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*Correlation between Technical Skills and Sustained Competitive Advantage among Information Technology Networking Small and Medium Enterprises in Kenya*

# Correlation between Technical Skills and Sustained Competitive Advantage among Information Technology Networking Small and Medium Enterprises in Kenya

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**Abstract**
This study aimed to quantify the strength and direction of the relationship between managers' technical skills and firms' sustained competitive advantage among IT networking SMEs in Kenya. The study adopted a positivist philosophy and a descriptive correlational design. A stratified random sample of 292 senior managerial employees was targeted from 365 licensed IT networking SMEs across Kenya's eight ICT Authority licensing tiers; 242 valid responses were achieved (response rate = 82.9%), using a structured, closed-ended questionnaire on a 5-point Likert scale. Data were analysed using SPSS version 28, employing descriptive statistics and simple linear regression to test the hypothesised relationship. Technical skills were highly developed among managers, with ICT functional skills recording the highest mean (M = 3.99), followed by ICT problem-solving skills (M = 3.97) and ICT analytical skills (M = 3.87). At the composite level, regression analysis showed a positive and statistically significant association between technical skills (M = 3.87, SD = 0.63) and sustained competitive advantage (M = 3.87, SD = 0.36) ($\beta = 0.607$, $R^2 = 0.369$, $p < .001$), with technical skills accounting for 36.9% of the variance in sustained competitive advantage. The cross-sectional, single-source, self-reported design limits causal inference and may be subject to common method bias; the sample was nested within firms without adjustment for clustering, and the sampling precision estimate does not account for the study's stratified, clustered design. Findings are specific to licensed IT networking SMEs in Kenya. Therefore, firms should invest in structured technical skills training for managers to strengthen their capacity to sustain competitive advantage in a dynamic ICT market.

## Introduction
Firms today operate in dynamic markets, characterised by rapid and discontinuous change (Teece, 2007; Li et al., 2019). This environment intensifies the risk of strategic obsolescence for small and medium enterprises (SMEs), which often lack the resource buffers of larger organisations (Budiarto et al., 2024). While the Resource-Based View (RBV) holds that competitive advantage stems from valuable, rare, inimitable, and non-substitutable resources (Barney, 1991), simply possessing resources is insufficient in dynamic markets, advantages are increasingly transient, quickly eroded by imitation

and innovation (Abbasi Kamardi et al., 2022). Strategic focus has therefore shifted toward building sustained competitive advantage through the continuous reconfiguration of resources to match changing environments (Hossain et al., 2020).

Central to this reconfiguration are managerial skills, and among these, technical skill, proficiency in the specific tasks, methods, and processes of a work area (Katz, 1974), is particularly critical in technology-intensive sectors. In IT networking specifically, technical skill requires proficiency in internetworking protocols, network switches, routers, and network architecture, combined with creative problem-solving and proactive threat management (Bay, 2019). As the sector evolves rapidly with big data, the Internet of Things, and artificial intelligence, IT networking SMEs face growing pressure to develop functional, analytical, and problem-solving competencies to remain competitive (Imagha et al., 2023).

Kenya's IT networking sub-sector operates within a fast-growing digital economy. As of March 2025, the country recorded over 76 million mobile (SIM) subscriptions and a broadband penetration rate exceeding 145 subscriptions per 100 people (Communications Authority of Kenya, 2025). This figure reflects subscription density rather than the share of individuals with broadband access, as it is inflated by multiple SIM ownership per person. SMEs account for approximately 98% of business establishments and contribute significantly to employment and GDP growth (Kenya National Bureau of Statistics (KNBS), 2021), yet more than 70% fail within their first three years of operation (Douglas et al., 2017). This persistently high failure rate, set against strong digital demand, suggests structural weaknesses in how technical capabilities are developed and converted into sustained competitive advantage among SMEs. This study adopted the definition commonly used by the World Trade Organisation, under which micro, small, and medium enterprises (MSMEs) are firms employing up to 250 people, with medium firms typically defined as those with up to 250 employees (WTO, 2017).

Empirical evidence links managerial and technical skills to firm performance across contexts (Asghar et al., 2023; Ngasike et al., 2025), yet the literature offers limited, context-specific guidance on how the technical skill relates with sustained competitive advantage among IT networking SMEs specifically. Existing studies tend to treat managerial competence broadly or focus on other sectors, leaving a gap in understanding the relationship between technical competencies and competitive advantage. This study addresses that gap by examining the correlation between technical skills and sustained competitive advantage among IT networking SMEs in Kenya.

**Theoretical Framework**

This study is anchored on Katz's (1955, 1974) managerial skills theory, integrated with the Resource-Based View (RBV) of the firm (Barney, 1991) to explain how an individual-level managerial capability can generate firm-level sustained competitive advantage. Katz's theory identifies technical skill, proficiency in the specific tools, methods, and processes of a work area, as one of three core managerial competencies, alongside human and conceptual skill. Of the three, technical skill is most directly tied to an organisation's core value proposition: for a knowledge- and infrastructure-intensive business such as IT networking, technical competence is not a peripheral input but the foundation of the actual product or service delivered to clients (Adula et al., 2023). However, Katz's framework operates at the level of the individual manager and does not itself explain how a manager's technical proficiency accumulates into an organisational, sustained advantage, a limitation acknowledged even in applications of the model (Adera & Omwenga, 2017).

The RBV addresses this gap. Barney (1991) argues that sustained competitive advantage arises when a firm controls resource that are valuable, rare, inimitable, and non-substitutable (VRIN), and that such resources allow a firm to implement strategies that competitors cannot easily replicate. Technical

skill, when developed through experience and embedded in a firm's routines rather than residing solely in one individual, satisfies these conditions: it is valuable because it enables reliable service delivery, rare because deep networking and ICT expertise is unevenly distributed among competing firms, and comparatively inimitable because it is accumulated through firm-specific experience rather than easily purchased or copied (Roumpi et al., 2019). Read together, Katz's theory identifies technical skill as a distinct managerial competency, while the RBV explains the conditions under which that competency, once organised and deployed within the firm, becomes a source of sustained rather than transient advantage.

For this study, technical skill was operationalised across three dimensions, ICT functional skills, ICT analytical skills, and ICT problem-solving skills. This tripartition is not drawn from a single existing instrument or study; rather, it is the authors' own construction, synthesised from three distinct strands of literature that each independently identify one of these competencies as a component of technical skill in ICT and managerial contexts. Functional skill, reflecting proficiency in the tools and processes needed to manage ICT systems and networking infrastructure, draws on Dang (2023) and Bay (2019); analytical skill, reflecting the capacity to process information and draw evidence-based conclusions, draws on Adula et al. (2023); and problem-solving skill, reflecting the capacity to identify, analyse, and resolve complex operational problems, draws on Endrejat and Burnes (2022), whose conceptualisation traces to Kurt Lewin's problem-solving framework. We adopt this three-way decomposition, rather than treating technical skill as a single undifferentiated construct, because these three competencies map onto functionally distinct managerial tasks in IT networking work: executing routine technical operations, interpreting data and diagnosing patterns, and resolving novel or complex operational problems, which are conceptually separable even though they were combined into a single composite score for the regression analysis reported here.

Building on this theoretical logic, the study hypothesised that there is a significant correlation between technical skill and sustained competitive advantage among IT networking SMEs in Kenya. This leads to the study's null hypothesis:

$H_0$: There is no significant correlation between technical skills and sustained competitive advantage among information technology networking small and medium enterprises in Kenya.

**Empirical Review**

Technical skills have become a cornerstone of competitive differentiation in the digital economy, particularly for IT networking SMEs operating in fast-evolving, innovation-driven markets. Technical capability enables SMEs to automate tasks, enhance data-driven decision-making, deliver customised solutions, and build the collaborative ecosystems that strengthen relational capital and innovation potential, outcomes that directly support sustained competitive advantage by enabling differentiated service delivery and cost efficiency. However, despite Kenya's expanding digital landscape, many SMEs continue to struggle with skill shortages, infrastructure gaps, and limited digital training opportunities (Kenya Institute for Public Policy Research and Analysis (KIPPRA), 2023), constraining the translation of technical capability into competitive outcomes.

Functional skills, domain-specific technical competencies that enable diagnosis of complex challenges and application of specialised knowledge (Jafari Roodbandi, 2025), are foundational enablers of operational efficiency in ICT-intensive sectors. Dang (2023) demonstrated that embedding expert domain knowledge into predictive maintenance models improves precision and reduces downtime in manufacturing systems, though the study's technologically deterministic focus leaves the managerial dimensions of implementation unexplored. D'Souza et al. (2022) approached functional competence through cross-functional integration, validating a three-dimensional instrument

(collaboration, coordination, communication) that revealed measurable but modest gaps between academic preparation and industry expectations. Together, these studies suggest functional skill in ICT SMEs requires both technical depth and interdisciplinary breadth, with effectiveness contingent on alignment with strategic intent and organisational context (Jafari Roodbandi, 2025).

Analytical skills enable managers to evaluate alternatives, interpret data, and make evidence-based decisions (Mohamed et al., 2024), representing a cognitive and strategic capability that extends beyond technical proficiency to strategic foresight (Radhika & Li, 2024). Schultz (2020) found no significant demographic variation in analytical skill levels among line managers, suggesting analytical competence may be a broadly distributed managerial attribute, though the corporate, cross-sectional design limits its applicability to resource-constrained SME contexts. Rodrigo et al. (2025) found analytical skills ranked as employers' highest priority among financial engineering professionals, while Imjai et al. (2025), using structural equation modelling, showed that AI literacy enhances adaptability and critical thinking, which in turn strengthen analytical proficiency, offering a stronger causal account of how analytical capability develops. Across these studies, analytical skill consistently emerges as a critical predictor of managerial effectiveness, though its translation into strategic outcomes such as market share or sustained advantage remains underexplored, particularly in African contexts characterised by uneven digital literacy and infrastructural constraints.

Problem-solving represents a core managerial capability for navigating uncertainty and sustaining competitiveness, conceptualised as a multidimensional cognitive process involving ambiguous, dynamic, and interrelated challenges (Nicolay et al., 2021; Weise et al., 2020). Hudha et al. (2023), in a systematic review of 69 studies, found that problem-based learning consistently enhances analytical reasoning, though its effectiveness varies with institutional support and learner autonomy. Faisal et al. (2023) identified transferable problem-solving sub-skills, critical thinking, creativity, teamwork, decision-making, resilience, and self-awareness, through ERP-simulation training, while Lassoueda et al. (2020) found a significant positive correlation between managerial empowerment and problem-solving effectiveness among administrative employees. Collectively, these studies indicate that problem-solving is a learnable, transferable managerial skill, but its effectiveness is moderated by contextual enablers such as leadership style, workplace culture, and access to resources, factors that are particularly salient for Kenyan ICT SMEs operating amid infrastructural and market volatility.

The literature establishes technical skill, spanning functional, analytical, and problem-solving competencies as a well-evidenced driver of firm performance, but reveals a context gap: most empirical work originates from higher-income, better-resourced settings or focuses on educational and corporate contexts rather than SMEs operating under the infrastructural and institutional constraints characteristic of Kenya's IT networking sector. This study addresses that gap by empirically testing the correlation between technical skill and sustained competitive advantage among IT networking SMEs in Kenya.

## Method

### *Research Design*

The study adopted a positivist research philosophy and a descriptive correlational design to quantitatively examine the correlation between technical skills and sustained competitive advantage among IT networking SMEs in Kenya. This design was appropriate as it enabled the simultaneous description of study variables and statistical testing of their relationships without manipulation of the research environment (Cooper & Schindler, 2014), consistent with the study's deductive, hypothesis-testing approach.

### *Population and Sampling*

The target population comprised 1,078 senior employees (top, middle, and lower management) drawn from 365 licensed IT networking SMEs in Kenya, as verified through the ICT Authority registry (August 2025). Firms in this population are classified under the ICT Authority's supplier accreditation framework into eight licensing tiers, ICTA 1 through ICTA 8, graded on the basis of the firm's experience, proven capacity, and the competence of its technical staff and other resources; ICTA 1 represents the highest grade, held by the most experienced and capacity-rich firms, while ICTA 8 represents the lowest grade, typically held by newer entrants with less established capacity.

A stratified random sampling technique was used to ensure proportional representation across the eight licensing tiers and across the three management levels (top, middle, and lower management). The sample size was determined using Yamane's (1967) simplified formula for finite populations, at a 95% confidence level and 5% margin of error, yielding a baseline sample of 292 respondents, proportionally distributed across the eight licensing tiers. Data collection ultimately achieved 242 usable responses, with respondents drawn from firms across all eight licensing tiers (Table 1). As respondents were nested within 365 firms, with an average of approximately three eligible respondents per firm, some firms are represented by more than one respondent in the achieved sample.

### *Data Collection*

Primary data were collected using a structured, closed-ended questionnaire administered electronically via Google Forms, with a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) measuring functional, analytical, and problem-solving skills, and sustained competitive advantage (market share growth, superior quality of services/products, and brand reputation). The instrument was refined through expert review and a pilot study involving 30 respondents (10% of the sample). Instrument reliability was assessed using Cronbach's alpha on the analytic sample (n = 242). The technical skills scale (15 items) achieved an alpha of .785, and the sustained competitive advantage scale (36 items) achieved an alpha of .791, both exceeding the minimum acceptable threshold of 0.70 (Taber, 2018), indicating satisfactory internal consistency for both constructs in the sample actually analyzed. The 30 respondents who participated in the pilot study were excluded from the final analytic sample to avoid duplication of responses.

### *Data Analysis*

Data were cleaned, coded, and analysed using SPSS version 28. Descriptive statistics (frequencies, means, standard deviations) summarised respondent and variable characteristics. Prior to regression analysis, the assumptions of normality, linearity, and homoscedasticity were assessed. Normality of the technical skills variable was evaluated by visual inspection of a histogram with an overlaid normal curve, which showed an approximately bell-shaped distribution. Homoscedasticity was assessed by regressing the squared residuals of the technical skills–SCA model on technical skills; the model was not statistically significant ($F(1, 240) = 1.216$, $p = .271$), indicating no evidence of heteroscedasticity and confirming that error variance was constant across levels of technical skills. Linearity was assessed via a scatterplot of technical skills against sustained competitive advantage, which showed a positive, approximately linear association with no evident curvature, supporting the use of a linear regression model.

Simple linear regression was used to test the correlation between technical skills and sustained competitive advantage, specified as:

$$Y = \beta_0 + \beta_1 X + \varepsilon$$

where Y is sustained competitive advantage, $\beta_0$ is the intercept, $\beta_1$ is the regression coefficient, X is the technical skills score, and $\varepsilon$ is the error term. The model was interpreted using the regression coefficient and its significance ($p < 0.05$), the ANOVA table for model fit, and $R^2$ for variance explained.

The corresponding null hypothesis tested was:

**H0:** There is no significant correlation between technical skills and sustained competitive advantage among small and medium-sized information technology networking enterprises in Kenya.

***Ethical Consideration***

Ethical clearance was obtained from the United States International University-Africa Institutional Scientific and Ethics Review Committee (ISERC Ref: USIU-A/ISERC/US12221-2025), and a research permit was secured from the National Commission for Science, Technology and Innovation (NACOSTI Licence No. NACOSTI/P/25/4182960) prior to data collection. Respondents' rights were discussed with them during the selection process, and each respondent was provided with a consent form confirming that participation was voluntary, that they could withdraw at any time without providing a reason and without any effect on their rights, and that they could decline to answer any particular question. Respondents were assured that their contributions would remain confidential; participant names were removed from all data and replaced with a numeric coding system to protect anonymity. As data were collected electronically via Google Forms, data handling complied with the Kenya Data Protection Act, 2019, including obtaining informed consent for the electronic collection and processing of personal data, limiting access to the data to the researcher, and storing records securely. Electronic records were kept on a password-protected computer, and the master copy of the research data was stored on an external digital hard drive kept in a lockable safe accessible only to the researcher.

**Results**

***Demographic Characteristics***

Demographic information was collected on key characteristics, including sex, age, level of education, management level, job experience, licensing tier (ICTA), and number of employees. Examining these characteristics was important for assessing the representativeness of the sample and for providing context for interpreting the study findings. The results of the demographic analysis are presented in Table 1.

*Table 1: Demographic Characteristics*

| Demographic | Characteristics | Frequency | Percent |
|---|---|---|---|
| Sex | Male | 175 | 72.3% |
| | Female | 67 | 27.7% |
| Age | Below 30 years | 46 | 19.0% |
| | 30–39 years | 78 | 32.2% |
| | 40–49 years | 74 | 30.6% |
| | 50–59 years | 40 | 16.5% |
| | 60 years and above | 4 | 1.7% |
| Education | Certificate | 2 | 0.8% |
| | Diploma | 18 | 7.4% |
| | Bachelor's Degree | 121 | 50.0% |
| | Master's Degree | 84 | 34.7% |
| | Doctorate (PhD) | 17 | 7.0% |
| Management Level | Top Management | 75 | 31.0% |
| | Middle Management | 87 | 36.0% |
| | Lower Management | 80 | 33.1% |
| Job Experience | Less than 2 years | 28 | 11.6% |
| | 2–5 years | 72 | 29.8% |
| | 6–10 years | 86 | 35.5% |
| | More than 10 years | 56 | 23.1% |
| Licensing Tier (ICTA) | ICTA 1 | 51 | 21.1% |
| | ICTA 2 | 38 | 15.7% |
| | ICTA 3 | 47 | 19.4% |
| | ICTA 4 | 32 | 13.2% |
| | ICTA 5 | 22 | 9.1% |
| | ICTA 6 | 13 | 5.4% |
| | ICTA 7 | 17 | 7.0% |
| | ICTA 8 | 22 | 9.1% |
| Number of Employees | 0 – 9 | 40 | 16.5% |
| | 10 – 49 | 118 | 48.8% |
| | 50 – 99 | 48 | 19.8% |
| | Over 100 | 36 | 14.9% |

The demographic profile of the respondents indicates an experienced and well-educated workforce drawn largely from small and medium-sized ICT firms. In terms of gender distribution, the sample is male dominated (72.3%), suggesting a gender imbalance within IT networking SMEs, which may reflect broader industry trends. Age distribution shows that the majority of respondents are in their prime working years, with 62.8% aged between 30–49 years, indicating a mature and economically active population capable of informed strategic decision-making. Only a small proportion (1.7%) are aged 60 and above, implying limited representation of near-retirement personnel.

Educational attainment is notably high, with 91.7% of respondents holding at least a bachelor's degree, including 41.7% with postgraduate qualifications (master's and PhD). This suggests a highly skilled workforce, enhancing the reliability of responses on managerial and strategic issues. Regarding management level, respondents are fairly evenly distributed across top (31.0%), middle (36.0%), and lower management (33.1%), ensuring balanced perspectives across organisational hierarchies.

In terms of job experience, the majority (58.6%) have over 6 years of experience, indicating substantial industry exposure and institutional knowledge, which strengthens the validity of insights on sustained competitive advantage. Company band distribution is relatively dispersed across ICTA

categories, though slightly concentrated in ICTA 1, 3, and 4, suggesting representation across different firm capacities and regulatory classifications.

In terms of firm size, respondents were drawn from firms ranging from micro and small enterprises (0–49 employees, 65.3%) to larger medium-sized enterprises (50 or more employees, 34.7%, including 14.9% employing more than 100 people); all firms in the sample fall within the WTO's SME threshold of up to 250 employees (WTO, 2017).

## Descriptive Results

### *Technical Skills*

Respondents' technical skills were assessed across three dimensions: ICT functional, analytical, and problem-solving skills, each measured on a 5-point Likert scale. At the subscale level, respondents reported high levels of agreement across all three dimensions, with ICT functional skills recording the highest mean (M = 3.99, SD = 0.67), followed closely by ICT problem-solving skills (M = 3.97, SD = 0.66) and ICT analytical skills (M = 3.87, SD = 0.70). The overall composite technical skills score, computed across all items, was M = 3.94 (SD = 0.63) (Table 2).

*Table 2: Technical Skills*

| Technical Skills Dimension | Mean | SD |
|---|---|---|
| ICT Functional Skills | 3.99 | 0.67 |
| ICT Analytical Skills | 3.87 | 0.70 |
| ICT Problem-Solving Skills | 3.97 | 0.66 |
| **Technical Skills** | 3.94 | 0.63 |

### Sustained Competitive Advantage

Sustained competitive advantage (SCA) was measured across three dimensions: market share growth, superior quality products and services, and brand reputation, each rated on a 5-point Likert scale. At the subscale level, respondents reported consistently high agreement across all three dimensions, with superior quality products and services recording the highest mean (M = 3.88, SD = 0.65), followed closely by brand reputation (M = 3.87, SD = 0.66) and market share growth (M = 3.86, SD = 0.64). The overall composite SCA score, computed across all items, was M = 3.87 (SD = 0.36) (Table 3).

*Table 3: Sustained Competitive Advantage*

| SCA Dimension | Mean | SD |
|---|---|---|
| Market Share Growth | 3.86 | 0.64 |
| Superior Quality Products and Services | 3.88 | 0.65 |
| Brand Reputation | 3.87 | 0.66 |
| **Sustained Competitive Advantage** | 3.87 | 0.36 |

### Regression Analysis

A composite technical skills score (M = 3.94, SD = 0.63), averaging ICT functional, analytical, and problem-solving skills items, was regressed on the composite sustained competitive advantage score (M = 3.87, SD = 0.36). The model was statistically significant, $F(1, 240) = 140.32$, $p < .001$, with technical skills explaining 36.9% of the variance in SCA ($R^2 = 0.369$, Adjusted $R^2 = 0.366$). The regression coefficient for technical skills was positive and significant ($B = 0.344$, $SE = 0.029$, $\beta = 0.607$, $t = 11.846$, $p < .001$, 95% CI [0.287, 0.402]), indicating that a one-unit increase in technical skills is associated with a 0.344-unit increase in SCA. The constant was also significant ($B = 2.510$, $SE = 0.116$, $t = 21.626$, $p < .001$, 95% CI [2.282, 2.739]) (Table 4).

The resulting regression equation is:

SCA = 2.510 + 0.344(Technical Skills)

*Table 4: Regression Model*

| Model Summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
| 1 | .607a | 0.369 | 0.366 | 0.28339 |

| ANOVA | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| 1 | Regression | 11.269 | 1 | 11.269 | 140.319 | .000[b] |
| | Residual | 19.275 | 240 | 0.080 | | |
| | Total | 30.545 | 241 | | | |

| Regression Coefficients | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Model** | | **Unstandardised Coefficients** | | **Standardised Coefficients** | **t** | **Sig.** | **95% CI** |
| | | **B** | **Std. Error** | **Beta** | | | |
| 1 | (Constant) | 2.510 | 0.116 | | 21.626 | .000 | [2.282, 2.739] |
| | Technical Skills | 0.344 | 0.029 | 0.607 | 11.846 | .000 | [0.287, 0.402] |

Dependent Variable: Sustained Competitive Advantage
Predictor: Technical Skills

**Discussion**

The descriptive findings indicate that technical skills were highly developed among managers in IT networking SMEs, with ICT functional skills recording the highest mean score (M = 3.99), followed by ICT problem-solving skills (M = 3.97) and ICT analytical skills (M = 3.87). These findings support the argument that technical competencies are essential resources in technology-intensive industries where organisational performance depends on the effective management of systems, data, and technological infrastructure (Jafari Roodbandi et al., 2025; Mohamed et al., 2024). The uniformly high ratings across all three dimensions suggest that managers possess the technical capabilities necessary to support operational efficiency, service quality, and organisational competitiveness.

Among the three dimensions, ICT functional skills recorded the highest mean, consistent with Dang (2023), who argued that technical expertise enables organisations to optimise system performance and improve operational outcomes, and with D'Souza et al. (2022), who observed that technical effectiveness is enhanced when technical knowledge is integrated with cross-functional coordination. This suggests that managers in IT networking SMEs are able not only to perform technical tasks competently but also to coordinate technical activity across organisational units, a capability critical to maintaining service continuity and system reliability.

ICT analytical skills recorded the lowest overall mean among the three dimensions (M = 3.87), although scores remained relatively high, supporting Mohamed et al. (2024) and Radhika and Li (2024), who emphasised that data-driven decision-making enhances organisational performance. This is consistent with Imjai et al. (2025), who found that analytical effectiveness depends not only on access to information but also on the ability to apply analytical tools and reasoning techniques effectively.

ICT problem-solving skills also recorded a high mean score (M = 3.97), consistent with Weise et al. (2020), who argued that systems-oriented problem-solving is critical in complex, dynamic environments, and with Nicolay et al. (2020), who observed that effective problem-solving enables

organisations to respond proactively to operational challenges. This suggests that managers in IT networking SMEs recognise the interconnected nature of ICT operations and can address problems holistically rather than in isolation.

At the composite level, technical skills (M = 3.94, SD = 0.63) and sustained competitive advantage (M = 3.87, SD = 0.36) were regressed on each other, and the results indicate a statistically significant positive association between the two, $F(1, 240) = 140.32$, $p < .001$. Given the study's single-source, single-instrument, cross-sectional design, without adjustment for common method variance, respondent- or firm-level covariates, or clustering, this association should be read as a modest empirical association rather than strong empirical support for a substantive effect. The relationship (B = 0.344, 95% CI for B [0.287, 0.401]; $\beta = 0.607$, $p < .001$) is directionally consistent with the literature's premise that technical skills are linked to competitive differentiation in the digital economy, with the integrated set of functional, analytical, and problem-solving competencies associated with a meaningful share of variation in SCA among Kenyan IT networking SMEs. The coefficient of determination ($R^2 = 0.369$) offers quantitative support for the theoretical mechanisms proposed in the literature: that technical capabilities enable SMEs to automate tasks, enhance data-driven decision-making, deliver customised solutions, and build collaborative ecosystems that strengthen relational capital and innovation potential (Jafari Roodbandi et al., 2025).

At the same time, technical skills accounted for just over a third of the variance in SCA ($R^2 = 0.369$), leaving 63.1% unexplained. This is consistent with the literature's recognition that many Kenyan SMEs face skill shortages, infrastructure gaps, and limited digital training opportunities that constrain the translation of technical skills into competitive outcomes (KIPPRA, 2023). Effectiveness appears to depend not merely on possessing technical skills but on how they are deployed: Schultz (2020) found that analytical competence's competitive impact depends on contextual deployment rather than mere possession; Imjai et al. (2025) showed that AI literacy moderates the translation of analytical capability into performance, and Hudha et al. (2023) and Lassoueda et al. (2020) similarly found that institutional support and empowerment moderate problem-solving effectiveness. This suggests that the quality and context of technical skill deployment, not just its presence, shape its ultimate contribution to sustained competitive advantage.

**Limitations**

This study is limited by its cross-sectional, single-source, self-reported design, which precludes causal inference, cannot rule out reverse causation or common method bias, and does not adjust for within-firm clustering (1,078 respondents across 365 firms) or the stratified sampling design underlying the Yamane (1967) formula, meaning reported significance levels and margins of error should be read as nominal. Potential moderation by licensing tier or firm size was not tested, and instrument validity was assessed only through Cronbach's alpha, without formal factor-analytic or discriminant validity testing. Finally, findings are restricted to licensed IT networking SMEs in Kenya, and technical skills alone explained only 36.9% of the variance in sustained competitive advantage, indicating that other managerial and contextual factors warrant further investigation; future research should address these constraints through multilevel or cluster-robust estimation, design-effect-adjusted sampling, tier-moderation testing, and formal validity assessment.

**Conclusion**

This study examined the association between a composite measure of technical skills, comprising ICT functional, analytical, and problem-solving skills items, and a composite measure of perceived sustained competitive advantage among IT networking SMEs in Kenya. Regression analysis found a positive and statistically significant association between the two composite measures, with the composite technical skills score accounting for 36.9% of the variance in the composite SCA measure,

leading to rejection of the null hypothesis. These findings contribute to the managerial skills and strategic management literature by extending Katz's (1974) individual-level framework and the Resource-Based View into the under examined context of IT networking SMEs in a developing economy, and suggest that structured investment in managers' technical skill development is a plausible lever for strengthening SME competitiveness alongside the human, conceptual, and contextual factors known to jointly shape SME performance.

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