improved competency in managing digital tools. Competent use of technology is linked to the efficient execution of business functions, contributing positively to overall SMEs effectiveness.

2.3.3 Digital Recruitment Strategies /Digital Business

A study conducted by Melanthiou, Y., Pavlou, F., & Constantinou, E. (2015), Nicholas Eveleigh (2023) delves into the realm of digital recruitment strategies in SMEs. Their findings indicate that SMEs utilizing online platforms for recruitment experience broader candidate pools and expedited hiring processes. The adoption of digital recruitment strategies is associated with enhanced talent acquisition, showcasing the significant impact of technology to promote economic growth and development.

2.3.4 Employee Engagement Platforms

Research carried out by Pawel Korzynski (2015) delved into the behaviours of managers and

directors within Fortune 500 companies in the United States. The findings reveal a positive association between employee engagement and several factors: the amount of time leaders invest in internal online networking platforms, adherence to an established code of conduct for online networking, and the presence of an open organizational culture. Moreover, the study underscores the influence organizations wield over leaders' utilization of online social networking platforms, emphasizing the role of an open culture and targeted training initiatives. Notably, effective communication by leaders, both internally and externally across various platforms, not only enhances their satisfaction but also amplifies productivity levels. The interactive nature of these platforms fosters a sense of community and inclusivity, contributing to overall SMEs effectiveness and efficiency.

2.3.5 Challenges of Technology Implementation

Acknowledging the nuances of technology adoption, Ansong and Owusu (2017) investigate the hurdles encountered by SMEs in Ghana during the implementation of technology. The study identifies issues such as resource constraints, resistance to change, and inadequate infrastructure (Ansong and Owusu, 2017). Understanding these challenges is crucial for devising strategies to overcome obstacles and maximize the benefits of technology to enhance SMEs in augmenting their production capacities, thereby catalyzing economic growth and development.

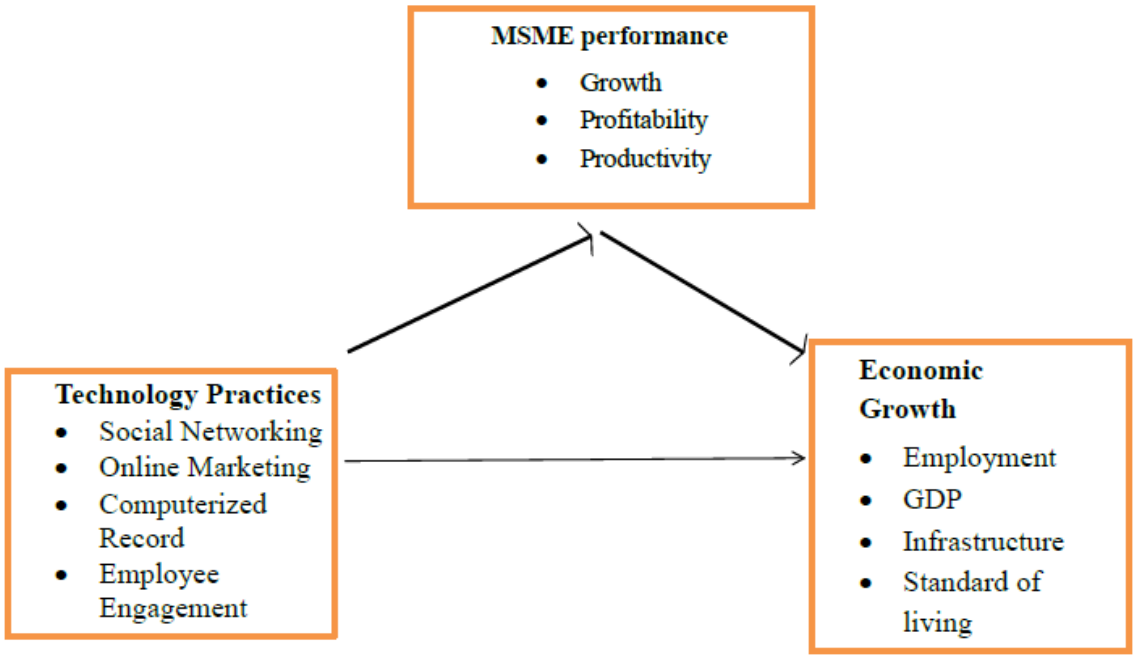

Figure 1. Conceptual Framework

Social Networking: Research indicates that SMEs leveraging the Internet for business activities enjoy significant profit margins (Jagongo & Kinyua, 2013; Nobre & Silva, 2014). Social networks have transcended their conventional role as mere communication platforms

for individuals. Instead, in light of substantial technological advancements, SMEs must embrace social networking as a crucial communication channel (Choban et al., 2015; Naude et al., 2015) to gain a competitive edge. Not only does social networking serve as a potent marketing tool (Nobre & Silva, 2014) facilitating SME growth and development, but it has also spurred the emergence of social media marketing, broadening avenues for targeted customer outreach across various online platforms (Choban et al., 2015). Despite some research findings suggesting a lack of correlation between innovation and SME growth (Jagongo & Kinyua, 2013), it is theoretically evident that social networking is pivotal in enhancing SMEs' business performance, growth, and profitability, thereby fostering economic development.

Online Marketing: The SMEs Masterplan 2012-2020 identifies six primary challenges, including Innovation and Technology Adoption, Human Capital Development, Access to Financing, Market Access, Legal and Regulatory Environment, and Infrastructure. Notably, technology adoption emerges as the most impactful factor, significantly influencing total productivity and employment generation (SMECorp, 2011b). Lack of commercialization and limited awareness of research and development activities (Lee et al., 2013) underscore the critical importance of innovation and technology adoption for SMEs. Despite SMEs perceiving technology-driven innovation as costly and refraining from investing, thereby risking obsolescence and market competitiveness (National Survey on R&D, 2008), engaging in online marketing offers SMEs opportunities to augment profit margins and expand their businesses to capitalize on economies of scale.

Computerized Record: Recent studies advocate for integrating computerized record-keeping into SME accounting systems, citing benefits such as streamlined processes, reduced inventory discrepancies, enhanced data analysis, improved customer service, and increased profit margins (Fan & Fang, 2006, as cited in Jagongo & Kinyua, 2013). However, challenges such as organizational readiness and resource constraints have impeded widespread adoption of computerized record-keeping in SMEs (Motwani et al., 2002; Beke, 2010; Padachi, 2012). Despite the evident advantages, SMEs remain hesitant to embrace accounting software for digital record-keeping (Chong, 2012). In this study, computerized record-keeping encompasses financial records managed digitally, including sales, purchases, cash transactions, petty cash, and asset management (Maseko & Manyani, 2011). By leveraging computerized systems, SMEs can access business information more readily, facilitating informed decision-making and enhancing operational efficiency (Beke, 2010).

3. Methodology

In the ontological dimension, this study acknowledges the existence of objective reality while recognizing the importance of subjective interpretations, particularly within the context of small-scale enterprises in Kumasi Metro. Within the positivist paradigm, a quantitative research approach was adopted to gather and analyze numerical information. This approach facilitated the measurement of variables, statistical analysis, and identifying patterns and relationships among variables. The quantitative approach allowed for generalizations based on a representative sample, enhancing the study's ability to draw meaningful conclusions

about the population of interest (Bryman, 2016). To address the research objectives, a cross-sectional research design was used. This design involved collecting data from a sample of respondents at one point in time, allowing for the examination of relationships and associations among variables (Creswell, 2014). The data collection process involved administering structured questionnaires to owners/managers of the SMEs in Kumasi Metropolitan.

Data analysis was conducted using appropriate statistical techniques. Descriptive statistics, such as means, standard deviations, and frequencies, were adopted to summarize the characteristics of the study variables. Inferential statistics, including correlation analysis and regression analysis, analysis of variance (ANOVA), and the Statistical Package for the Social Sciences (SPSS) software were used for data analysis. The significance level was set at $p < 0.05$ to ascertain the statistical significance of the findings.

Descriptive statistics were utilized to summarize and present the main characteristics of the variables under investigation. Measures such as frequencies, percentages, means, and standard deviations were calculated to provide a clear overview of the data (Field, 2018). Inferential statistics were employed to test the research hypotheses and determine the significance of relationships between variables. Techniques like correlation analysis, regression analysis, and analysis of variance (ANOVA) were employed to determine the nature of the variables and the research inquiries (Field, 2018).

3.1 Validity and Reliability Instruments

To ensure the questionnaire's validity and reliability, a pilot test was conducted with a small group resembling the intended target population. This pilot phase aimed to identify potential issues or areas for improvement in the questionnaire design and wording (Dillman et al., 2016Reliability was assessed using Cronbach's Alpha test, which gauged the consistency of various categories. This test determined the degree to which score fluctuations across different variables could be ascribed to chance or random errors. In this study, the coefficient, when tested, was found to be 0.745, exceeding the threshold of 0.70, indicating good construct reliability (Ghozali, 2022). This implies that the items employed to examine technology practices and the performance of small-scale businesses exhibited internal stability, capable of yielding consistent findings over time.

Validity, measuring the accuracy of an instrument in obtaining data, was assessed through variance extract measurement. A high variance extract value indicated that the indicators were effectively represented in the developed latent constructs, with a minimum variance extract value of 0.50. The Chi-Square test was employed to examine whether there is a correlation between technological practices and SME performance in Kumasi, Ghana. This test was particularly relevant when both independent and dependent variables were categorical. Notably, several measures were undertaken to enhance the reliability and validity of the data collection instruments, ensuring the robustness of the research.

The questionnaire will include questions relating to technology practices, SME performance, inflation, and business location. The responses were analyzed to assess and measure the

relationships between these key variables. The study collected data from One hundred and nine (109) owners/managers in one hundred and nine (109) SMEs in the Kumasi Metro. Sampling was carried out gradually using a purposive sampling method and sampling area selection. Purposive sampling entails selecting samples based on specific criteria to ensure their relevance to the research design. For this study, the data encompassed demographic and economic information of respondents (such as age, education, marital status, gender, income, and length of business), along with data pertinent to the variables under scrutiny, namely human resource practices and firm performance. The samples were chosen from the Manhyia, Tafo and Suame sub-metros. Using cluster sampling, out of the one hundred and fifty (150) study population, forty-seven (47), seventy-two (72) and thirty-one (31) were chosen from Manhyia, Tafo and Suame, respectively.

4. Data Analysis and Discussion

4.1 Profile of Respondents

The table below represents the demographic data of the respondents which comprise of gender, age group, educational background, job role and years of experience.

Table 1. Demographic data of respondents

Questions	Categories	Number	Percentage
Gender	Male	80	73.4
	Female	29	26.6
	Total	109	100.0
Age	18 - 34 years	30	27.5
	35 – 49 years	41	37.6
	50 and above years	38	34.9
	Total	109	100
Educational Level	Secondary and below	40	36.7
	Diploma	38	34.9
	Degree and above	31	28.4
	Total	109	100.0
Number of employees	1 – 5	35	32.1
	6 – 20	61	56.0
	21 – 100	13	11.9
	101 – 250	0	
	More than 250	0	
	Total	109	100.0
Year of Existence	Less than 1 year	19	17.4
	1 – 5 years	50	45.9
	More than 5 years	40	36.7
	Total	109	100.0

The findings in Table 1. demonstrate that a significant portion of the study participants were male. Specifically, males constituted 80 (73.40%) of the sample, whilst females were only 29 (26.60%) of the total sample of 109. Even though the study had the males dominating, it is representative of the managers and owners within small and medium enterprises in the Kumasi metropolis, as reported by the World Economic Forum in 2020. The results in Table 1 above showed that the most significant proportion of respondents fell within the age range of

35 - 49 years, constituting 41 (37.60%), followed by age aged 50 and above, 38 (34.90%) and the least was 18 – 34 having 30 (27.50%) of the sample. This shows that most owners and managers of MSMEs in the Kumasi metropolis are in their middle youth ages, and they have more working time in the organization, all things being equal. Secondary school and below are dominant in the MSMEs in Kumasi with a total of 40 respondents (36.70%), followed by Diploma holders, constituting 38 (34.90%), whilst degrees and above constitute 31 (28.40%). Most of the workforce in MSMEs in Kumasi have educational background of secondary school or below. This might imply that a substantial portion of the workforce might have practical or vocational training, and their roles might be more hands-on or skill-based. The presence of diploma holders suggests a level of specialization or technical expertise in the workforce. The percentage of individuals with a degree or higher qualification, while lower, still signifies a noteworthy presence of individuals with formal higher education. This group is involved in managerial, administrative, or more knowledge-intensive roles. The data suggests that approximately 90% of the employees in these SMEs lack university qualifications, potentially reflecting perceptions among some educated Ghanaians regarding the suitability of such enterprises for their level of education. Additionally, it may highlight a prevailing emphasis on job-seeking rather than entrepreneurship in certain educational paradigms. Nevertheless, integrating technical education and business training institutions has played a vital role in fostering entrepreneurial mindsets among the younger generation, promoting self-sustainability and business acumen. According to Table 1 above, 61 (56.00%) of MSMEs have 6-20 staff followed by 1 -5 employees, 35 (32.10%) and, finally, 101-250 employees, 13 (11.9%). The other categories of the number of employees are nil, which agrees with the definition of MSME by the Ghana Statistical Service (GSS) as discussed in section 2.2.3 of this study. Also, according to the findings, 50 (45.90%) of MSMEs have existed for one year to five years, followed by more than 5 years existence 40 (36.70%), with the least occurrence of MSMEs having less than 1 year in existence. Purposive sampling was used to achieve this since such organizations are perceived to have a greater insight into human resources management and performance issues (Noe, 2017). The dominance of MSMEs with 1 to 5 years of existence indicates a dynamic business environment where new enterprises are continuously emerging, and some are able to establish themselves over the initial years. Also, a significant number of MSMEs operating for more than 5 years suggests stability and adaptability in the business landscape, as these businesses have navigated through multiple operational cycles. This information is vital for devising strategies for supporting newer businesses, ensuring the sustainability of those in their growth phase, and recognizing the contributions of more established businesses to the local economy.

4.2 Validity and Reliability of the Instruments

To check for reliability and validity of the instruments, a preliminary study was undertaken to examine accuracy, precision, clarity, and appropriateness of the procedure of instrument administration. All the things included in the scale had been analyzed in the literature survey. Hence, I consider that the validity of the content is guaranteed. Table 1. shows the validity and reliability results of the main variables.

Table 2. Reliability Statistics

Variables	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Employee Engagement Platform.	.724	.725	4
Digital Recruitment Strategies	.770	.778	8
Technological Training Initiative	.750	.751	5
Performance	.735	.763	14
Overall	.745	.754	31

The Cronbach's alpha coefficients for all scale variables exceeded 0.70 ($\alpha > 0.70$), with the overall reliability coefficient at 0.745, surpassing the threshold of 0.70. These findings indicate that the items employed to examine technology practices and small-scale business performance demonstrated internal stability. Consequently, they possess the reliability to yield consistent results across multiple studies.

5. Correlation Analysis

The correlation analysis method was used to explain the link among all the variables, human resource management practices (Technological training Initiative, Digital Recruitment, employee Engagement Platforms) and MSMEs performance, as seen in Table 3. Pearson correlation was utilized to assess these relationships, given that all variables exhibited a normal distribution.

Table 3. Correlation of Variables

Variables		SME-P	R&S	T&D	R-M
SME performance (SME-P)	Pearson correlation	1	0.648**	0.461**	0.732**
	Sig. (2-tailed)		0.000	0.005	0.000
	N	109	109	109	109
Digital Recruitment and strategies (DR&S)	Pearson correlation	0.648**	1	0.742**	0.478**
	Sig. (2-tailed)	0.000		0.000	0.003
	N	109	109	109	109
Technological Training Initiative	Pearson correlation	0.461**	0.742**	1	0.385*
	Sig. (2-tailed)	0.005	0.000		0.020
	N	109	109	109	109
Employee Engagement Platforms	Pearson correlation	0.732**	0.478**	0.385*	1
	Sig. (2-tailed)	0.000	0.003	0.020	
	N	109	109	109	109

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

The correlation matrix reveals insightful relationships among critical variables in the study, specifically focusing on SME performance (SME-P), Digital Recruitment and Strategies (DR&S), Technological Training and Initiatives (TT&D), and Employee Engagement Platform (EE-P).

Firstly, SME performance positively correlates with Digital Recruitment and Strategies

(DR&S) and Employee Engagement Platform (EE-P). The correlation coefficients of 0.648 and 0.732 ($p < 0.001$) suggests a strong relationship. This implies that as Digital Recruitment and Strategies (DR&S) processes improve and as effective performance, SME performance tends to exhibit growth.

Examining Digital Recruitment and Strategies (DR&S) not only demonstrates a strong positive correlation with SME performance but also exhibits strong positive correlations with Technological Training Initiatives (TT&D) and Employee Engagement Platforms (EE-P). These correlations of 0.742 and 0.478, respectively (both $p < 0.001$ and $p = 0.003$),

Turning attention to Technological Training and Initiative (TT&D), beyond its correlation with SME performance, it displays a positive correlation with Performance (Pearson correlation = 0.385, $p = 0.020$). This suggests that SMEs emphasizing Technological training and development are likely to have more effective performance for growth and development. Lastly, the Employee Engagement Platform (EE-P) correlates positively with SME performance and with Digital Recruitment and Strategies (DR&S). The correlation coefficient is 0.478 ($p = 0.003$).

In summary, these findings highlight the interconnected nature of these Technological practices. Improvements or efficiencies in one area, whether it be digital recruitment and strategies, technological training and development, or employee engagement platforms, are associated with positive outcomes in others. These insights can inform strategic decisions for SMEs, emphasizing the integrated importance of these technology functions for overall SME performance.

6. Descriptive Statistics

When examining technological practices, mean scores surpassing 3.50 were construed as indicative of a high presence of the practice, mean scores falling below 2.50 were interpreted as representing a low presence of the practice, and mean scores ranging between 2.50 and 3.50 were regarded as reflective of a moderate presence of the practice. Meanwhile, the standard deviation illustrated the variance in participants' opinions regarding various issues raised by the researcher. Lower standard deviation values suggest greater consensus among opinions, whereas higher values indicate more significant divergence.

Table 4. Descriptive analysis of MSME Performance

Variable List	Mean	Std. Deviation
Expanding collaboration with other firms	4.07	.811
Open up outlets across the country	4.05	.927
Investing in customer acquisition.	4.00	.961
Expand product lines	3.97	.898
Use modern and advanced technologies	3.88	.875
Diversify product line	3.87	.772
Penetrate new markets	3.76	1.059
Establishing R&D department	3.58	1.168
Increase production	3.36	1.015
Sell products online	2.53	1.345

The researchers highlighted various performance metrics to the participants, dividing them into two categories. According to the statistics, specific indicators stand out as strong performers. Collaborating with other firms, scoring (mean = 4.07), opening country outlets (mean = 4.05) and investing in customer acquisition (mean = 4.00) are perceived as highly effective strategies. Employees perceive these indicators as solid signals that SMEs are achieving high performance.

On the other hand, some indicators are seen as moderately effective. Increasing production, with a score of (mean = 3.36), and selling products online (mean = 2.53) fall into this category. While these strategies still contribute positively to performance, they are viewed as less impactful compared to the first group.

6.1 Specific Technology Practices and the Performance of SMEs

Table 5. Specific Technology practices and SMEs performance

Model	Coefficients	Std. Error	t-value	p-value
(Constant)	.455	.260	4.500	<0.001
Digital Recruitment and Selection	.455	.010	4.500	<0.001
Technological Training and Development	.366	.008	4.000	<0.001
Employee Engagement Platform	.512	.12	4.250	<0.001

The coefficient of 0.455 for Digital Recruitment and Selection indicates that for a one-unit increase in the score for Digital Recruitment & Selection, the expected change in the performance indicator is 0.45 units. The t-value of 4.50 is statistically significant ($p < 0.001$), suggesting that the relationship between digital recruitment & selection and the performance indicator is not due to chance. Therefore, SMEs that score higher in digital recruitment & selection are expected to have higher performance indicators.

In the case of technological training and development, the coefficient of 0.36 indicates that for a one-unit increase in the score for digital training & development, the expected change in the performance indicator is 0.36 units. The t-value of 4.00 is statistically significant ($p < 0.001$), indicating a significant relationship between technological training & development and the performance indicator. This suggests that SMEs stand to enhance their performance indicators by increasing their investment in technological training and development.

The coefficient of 0.51 regarding employee engagement platform suggests that for a one-unit increase in the score for employee engagement platform, the expected change in the performance indicator is 0.51 units. The t-value of 4.25 is statistically significant ($p < 0.001$), indicating a strong association between the employee engagement platform and the performance indicator. SMEs with robust employee engagement platform practices are expected to have higher performance indicators.

6.2 Technology Practices and the Performance of SMEs Relationship

In this study, multiple regressions were employed to gauge the impact of various human resource practices, including employee engagement platforms, technological training, and

digital recruitment, on the performance of SMEs. ANOVA (Analysis of Variation) was utilized to assess the model's validity. Furthermore, the researchers used R-square to evaluate the overall influence of technological adaptation on the performance of SMEs within the Kumasi metropolitan area.

Table 6. Multiple regression analysis: ANOVA

Model	Sum of squares	Df.	Mean square	F	Sig.
Regression	21.243	3	7.081	47.290	.000(a)
Residual	21.262	142	.150		
Total	42.504	145			

Predictors: (Constant), employee engagement platform, technological training, digital recruitment
b Dependent Variable: Performance

ANOVA assesses the independent variable's viability in predicting fluctuations in the dependent variable. In this study, the researchers aimed to ascertain the significance of technology practices in explaining variations in the performance of SMEs in the Kumasi Metropolis. The regression sum of squares denotes the extent to which the independent variable explains variance in the dependent variable. In contrast, the residual sum of squares signifies the portion of the dependent variable not accounted for by the independent variable. Notably, this study's regression and residual sum of squares are nearly equivalent, indicating that technology practices elucidate approximately 50% of the variance in MSMEs' performance. The statistically significant F-statistic (sig. <.05) suggests that the influence of technology practices on SME performance in the Kumasi Metropolis is not attributable to random chance.

Table 7. Multiple regression analysis: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.707[a]	.500	.489	.38695

a Predictors: (Constant), technological training, Employee engagement, digital recruitment

The correlation between technology practices and performance (r = .707) is positive but also significant and robust. This signifies that variations in technology practices among SMEs in the Kumasi Metropolis strongly correlate with positive changes in SME performance. In other words, SMEs that focus on enhancing their technology practices will likely observe improvements in their performance outcomes. Given that the sample selection was representative of all SMEs in the Kumasi Metropolis, it can be inferred that enhancing technological advancement practices can yield significant enhancements in SME performance. The R-squared value of .500 indicates that technology practices explain approximately half of the variations in SME performance. While this suggests that technology practices play a substantial role in explaining performance discrepancies among SMEs in the Kumasi Metro, it is essential to note that other factors also contribute to performance variations in this context.

Table 8. Multiple regression analysis: Model summary

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.648	.260		2.487	.014
Employee Engagement Platform	.332	.066	.380	5.051	.000
Digital Recruitment	.189	.084	.197	2.241	.027
Employee technological training	.230	.072	.255	3.188	.002

a. Dependent Variable: Performance

The researchers opted for standardized beta coefficients due to their ease of comparison. According to the findings, for every unit change in the Employee Engagement Platform, SME performance varies by 38.0% (Beta = .380). Similarly, a unit change in Digital Recruitment corresponds to a performance variation of 19.7% (Beta = .197), while a unit change in Employee Technological Training results in a performance variation of 25.5% (Beta = .255). These values suggest that the Employee Engagement Platform will probably have the most significant impact on the performance of SMEs in the Kumasi Metropolis. Moreover, the significance levels indicate that the Employee Engagement Platform, Employee Technological Training, and Digital Recruitment highly impact the performance of SMEs in the Kumasi Metropolis. When implemented effectively, these practices can improve product quality, enhance performance, visible customer care, and bolster the company's reputation.

7. Mediation Analysis

M : 3

Y : MSME Performance (MSME-P)

X : HRM Practices (HRM-P)

M1: Technology (TECH)

Table 9. Outcome Variable: Technology (Model Summary)

R	R-sq	MSE	F	df1	df2	p
.6044	.3653	14.4097	107.6611	1.0000	186.0000	.0000
Model						
	Coeff	Se	T	p	LLCI	ULCI
Constant	1.4961	1.6048	.9322	.3523	-1.6698	4.6622
MSME-P	.2238	.0215	10.3764	.0000	.1812	.2663

The process macro version 3.5 result indicates that Human Resource Management Practices (HRM-P) is a significant predictor of Technology (TECH) by β = 0.224, P =001. This result shows that increasing a unit on human resource management practices causes technology to increase by 0.0224.

The findings from Process Macro Version 3.5 reveal that Human Resource Management Practices (HRM-P) serve as a significant predictor of Technology (TECH) with β = 0.224 and

P = 0.001. This finding illustrates how a unit increase in HRM procedures results in a 0.0224 increase in technology.

Table 10. Outcome Variable: MSME Performance (Model Summary)

R	R-sq	MSE	F	df1	df2	p
.6443	.4152	8.6915	43.7945	3.0000	184.0000	.0000
Model	Coeff	Se	T	P	LLCI	ULCI
Constant	.9256	1.3344	.6935	.4887	-1.7071	3.5584
HRM-P	.0954	.0222	4.2730	.0000	.0513	.1394
TECH	.1941	.0596	3.2523	.0013	.0763	.3120

As the process macro result points out, human resource management practices affect MSME Performance (MSME-P) with β = 0.0955 and a p-value of 0.001. Likewise, the utilization of technology emerges as a significant predictor of MSME performance with β = 0.1941 and a p-value of 0.001. This implies that for every unit increase in human resource management practices, MSME performance sees a corresponding increase of 0.0955, considering the mediator variable-similarly, a one-unit increase in technology results in a 0.1941 increase in MSME performance.

Table 11. Total effect Model - Outcome Variable: MSME-P (Model Summary)

R	R-sq	MSE	F	df1	df2	P
.5755	.3312	9.8347	92.6125	1.0000	187.0000	.0000
Model						
	Coeff	Se	T	p	LLCI	ULCI
Constant	2.6073	1.3258	1.9664	.0506	-.0081	5.2220
HRM-P	.1714	.0177	9.6234	.0000	.1363	.2066

Table 12. Total effect of X on Y

Effect	Se	T	P	LLCI	ULCI
.1714	.0177	9.6234	.0000	.1363	.2066
Direct effect of X on Y					
Effect	se	T	P	LLCI	ULCI
.0955	.0223	4.2740	.0000	.0514	.1395
Indirect effect(s) of X on Y:					
	Effect	BootSE	BootLLCI	BootULCI	
TOTAL	.0761	.0174	.0426	.1115	
TECH	.0435	.0170	.0124	.0786	
(C1)	.0109	.0273	-.0423	.0654	

8. Total Direct and Indirect Results

In the analysis conducted using Process Marco (version 3.5), it was found that there is a substantial total effect of human resource management practices on organizational performance (β = 0.1714 and p-value = 0.000). This signifies that organizational performance experiences a parallel increase of 0.1714 for each unit increase in technological practices,

independent of any mediating variables. The presence of technology plays a critical role in influencing the connection between MSME performance. Following Baron and Kenny's (1986) suggestion, the hypothesis posited that if there are significant impacts of the independent variable on the dependent variable in the existence of mediators, then a direct effect exists. Subsequently, our hypothesis finds support as the direct effect between human resource practices and MSME performance emerges as statistically significant.

The unstandardized indirect mediation analysis reveals that the impact of technology-mediated human resource management methods on MSME performance is 0.0435, which is statistically significant (since zero lies outside the confidence interval of 0.0124, 0.0786). Following Baron and Kenny's (1986) conceptualization, the indirect effect delineates the impact of the independent variable on the dependent variable through a mediator (a*b). In version 3.5 of the process macro analysis, the indirect effect of human resource management practices on MSME performance is deemed statistically significant, thereby substantiating our hypothesis.

8.1 Discussion of Results

The investigation into the intricate dynamics of technology and its influence on the correlation between MSME's performance in Kumasi culminated in a noteworthy revelation. The study discerned that technology significantly shapes the connection between SMEs and organization's performance within Kumasi Metro. The study, by empirically substantiating this linkage, not only adds a nuanced layer to the existing body of knowledge but also underscores the practical significance for organizations in the performance of MSMEs within Kumasi Metro.

Furthermore, the study's inclusion of diverse staff members enhances its findings' generalizability, suggesting that technology's impact on SMEs and performance nexus is applicable across various MSMEs. According to Gottman et al. (2018), technology is a critical mediating process underlying MSME performance to promote socio-economic development.

9. Conclusion

The study concludes that technology's intricate dynamics unveil a substantial impact on the connection between MSME performance and economic growth. This aligns seamlessly with the resource-based view theory, adding a nuanced layer to existing knowledge. The study's inclusivity of diverse staff members enhances the generalizability of findings, emphasizing the applicability of technology's impact on MSME performance across various enterprises, which is pivotal in enhancing MSME performance, which leads to economic growth and development. The study advances empirical understanding and contributes to the theoretical framework guiding technological advancement practices in the unique context of Ghanaian SMEs to promote economic growth. Recognizing the role of technology in shaping MSME performance, the research recommended that businesses are encouraged to strategically integrate technology into their operations processes to foster a culture that embraces adaptability and innovation for economic growth. Governments and relevant stakeholders are

encouraged to design and implement support programs tailored to MSMEs. These programs could include advanced technological training, digital recruitment, financial assistance, capacity-building initiatives, and policy frameworks that create an enabling environment for technological development.

10. Recommendations

Here are some recommendations for enhancing the effectiveness and efficiency of small-scale enterprises (SMEs) through the strategic application of technology to contribute to overall economic growth in Ghana:

i. **Investment in Digital Infrastructure**: The government and relevant stakeholders should prioritize investment in digital infrastructure to improve internet connectivity and access to technology in the Kumasi Metropolis. This would facilitate SMEs' adoption of digital tools and platforms, thereby enhancing their productivity and competitiveness.

ii. **Technology Training and Capacity Building**: SME owners and employees should receive training and capacity-building programs focused on technology utilization. Workshops, seminars, and skill development initiatives can help SMEs leverage technology effectively to streamline operations, enhance product quality, and reach new markets.

iii. **Access to Financing for Technology Adoption**: Financial institutions and government agencies should design specialized financing schemes to support SMEs acquiring and implementing technology solutions. This could include low-interest loans, grants, or subsidies to reduce the financial barriers to technology adoption.

iv. **Promotion of Digital Entrepreneurship**: Encouraging the emergence of digital entrepreneurs within the Kumasi Metropolis can foster innovation and the development of technology-driven solutions tailored to the needs of local SMEs. Initiatives such as incubation programs, startup competitions, and mentorship networks can nurture a vibrant digital entrepreneurship ecosystem.

v. **Facilitation of Collaboration and Networking**: Platforms should be created to facilitate collaboration and networking among SMEs, technology providers, government agencies, and other stakeholders. Collaborative initiatives can promote knowledge sharing, resource pooling, and collective problem-solving, accelerating technology adoption and innovation.

vi. **Incentives for Innovation and Research**: The government should introduce tax breaks, grants, or awards to incentivize SMEs to invest in research and innovation. Encouraging a culture of innovation can lead to the development of locally relevant technology solutions that address specific challenges SMEs face in the Kumasi Metropolis.

vii. **Data Security and Privacy Measures**: As SMEs increasingly rely on digital platforms and data-driven processes, it is essential to prioritize data security and

privacy measures. Policies and regulations should be implemented to safeguard sensitive business information and customer data from cyber threats and breaches.

viii. **Monitoring and Evaluation**: Regular monitoring and evaluation mechanisms should be established to assess the impact of technology adoption on the performance of SMEs in the Kumasi Metropolis. Feedback loops and performance metrics can help identify areas for improvement and refine strategies for maximizing the benefits of technology in driving economic growth.

By implementing these recommendations, stakeholders can empower SMEs in the Kumasi Metropolis to harness the transformative potential of technology, ultimately contributing to their performance and fostering sustainable economic growth in Ghana.

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Authors contributions

Dr Daniel Ofori conceived and drafted the opening. Analyze the quantitative data gathered from the field. Professor Owusu Eric Edwin and Mr. Anthony Kusi reviewed the study methodology. Dr Oppong Peprah proofread the study and organized the study references. All authors read and approved the final manuscript and nominated Professor Owusu to be the corresponding author.

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