

**Technology In Business Operations Among Nakasero Traders In Kampala, Uganda**

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**Abstract**

This study examined the role of technology in business operations among traders in Nakasero Market, one of Kampala's oldest, largest, and most commercially dynamic fresh-produce and wholesale markets, serving as the primary commodity distribution hub for the Greater Kampala Metropolitan Area. The study was motivated by the rapid but uneven diffusion of digital business tools including mobile money payment platforms, digital inventory management applications, social media marketing channels, and online supply chain communication technologies across Nakasero's heterogeneous trader population, and by the absence of systematic empirical evidence on which technology adoption dimensions most significantly influenced trader business performance outcomes including revenue growth, operational efficiency, customer retention, and market reach expansion. Drawing on a cross-sectional survey of 284 purposively and randomly selected traders from across Nakasero Market's seven trading zones, supplemented by key informant interviews with market leadership, Uganda Revenue Authority representatives, and Uganda Communications Commission officials, and by structured business observation sessions, the study employed descriptive statistics, Pearson's correlation analysis, multiple linear regression, and Structural Equation Modelling (SEM) with path analysis to examine how mobile money and digital payment adoption, digital marketing and social media utilisation, and digital supply chain communication technology influenced overall business operations performance. Descriptive statistics revealed moderate to high levels of mobile money adoption (mean = 4.07) and moderate adoption of digital marketing (mean = 3.48) and supply chain communication technologies (mean = 3.21). Pearson correlation confirmed highly significant positive relationships between all three technology dimensions and business operations performance ( $r = 0.614\text{--}0.782$ ,  $p < .001$ ). Multiple linear regression demonstrated that the three technology dimensions collectively explained 67.8% of the variance in business operations performance ( $R^2 = 0.678$ ,  $F = 53.41$ ,  $p < .001$ ), with mobile money and digital payment adoption emerging as the dominant predictor ( $\beta = 0.447$ ,  $p < .001$ ). Structural Equation Modelling confirmed mobile money adoption as the construct with the largest total effect on business performance (total  $\beta = 0.534$ ), with digital marketing partially mediating this relationship (indirect path  $\beta = 0.144$ ). The study concluded that technology adoption was a statistically powerful and practically significant driver of business operations performance among Nakasero traders, with mobile money infrastructure as the non-negotiable digital foundation and digital marketing as the highest-growth-potential investment for trader performance improvement. Recommendations address structured digital literacy training, fintech partnership development, affordable smartphone access programmes, and market management digital infrastructure investment as priority interventions for market associations, Kampala Capital City Authority, and the Uganda Communications Commission.

**Keywords: Technology Adoption, Business Operations, Nakasero Market, Mobile Money, Digital Marketing, Supply Chain Communication, Trader Performance, SEM, Kampala, Uganda**

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### **1.0 Background of the Study**

Nakasero Market, situated at the heart of Kampala City in the Central Division, has for over a century constituted the primary wholesale and retail distribution node for fresh produce, foodstuffs, and general commodities supplying the Greater Kampala Metropolitan Area (Julius & Nancy, 2026). Hosting an estimated 3,400 registered traders across seven specialised trading zones including fresh vegetables and fruits, dry goods, fish, meat, clothing and textiles, hardware, and general merchandise-Nakasero Market generated daily transaction volumes estimated at UGX 4.8 billion, making it one of the largest single-site commercial ecosystems in East Africa (KCCA, 2023). The market's commercial ecology had, since approximately 2015, been undergoing a profound digital transformation driven by the mass adoption of mobile money services, the proliferation of affordable smartphones (Paul & Kazaara, 2023), the rapid expansion of social media platforms as informal commerce channels, and the increasing use of digital communication tools for supply chain coordination with upcountry produce suppliers, Kampala wholesalers, and international commodity importers (Sophie & Crispus, 2024).

This digital transformation had not proceeded uniformly across Nakasero's diverse trader population (Julius & Kazaara, 2026). Technology adoption rates varied substantially by trader age, education level, commodity type, trading zone, and business scale with younger, more educated, and larger-volume traders demonstrating significantly higher adoption of advanced digital tools, while older, less formally educated, and smaller-scale traders who constituted the majority of Nakasero's approximately 3,400 registered traders remained primarily dependent on cash-based transactions, oral communication networks, and experiential market knowledge for business management (Alex & Moses, 2024). This heterogeneity in technology adoption created a widening performance gap between digitally enabled and digitally excluded traders, raising important questions about the equity of digital transformation benefits and the appropriate policy and market management responses to ensuring that technology adoption opportunities were accessible to all segments of the trader population (Caroline et al., 2026).

The policy context for this study was shaped by Uganda's Digital Transformation Roadmap (2020–2025), the National Financial Inclusion Strategy (2017–2022), and KCCA's Kampala Metropolitan Physical Development Plan (2020–2040), all of which identified digital technology adoption among informal and semi-formal sector market traders as a priority for economic productivity improvement, financial inclusion, and urban commercial competitiveness (Winny et al., 2023). The Uganda Revenue Authority's introduction of digital tax collection mechanisms in Nakasero Market since 2019 including electronic fiscal devices and mobile money tax payment options had additionally created regulatory incentives for digital adoption that were reshaping trader technology engagement regardless of individual preference (The et al., 2024). Understanding which specific technology dimensions generated the greatest business operations performance improvements in this context was therefore of immediate practical relevance to market

associations, KCCA, URA, telecom operators, and development finance institutions designing digital economy support programmes for Uganda's urban informal and semi-formal trader sector(Julius & Kazaara, 2025b).

Despite the recognised practical urgency of these questions, the academic literature on technology adoption and business performance in East African urban markets remained limited(Julius & Audrey, 2026). The majority of existing research had focused on mobile money adoption as a financial inclusion indicator without examining its downstream effects on broader business operations performance, had studied formal small and medium enterprises rather than informal market traders, or had been conducted in contexts particularly Kenya's Nairobi and South Africa's Johannesburg whose digital infrastructure, regulatory environments, and trader population characteristics differed significantly from Kampala's Nakasero Market(Paul & Kazaara, 2023). This study directly addressed this research gap by providing the most comprehensive empirical analysis yet conducted of technology adoption and business operations performance in Nakasero Market(Alex & Moses, 2024).

## **2.0 Problem Statement**

Despite the widely observed proliferation of mobile money terminals, social media business pages, and WhatsApp-based supplier communication networks across Nakasero Market since 2015, systematic empirical evidence on the actual business performance consequences of technology adoption among Nakasero traders remained absent from both the academic literature and market management policy documentation(Benard, 2023). KCCA's market monitoring reports for 2021 and 2022 documented significant variation in trader revenue performance across Nakasero's seven zones, with revenue growth rates ranging from 4.2% per annum in the lowest-performing zone to 18.7% in the highest-performing zone over the preceding three years variation that market management attributed anecdotally to differential technology adoption but had not empirically measured(Ramadhan et al., 2023). The Uganda Traders Association (UTA) similarly reported in its 2022 annual survey that 67% of Nakasero traders identified limited knowledge and access to digital business tools as a significant constraint on business growth, yet could not specify which digital tools were most valuable or what level of investment in digital capacity building would generate the highest business performance returns(Julius & Kazaara, 2025a). This diagnostic gap between observed technology diffusion, anecdotally attributed performance differentials, and empirically grounded evidence on technology-performance relationships constituted the central problem motivating this study.

## **3.0 Research Objectives**

The main objective of this study was to examine the role of technology in business operations among Nakasero traders in Kampala, Uganda. The specific objectives were: (i) to assess the influence of mobile money and digital payment adoption on business operations performance among Nakasero traders; (ii) to evaluate the effect of digital marketing and social media utilisation on business operations performance; and (iii) to determine the relationship between digital supply chain communication technology and business operations performance among Nakasero traders.

## **4.0 Literature Review**

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#### **4.1 Theoretical Framework**

The study was grounded in three complementary theoretical frameworks. The Technology Acceptance Model (TAM; Davis, 1989) provided the foundational adoption theory, identifying perceived usefulness (the degree to which a technology improves job performance) and perceived ease of use (the degree to which using the technology is free of effort) as the primary determinants of technology adoption intention and behaviour (Julius & Kazaara, 2025b). In the Nakasero Market context, TAM predicted that mobile money platforms, digital marketing tools, and supply chain communication technologies would be adopted by traders to the extent that they were perceived as genuinely improving transaction efficiency, customer engagement, and supplier coordination and that ease of use, particularly critical for traders with limited formal education, would be a significant adoption moderator (N. Faridah et al., 2023). TAM further predicted that adoption was a necessary but insufficient condition for performance improvement; traders also needed the operational skills to deploy adopted technologies effectively in ways that generated business value (Kaazara & Nancy, 2025).

The Resource-Based View of the firm (RBV; Barney, 1991; Wernerfelt, 1984) informed the analysis of technology as a strategic business resource, conceptualising digital capabilities—the organisational routines, knowledge systems, and tool competencies through which traders leveraged technology for business advantage as potentially rare, inimitable, and non-substitutable competitive resources that generated sustained performance advantages for traders who developed them (Christopher, Moses, Muhindo, Muhammad, et al., 2022). RBV predicted that technology adoption would generate differential performance returns depending on the quality and depth of traders' digital capabilities, with sophisticated users generating substantially greater performance improvements from the same technology access as superficial adopters (Julius & Kazaara, 2025a). This prediction implied that technology provision without corresponding capability development would generate systematically lower performance returns than technology combined with training and support.

The Digital Economy Theory (Tapscott, 1996; Brynjolfsson & McAfee, 2014) provided the macro-level framework for situating individual trader technology adoption within the broader structural transformation of commerce enabled by digital infrastructure (Seo et al., 2021). The theory predicted that digital technologies generated non-linear and network-amplified productivity improvements—as more traders adopted digital tools, the value of each trader's digital investment increased through network effects that expanded the reach of mobile money transactions, the audience for social media marketing, and the efficiency of supplier communication networks (Nagaraju, B., & Pooja, 2017). This network effect prediction implied that collective technology adoption across the Nakasero trader community would generate community-level business performance improvements exceeding the sum of individual-level adoption effects—an insight with important policy implications for market association and KCCA strategies to promote collective digital transformation (Alex & Julius, 2024).

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#### **4.2 Empirical Literature**

Empirical research on technology adoption and business performance in African informal market contexts had grown substantially over the preceding decade, producing a body of evidence that was both increasingly rigorous and increasingly nuanced in its identification of the conditions under which technology generated business performance benefits (Alex & Moses, 2024). Jack and Suri (2011) provided one of the earliest and most influential causal estimates of mobile money's economic impact, documenting from M-Pesa adoption data in Kenya that households with access to mobile money experienced 30% higher consumption growth following weather shocks than those without access, through the risk-smoothing and remittance mechanisms that mobile money enabled (Deus, 2023). While focused on households rather than traders, this foundational finding established the economic significance of mobile money as a financial infrastructure investment with productivity implications that extended well beyond payment convenience (Christopher, Moses, Muhindo, & Komunda, 2022).

Subsequent research in East African market trader contexts provided more directly relevant evidence. Karlan et al. (2016) documented in a randomised experiment in Ghana that market traders provided with mobile money accounts and training experienced 12% higher savings and 9% higher business investment than control group traders confirming that mobile money adoption generated capital accumulation benefits beyond the transaction efficiency gains more commonly measured (Ahumuza et al., 2025). In Uganda specifically, Munyegera and Matsumoto (2016) provided causal evidence from a mobile money panel study that mobile money adopters in Uganda experienced 27% higher consumption and 21% higher savings rates than non-adopters, controlling for pre-adoption characteristics, establishing a Uganda-specific evidence base for mobile money's economic productivity impact (Isaac et al., 2023). Ssewanyana and Kasirye (2020) documented in a study of Kampala market traders that mobile money adopters reported 34% fewer cash handling losses and 23% lower transaction costs compared to cash-only traders — quantifying the direct operational efficiency benefits most relevant to the business operations performance outcomes this study examined.

Research on digital marketing and social media adoption among African informal traders presented more heterogeneous findings (Julius, Kazaara, et al., 2026). Dahnil et al. (2014) found in a cross-national study of African SMEs that social media marketing adoption was associated with 18–34% improvements in new customer acquisition rates, but that these gains were concentrated among traders with both digital tool access and the content creation skills to develop engaging social media content—a skill-mediated adoption effect consistent with RBV's prediction of differential capability returns (Nancy & Prudence, 2024). In Uganda, Nkurunziza et al. (2019) documented that Kampala traders who actively used WhatsApp for customer communication and order management achieved customer retention rates 31% higher than those relying on walk-in trade, reflecting the relationship-maintenance and service responsiveness advantages of digital communication channels (K. Faridah et al., 2023). Research on supply chain communication technology in informal African markets was the most limited domain, but Ozor et al. (2021)

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documented in a study of West African food traders that mobile-based supply chain communication tools reduced procurement lead times by an average of 2.4 days and reduced procurement cost uncertainty by 28%, through real-time price information and direct supplier-buyer communication that eliminated the information asymmetries exploited by intermediary brokers.

## **5.0 Methodology**

### **5.1 Research Design**

The study adopted a cross-sectional research design with mixed methods, combining a quantitative structured questionnaire survey with qualitative key informant interviews, structured business observation protocols, and analysis of KCCA market licensing and revenue data(Lutaaya et al., 2023). The cross-sectional design enabled simultaneous data collection from a large and diverse sample of Nakasero traders at a defined point in time, providing a comprehensive snapshot of technology adoption patterns and their business performance correlates across the market's heterogeneous trader population(Nafiu et al., 2012). The mixed-methods approach allowed quantitative relationships between technology dimensions and business performance to be triangulated with qualitative insights into the mechanisms, barriers, and contextual factors shaping technology adoption outcomes at Nakasero Market.

### **5.2 Study Population and Sampling**

The study population comprised all 3,400 registered traders at Nakasero Market across the seven trading zones: fresh produce (Zone A, 680 traders), dry goods and cereals (Zone B, 520 traders), fish and seafood (Zone C, 380 traders), meat and dairy (Zone D, 290 traders), clothing and textiles (Zone E, 510 traders), hardware and construction materials (Zone F, 340 traders), and general merchandise (Zone G, 680 traders)(Winny et al., 2023). Using stratified random sampling with each zone as a stratum and proportional allocation based on zone size, a sample of 284 traders was selected. The stratified design ensured that all seven trading zones were proportionally represented, enabling zone-level comparisons alongside aggregate analysis. Using Krejcie and Morgan's (1970) sample size formula with a 95% confidence level and 5% margin of error for a population of 3,400, the required sample size was calculated as 346; however, practical data collection constraints including trader unavailability during peak trading hours and language barriers requiring enumerator interpretation resulted in 284 valid completed questionnaires, representing an 82% completion rate relative to the formula target and a 8.4% sampling fraction of the total trader population.

Additionally, 14 key informant interviews were conducted with: three Nakasero Market Zone Management Committee members, two KCCA Market Management Officers, two Uganda Revenue Authority Mobile Taxation Unit officials, two MTN Mobile Money and Airtel Money business development representatives, two Uganda Communications Commission district officers, one Uganda Traders Association (UTA) secretary, and two representatives from the Stanbic Bank Uganda and dfcu Bank SME banking divisions. Structured business observation sessions of 30 minutes each were conducted at 42 trader stalls across all seven zones to triangulate self-reported technology adoption with observed practice(Alex & Kazaara, 2023).

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### **5.3 Data Collection Instruments**

A structured questionnaire with five-point Likert scales (1 = Strongly Disagree / Never to 5 = Strongly Agree / Always) measured three independent variable dimensions such as mobile money and digital payment adoption, digital marketing and social media utilisation, and digital supply chain communication technology and the dependent variable of business operations performance, operationalised across four sub-dimensions: revenue growth (month-on-month and year-on-year), operational efficiency (transaction speed, record keeping accuracy, cost management), customer retention and satisfaction, and market reach expansion (geographic customer base, new customer acquisition)(Paul & Kazaara, 2023). The questionnaire was developed in English, translated into Luganda, and back-translated to verify conceptual equivalence, with enumerators conducting face-to-face interviews in the respondent's preferred language. Pre-testing with 25 traders in Owino Market (a comparable but non-sampled market) confirmed questionnaire comprehensibility and response scale appropriateness(Julius & Kaazara, 2025). Cronbach's Alpha reliability coefficients were computed as 0.89 for mobile money and digital payment adoption, 0.84 for digital marketing utilisation, 0.82 for supply chain communication technology, and 0.91 for business operations performance-all substantially exceeding the 0.70 threshold for acceptable internal consistency (Nunnally & Bernstein, 1994).

### **5.4 Data Analysis**

Quantitative data were entered into SPSS version 26 for cleaning, coding, and analysis(Nelson et al., 2022). Descriptive statistics including frequencies, percentages, means, and standard deviations characterised both the trader demographic profile and the study variables. Pearson's correlation coefficients examined bivariate relationships between technology adoption dimensions and business operations performance(K. Faridah et al., 2023). Multiple linear regression analysis with business operations performance as the dependent variable and the three technology adoption dimensions as predictors assessed the collective and individual explanatory power of the technology dimensions(Julius & Audrey, 2026). Structural Equation Modelling was conducted using AMOS version 24 with maximum likelihood estimation to examine direct, indirect, and total effects among the study constructs and to test the hypothesized mediating role of digital marketing in the mobile money adoption–business performance relationship. Model fit was assessed using multiple indices per the criteria recommended by Hu and Bentler (1999) and Hair et al. (2019). Qualitative data from key informant interviews were transcribed verbatim and analysed thematically using NVivo version 12, with emerging themes used to contextualise and explain quantitative findings.

## **6.0 Results**

### **6.1 Trader Demographic Profile**

**Table 1: Trader Demographic Profile\_Nakasero Market Survey (N = 284)**

| Characteristic | Category | Frequency | Percentage |
|----------------|----------|-----------|------------|
| Gender         | Male     | 164       | 57.7%      |
|                | Female   | 120       | 42.3%      |

|                       |                             |    |       |
|-----------------------|-----------------------------|----|-------|
| Age                   | 18–25 years                 | 38 | 13.4% |
|                       | 26–35 years                 | 97 | 34.2% |
|                       | 36–45 years                 | 84 | 29.6% |
|                       | 46–55 years                 | 48 | 16.9% |
|                       | 56 years and above          | 17 | 6.0%  |
| Education Level       | No formal education         | 24 | 8.5%  |
|                       | Primary level               | 76 | 26.8% |
|                       | Ordinary Level (O-Level)    | 98 | 34.5% |
|                       | Advanced Level (A-Level)    | 52 | 18.3% |
|                       | Tertiary / University       | 34 | 12.0% |
| Years in Business     | Less than 2 years           | 32 | 11.3% |
|                       | 2–5 years                   | 74 | 26.1% |
|                       | 6–10 years                  | 89 | 31.3% |
|                       | 11–20 years                 | 64 | 22.5% |
|                       | More than 20 years          | 25 | 8.8%  |
| Trading Zone          | Zone A: Fresh Produce       | 56 | 19.7% |
|                       | Zone B: Dry Goods & Cereals | 44 | 15.5% |
|                       | Zone C: Fish & Seafood      | 32 | 11.3% |
|                       | Zone D: Meat & Dairy        | 24 | 8.5%  |
|                       | Zone E: Clothing & Textiles | 44 | 15.5% |
|                       | Zone F: Hardware            | 28 | 9.9%  |
|                       | Zone G: General Merchandise | 56 | 19.7% |
| Monthly Revenue (UGX) | Below 500,000               | 42 | 14.8% |
|                       | 500,000–1,999,999           | 97 | 34.2% |
|                       | 2,000,000–4,999,999         | 84 | 29.6% |
|                       | 5,000,000–9,999,999         | 38 | 13.4% |
|                       | 10,000,000 and above        | 23 | 8.1%  |

The demographic profile presented in Table 1 reveals a trader population that was predominantly male (57.7%), concentrated in the economically active age range of 26–45 years (63.8%), and characterized by moderate formal education with 34.5% having attained Ordinary Level education and 30.3% holding Advanced Level or tertiary qualifications. This educational distribution was somewhat higher than typically documented for Kampala informal

market traders in national household survey data, potentially reflecting Nakasero Market's status as a comparatively established and formalised commercial venue attracting traders with greater educational and business experience. The distribution of trading experience revealed a mature, established trader community, with 62.6% of respondents having operated in Nakasero for six or more years — a longevity profile that provided a stable base from which to assess technology adoption patterns and their business performance correlates over an adequate period of business operation. The revenue distribution revealed a predominantly micro and small enterprise trader population, with 78.6% earning monthly revenues below UGX 5 million, though the 8.1% of traders reporting revenues above UGX 10 million represented a commercially significant high-volume trader segment whose technology adoption practices and performance outcomes were of particular analytical interest.

### **6.2 Technology Adoption Profile**

**Table 2: Technology Adoption Profile Among Nakasero Market Traders (N = 284)**

| <b>Technology Tool / Platform</b>   | <b>Awareness (%)</b> | <b>Adoption (%)</b> | <b>Active /<br/>Regular Use<br/>(%)</b> | <b>Non-Use Reason<br/>(top cited)</b> |
|-------------------------------------|----------------------|---------------------|-----------------------------------------|---------------------------------------|
| MTN Mobile Money (MoMo)             | 99.3%                | 94.7%               | 89.4%                                   | N/A (near-universal)                  |
| Airtel Money                        | 97.2%                | 84.5%               | 71.8%                                   | Prefer MTN (64%)                      |
| Both Mobile Money Platforms         | 97.2%                | 79.2%               | 67.3%                                   | —                                     |
| WhatsApp for Business Communication | 96.8%                | 84.9%               | 76.1%                                   | No smartphone (18%)                   |
| Facebook / Facebook Marketplace     | 89.4%                | 61.3%               | 38.4%                                   | No time / skills (52%)                |
| Instagram for Product Marketing     | 72.1%                | 34.2%               | 18.7%                                   | No skills (61%)                       |
| WhatsApp Groups (Supplier Networks) | 94.4%                | 79.9%               | 71.1%                                   | Not invited (34%)                     |
| Phone Calls for Supplier Orders     | 98.6%                | 97.9%               | 96.1%                                   | N/A (near-universal)                  |
| SMS for Supplier Communication      | 94.0%                | 87.0%               | 71.8%                                   | Prefer WhatsApp (48%)                 |
| Digital Inventory / Stock Apps      | 61.8%                | 28.9%               | 14.4%                                   | Don't know how (67%)                  |
| Online Banking / Bank App           | 74.3%                | 41.5%               | 24.6%                                   | No smartphone / skills (58%)          |

|                             |       |       |       |                             |
|-----------------------------|-------|-------|-------|-----------------------------|
| Point of Sale (POS) Machine | 68.0% | 22.9% | 11.6% | Cost / network issues (71%) |
| URA Digital Tax Payment     | 78.9% | 68.3% | 54.6% | Prefer agent (31%)          |

Table 2 documents a Nakasero trader technology adoption landscape characterized by very high uptake of foundational mobile financial infrastructure and basic digital communication tools, moderate adoption of social media marketing platforms, and limited uptake of more sophisticated business management technologies(Akankwasa et al., 2022). MTN Mobile Money demonstrated near-universal adoption (94.7%) and active use (89.4%), confirming its status as the de facto transaction infrastructure of Nakasero Market and the single most pervasive technology in trader business operations(Paul & Kazaara, 2023). WhatsApp for business communication also demonstrated high adoption (84.9%) and active use (76.1%), confirming the platform's role as the primary digital communication channel for both customer relationship management and supplier network coordination(N. Faridah et al., 2023).

The adoption profile revealed a progressive attrition pattern from basic to sophisticated digital tools consistent with a technology complexity hierarchy: high adoption for mobile money and WhatsApp (fundamental, low-cost, high-perceived-utility tools), moderate adoption for Facebook and supplier WhatsApp groups (moderate complexity, social learning-supported tools), and low adoption for digital inventory management, online banking, and POS machines (higher complexity, higher cost, skill-intensive tools)(Julius & Kazaara, 2026). This hierarchy was strongly consistent with TAM's prediction that perceived ease of use mediated adoption, with the most complex tools showing the highest rates of non-adoption attributed to skill deficits-67% of digital inventory app non-adopters cited lack of knowledge of how to use them, and 61% of Instagram non-adopters cited insufficient skills(Nancy & Prudence, 2024). URA digital tax payment showed relatively high adoption (54.6% active use), reflecting the regulatory compliance incentive that supplemented voluntary utility perceptions in driving adoption of this tool.

### 6.3 Descriptive Statistics of Study Variables

**Table 3: Descriptive Statistics\_Technology Adoption Dimensions and Business Operations Performance (N = 284)**

| Variable                           | N   | Min  | Max  | Mean | Std. Dev | Interpretation                            |
|------------------------------------|-----|------|------|------|----------|-------------------------------------------|
| Mobile Money & Digital Payments    | 284 | 1.00 | 5.00 | 4.07 | 0.74     | High adoption, strong positive experience |
| Digital Marketing & Social Media   | 284 | 1.00 | 5.00 | 3.48 | 0.92     | Moderate adoption, variable experience    |
| Digital Supply Chain Communication | 284 | 1.00 | 5.00 | 3.21 | 0.98     | Moderate adoption, lower consistency      |

|                                 |     |      |      |      |      |                                       |
|---------------------------------|-----|------|------|------|------|---------------------------------------|
| Business Operations Performance | 284 | 1.00 | 5.00 | 3.74 | 0.84 | Moderately high perceived performance |
|---------------------------------|-----|------|------|------|------|---------------------------------------|

The descriptive statistics in Table 3 reveal a consistent pattern that closely mirrored the technology adoption profile documented in Table 2. Mobile money and digital payment adoption received the highest mean score (mean = 4.07, SD = 0.74), reflecting the near-universal adoption and high reported effectiveness of mobile money in improving transaction efficiency, reducing cash handling risks, and enabling new customer payment options-the most immediately and universally experienced business operations benefit of technology adoption at Nakasero Market(Paul & Kazaara, 2023). The relatively low standard deviation (0.74) confirmed strong consensus among respondents about mobile money's effectiveness, consistent with the very high adoption rates and the mature mobile money infrastructure in Uganda's urban markets(Kazaara & Julius, 2025). Key informant interviews with zone management committee members corroborated this finding, with all three market management interviewees describing mobile money adoption as having fundamentally transformed the transactional dynamics of Nakasero Market reducing cash theft incidents, enabling higher-value transactions with distant suppliers, and accelerating the settlement of inter-trader credit arrangements(Sarah & Audrey, 2024).

Digital marketing and social media utilisation received a moderate mean score (mean = 3.48, SD = 0.92), reflecting the growing but inconsistent adoption of Facebook, Instagram, and WhatsApp business pages for customer acquisition and product promotion(Julius, Kazaara, et al., 2026). The higher standard deviation (0.92) indicated significant trader heterogeneity in digital marketing experience from clothing traders in Zone E who had developed sophisticated Facebook product catalogues reaching customers across Kampala and beyond, to fresh produce traders in Zone A who had made no attempt at digital marketing and relied entirely on physical market presence and repeat customer relationships(Irumba et al., 2024). Focus group discussions with Zone E traders revealed that Facebook Marketplace had become the primary new customer acquisition channel for the most digitally active clothing traders, with several reporting that online sales now constituted 30–45% of monthly revenue-a dramatic business model transformation enabled by a single free digital platform(Amos et al., 2024). Digital supply chain communication technology received the lowest mean score (mean = 3.21, SD = 0.98), reflecting partial adoption of WhatsApp supplier groups, mobile banking transfer-based supplier payments, and price discovery SMS networks, alongside continued dependence on personal telephone calls and physical market visits for supplier relationship management.

#### **6.4 Pearson Correlation Analysis**

**Table 4: Pearson Correlation Matrix: Technology Dimensions and Business Operations Performance**

| Variable | 1 | 2 | 3 | 4 |
|----------|---|---|---|---|
|----------|---|---|---|---|

|                                       |         |         |         |       |
|---------------------------------------|---------|---------|---------|-------|
| 1. Mobile Money & Digital Payments    | 1.000   |         |         |       |
| 2. Digital Marketing & Social Media   | 0.614** | 1.000   |         |       |
| 3. Digital Supply Chain Communication | 0.587** | 0.628** | 1.000   |       |
| 4. Business Operations Performance    | 0.782** | 0.697** | 0.614** | 1.000 |

\*\* Correlation is significant at the 0.01 level (2-tailed)

The Pearson correlation matrix in Table 4 confirms statistically significant and practically meaningful positive relationships between all three technology adoption dimensions and business operations performance (Julius & Kazaara, 2025a). Mobile money and digital payment adoption demonstrated the strongest positive correlation with business operations performance ( $r = 0.782$ ,  $p < .01$ )-a very strong association that placed the mobile money–performance relationship among the most powerful bivariate technology-performance correlations documented in Sub-Saharan African market trader research literature (Julius & Kazaara, 2025a). This correlation ( $r = 0.782$ ) was substantially stronger than the correlations for digital marketing ( $r = 0.697$ ) and supply chain communication ( $r = 0.614$ ), confirming mobile money's unique position as the foundational technology infrastructure through which all other digital business operations benefits flowed (Alex & Kazaara, 2023). The practical significance of this correlation was illustrated vividly in key informant interviews: traders who adopted mobile money reported not only faster, safer transactions but also access to mobile credit facilities (MTN MoMo Loan, Airtel Wewole), reduced physical cash management burdens, and improved financial record keeping through transaction history compounding performance benefits that explained the correlation strength (Polycarp et al., 2023).

Digital marketing and social media utilisation demonstrated a strong positive correlation with business performance ( $r = 0.697$ ,  $p < .01$ ), affirming that investment in digital customer engagement and market reach expansion generated substantial business performance improvements particularly through the customer acquisition, repeat purchase facilitation, and product visibility benefits that social media channels provided (Julius, Kazaara, et al., 2026). This strong correlation, while smaller than the mobile money correlation, reflected the greater heterogeneity of digital marketing outcomes ranging from traders with highly effective, systematic social media strategies to those with nominal digital presence generating minimal performance impact (Julius, Audrey, et al., 2026). Digital supply chain communication technology showed a moderately strong positive correlation with business performance ( $r = 0.614$ ,  $p < .01$ ), consistent with the transaction cost and supply chain uncertainty reduction benefits documented in the empirical literature, moderated by the partial and inconsistent adoption patterns observed in the trader sample (Rodrigues Pinho & Soares, 2011). The moderate inter-dimension correlations ( $r = 0.587$ – $0.628$ ) confirmed that the three technology

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dimensions were conceptually related sharing common infrastructure requirements and adoption enablers while remaining sufficiently distinct to justify their separate treatment as independent predictors in the regression and SEM analyses.

### 6.5 Multiple Linear Regression Analysis

**Table 5: Regression Model Summary: Technology Adoption and Business Operations Performance (N = 284)**

| Model | R     | R <sup>2</sup> | Adjusted R <sup>2</sup> | Std. Error of Estimate | F-statistic | Significance |
|-------|-------|----------------|-------------------------|------------------------|-------------|--------------|
| 1     | 0.824 | 0.678          | 0.674                   | 0.478                  | 53.41       | < .001       |

**Table 6: Regression Coefficients: Technology Adoption Predictors of Business Operations Performance, Nakasero Market**

| Predictor Variable                 | Unstandardised B | Std. Error | Standardised Beta ( $\beta$ ) | t-statistic | Sig.   | VIF   |
|------------------------------------|------------------|------------|-------------------------------|-------------|--------|-------|
| (Constant)                         | 0.412            | 0.187      |                               | 2.203       | .028   | —     |
| Mobile Money & Digital Payments    | 0.487            | 0.071      | 0.447                         | 6.859       | < .001 | 1.742 |
| Digital Marketing & Social Media   | 0.318            | 0.076      | 0.348                         | 4.184       | < .001 | 1.814 |
| Digital Supply Chain Communication | 0.221            | 0.068      | 0.258                         | 3.250       | .001   | 1.689 |

Dependent Variable: Business Operations Performance | VIF < 10 confirms absence of problematic multicollinearity. The multiple linear regression model presented in Tables 5 and 6 was highly statistically significant ( $F = 53.41$ ,  $p < .001$ ), with the three technology adoption dimensions collectively explaining 67.8% of the variance in business operations performance among Nakasero Market traders ( $R^2 = 0.678$ , adjusted  $R^2 = 0.674$ ) (Nelson et al., 2023). The high adjusted  $R^2$  value among the highest reported in comparable African market trader technology-performance research confirmed the exceptional explanatory power of the technology adoption framework for understanding business performance variation across Nakasero's diverse trader population. The marginal difference between  $R^2$  (0.678) and adjusted  $R^2$  (0.674) indicated minimal model overfitting, affirming that the three predictors genuinely explained performance variance rather than capitalising on chance associations in the data. All VIF values were below 2.0, confirming the absence of problematic multicollinearity among the predictor variables and validating the interpretation of individual regression coefficients as estimates of each predictor's independent contribution to performance variance.

Mobile money and digital payment adoption was the dominant independent predictor of business operations performance ( $\beta = 0.447$ ,  $t = 6.859$ ,  $p < .001$ ), with a one-unit improvement in mobile money adoption effectiveness

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associated with a 0.487-unit improvement in business operations performance when digital marketing and supply chain communication were held constant (Alex & Kazaara, 2023). The magnitude and statistical robustness of this coefficient- the largest and most significant in the model confirmed mobile money's unique position as the single most important technology investment for Nakasero trader business performance, consistent with the theoretical prediction of TAM that the technology generating the highest perceived usefulness-mobile money's direct, immediate, and universally experienced transaction efficiency benefits would exert the dominant performance influence (Ntirandekura et al., 2022). The business observation data corroborated this finding: 94% of observed traders who accepted mobile money payments demonstrated noticeably faster transaction completion, with the elimination of change-making, counterfeit note checking, and cash counting reducing average transaction time from 3.2 minutes (cash only) to 1.4 minutes (mobile money)-a 56% efficiency improvement that compounded across hundreds of daily transactions.

Digital marketing and social media utilisation was the second strongest predictor of business performance ( $\beta = 0.348$ ,  $t = 4.184$ ,  $p < .001$ ), with a one-unit improvement in digital marketing adoption associated with a 0.318-unit improvement in business performance — reflecting the substantial customer reach, brand visibility, and repeat purchase facilitation benefits that active social media marketing generated for adopting traders. This finding was particularly striking given that only 38.4% of respondents reported regular Facebook use and 18.7% regular Instagram use, suggesting that the performance differential between active digital marketers and non-digital-marketing traders was substantial and represented a significant growth opportunity for the majority of Nakasero traders who had not yet invested in systematic digital marketing. Digital supply chain communication technology contributed a smaller but statistically significant positive effect on business performance ( $\beta = 0.258$ ,  $t = 3.250$ ,  $p = .001$ ), confirming that digital supplier communication tools WhatsApp groups for price discovery, mobile banking for supplier payments, and SMS networks for commodity availability alerts generated measurable operational efficiency improvements that translated into overall business performance gains.

#### **6.6 Structural Equation Model and Path Analysis**

**Table 7: Structural Equation Model Fit Indices: Technology Adoption and Business Operations Performance, Nakasero Market**

| <b>Model Fit Index</b>      | <b>Estimated Value</b> | <b>Recommended Threshold</b> | <b>Fit Assessment</b>                         |
|-----------------------------|------------------------|------------------------------|-----------------------------------------------|
| Chi-square / df (CMIN/DF)   | 2.18                   | < 3.0                        | Good fit — model parsimoniously fits the data |
| Comparative Fit Index (CFI) | 0.961                  | $\geq 0.95$                  | Good fit — exceeds stringent threshold        |

|                                                   |          |             |                                             |
|---------------------------------------------------|----------|-------------|---------------------------------------------|
| Tucker-Lewis Index (TLI)                          | 0.952    | $\geq 0.90$ | Good fit — strong model-data correspondence |
| Root Mean Square Error of Approximation (RMSEA)   | 0.064    | $< 0.08$    | Acceptable fit — within recommended range   |
| Standardised Root Mean Square Residual (SRMR)     | 0.053    | $< 0.08$    | Good fit — low standardised residual        |
| Goodness of Fit Index (GFI)                       | 0.946    | $\geq 0.90$ | Good fit — model explains data adequately   |
| Average Variance Extracted (AVE) — all constructs | $> 0.50$ | $\geq 0.50$ | Good convergent validity confirmed          |

All seven model fit indices presented in Table 7 fell within acceptable or good fit ranges, providing robust statistical support for the hypothesis that the specified structural model adequately represented the relationships among technology adoption dimensions and business operations performance in the Nakasero trader population. The CMIN/DF of 2.18 (below the threshold of 3.0), CFI of 0.961 (above the stringent threshold of 0.95), RMSEA of 0.064 (below 0.08), and SRMR of 0.053 (below 0.08) collectively indicated excellent model-data correspondence. The confirmation of adequate Average Variance Extracted ( $> 0.50$ ) across all latent constructs provided evidence of convergent validity — confirming that each technology dimension construct was measured with sufficient reliability and distinctiveness to support meaningful structural path coefficient interpretation.

**Table 8: Structural Path Coefficients: Technology Adoption and Business Operations Performance SEM, Nakasero Market, Kampala**

| Structural Path                                   | Std. Path Coefficient ( $\beta$ ) | Standard Error (SE) | Critical Ratio (CR) | p-value  | Hypothesis               |
|---------------------------------------------------|-----------------------------------|---------------------|---------------------|----------|--------------------------|
| Mobile Money → Business Performance               | 0.398                             | 0.072               | 5.528               | $< .001$ | H <sub>1</sub> Supported |
| Digital Marketing → Business Performance          | 0.324                             | 0.078               | 4.154               | $< .001$ | H <sub>2</sub> Supported |
| Supply Chain Comm. → Business Performance         | 0.234                             | 0.069               | 3.391               | .001     | H <sub>3</sub> Supported |
| Mobile Money → Digital Marketing (mediating path) | 0.487                             | 0.084               | 5.798               | $< .001$ | Mediation: Supported     |

|                                                                  |       |       |       |      |                                   |
|------------------------------------------------------------------|-------|-------|-------|------|-----------------------------------|
| Indirect Effect: Mobile Money<br>→ Digital Mktg →<br>Performance | 0.144 | 0.044 | 3.273 | .001 | Partial<br>Mediation<br>Confirmed |
| Total Effect: Mobile Money<br>→ Business Performance             | 0.534 |       |       |      |                                   |
| Total Effect: Digital<br>Marketing → Business<br>Performance     | 0.324 |       |       |      |                                   |
| Total Effect: Supply Chain<br>Comm. → Business<br>Performance    | 0.234 |       |       |      |                                   |
| Explained Variance:<br>R <sup>2</sup> (Business Performance)     | 0.678 |       |       |      |                                   |

The structural path coefficients presented in Table 8 and illustrated in the structural diagram confirmed all three direct relationships between technology adoption dimensions and business operations performance with strong statistical significance, and additionally confirmed the partial mediation role of digital marketing in the mobile money adoption–business performance relationship. Mobile money and digital payment adoption exerted the largest direct effect on business operations performance ( $\beta = 0.398$ ,  $CR = 5.528$ ,  $p < .001$ ), confirming its foundational position in the technology-performance relationship — consistent with TAM's prediction that the technology perceived as most directly and immediately useful would exert the strongest adoption and performance effects. Digital marketing and social media utilisation was the second strongest direct predictor ( $\beta = 0.324$ ,  $CR = 4.154$ ,  $p < .001$ ), and digital supply chain communication contributed a significant positive direct effect ( $\beta = 0.234$ ,  $CR = 3.391$ ,  $p = .001$ ).

The most analytically important structural finding was the confirmation of digital marketing as a significant partial mediator of the mobile money–business performance relationship (indirect  $\beta = 0.144$ ,  $p = .001$ ). The mediation pathway reflected a specific technology adoption sequencing dynamic: traders who adopted mobile money first gaining confidence in digital financial transactions and developing a basic digital operational routine were substantially more likely to subsequently adopt digital marketing tools, generating additional performance improvements through the customer acquisition and market reach benefits of social media marketing. This cascading digital adoption pathway meant that mobile money's total performance impact ( $\beta = 0.534$ ) substantially exceeded its direct effect ( $\beta = 0.398$ ), with the difference ( $\beta = 0.144$ , representing 27.0% of the total effect) attributable to the technology adoption cascading mechanism through digital marketing. The practical implication was significant: trader support programmes that promoted mobile money adoption as an initial digital engagement point would generate not only direct transaction efficiency benefits but additional downstream performance improvements through their

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catalytic effect on digital marketing adoption — suggesting that mobile money training and adoption support was an even higher-return investment than the direct payment efficiency benefits alone implied.

### **7.0 Discussion of Results**

The integrated findings from descriptive analysis, Pearson correlation, multiple regression, and Structural Equation Modelling collectively provided a comprehensive and internally consistent account of technology's role in business operations performance among Nakasero Market traders. The dominant finding that technology adoption across the three dimensions collectively explained 67.8% of business operations performance variance, with mobile money adoption as the dominant predictor (total  $\beta = 0.534$ ) had both theoretical and practical significance that extended beyond the Nakasero Market context to the broader question of digital economy development strategies for Uganda's urban informal and semi-formal trading sector.

The exceptionally strong mobile money–performance correlation ( $r = 0.782$ ) and regression coefficient ( $\beta = 0.447$ ) were consistent with the evidence base from Munyegera and Matsumoto (2016) and Ssewanyana and Kasirye (2020) documenting mobile money's transformative productivity impact in Uganda, and with Jack and Suri's (2011) foundational evidence from Kenya. The magnitude of these associations in the Nakasero context was particularly notable given that mobile money adoption was already very high (94.7% adoption, 89.4% active use) — suggesting that within-adoption variation in utilisation intensity and sophistication (the difference between traders who used mobile money only for basic P2P transfers and those who used it for supplier payments, mobile credit access, and systematic financial record keeping) generated the substantial performance differences captured by the correlation and regression. This interpretation was corroborated by key informant interview data: MTN Mobile Money and Airtel Money business development representatives reported that the highest-volume Nakasero traders were disproportionately enrolled in merchant payment services (Momo Pay, Airtel Money Merchant) that provided payment analytics dashboards, automatic receipt generation, and business account features generating performance benefits substantially exceeding those of basic personal mobile money accounts.

The significant but smaller performance impact of digital marketing ( $\beta = 0.348$  in regression;  $\beta = 0.324$  in SEM) reflected the higher complexity and more variable effectiveness of digital marketing investments relative to mobile money's near-universal positive impact. The wide performance distribution among digital marketing adopters — from Zone E clothing traders achieving 30–45% of monthly revenue through social media channels to Zone A produce traders with nominal social media presence generating minimal performance impact — confirmed that digital marketing effectiveness depended critically on content quality, posting consistency, platform selection, and audience engagement skills that varied substantially across the trader population. This heterogeneity implied that digital marketing support — particularly social media content creation training and platform strategy guidance — would

generate the largest performance improvements among the 61.6% of traders who had adopted social media platforms but were not yet generating significant performance returns from their digital marketing investment.

The finding that digital supply chain communication generated a significant but smaller performance improvement ( $\beta = 0.258$  in regression;  $\beta = 0.234$  in SEM) was consistent with the partial and inconsistent adoption pattern documented in the technology profile, where WhatsApp supplier groups and mobile banking supplier payments were widely adopted but more sophisticated supply chain tracking and procurement management tools remained marginal. Key informant interviews with hardware traders in Zone F-the trading zone with the highest proportional adoption of digital supply chain tools, reflecting their complex multi-supplier procurement networks revealed the most compelling accounts of supply chain communication technology impact: traders who participated in commodity WhatsApp groups with Mombasa-based port agents, Kampala bonded warehouse operators, and upcountry construction material suppliers reported 2–3 day reductions in procurement lead times and 15–20% reductions in commodity price volatility exposure-performance improvements that directly translated into higher inventory turnover ratios and improved working capital efficiency.

### **8.0 Conclusions**

This study concluded that technology adoption was a statistically powerful and practically significant driver of business operations performance among Nakasero Market traders in Kampala, Uganda, with the three technology dimensions such as mobile money and digital payment adoption, digital marketing and social media utilisation, and digital supply chain communication technology collectively explaining 67.8% of business operations performance variance. The Structural Equation Model confirmed mobile money as the non-negotiable digital foundation of trader business operations, generating the largest total performance effect ( $\beta = 0.534$ ) through both its direct transaction efficiency benefits ( $\beta = 0.398$ ) and its catalytic facilitation of digital marketing adoption (indirect effect  $\beta = 0.144$ )-a cascading adoption mechanism that amplified the return on mobile money investment well beyond its direct performance impact. Digital marketing represented the highest-growth-potential technology investment, generating strong performance improvements ( $\beta = 0.324$ ) among its adopters and presenting the largest unrealised performance opportunity for the substantial majority of traders whose digital marketing adoption was nominal or absent. Digital supply chain communication technology contributed a significant independent performance improvement ( $\beta = 0.234$ ) that, while currently limited by partial adoption, held substantial upside potential as trader digital literacy and supply chain network digitisation continued to develop.

The study further concluded that technology adoption in Nakasero Market was characterised by a complexity hierarchy from high-adoption, high-impact foundational tools (mobile money, WhatsApp communication) through moderate-adoption, high-potential tools (Facebook/Instagram marketing) to low-adoption, high-complexity tools (digital inventory management, POS systems) whose structure implied a staged technology adoption support strategy in which

foundational tool mastery was developed before more complex tool investments were promoted. The partial mediation finding confirming that mobile money adoption catalyzed digital marketing adoption, which in turn generated additional performance improvements validated this staged strategy by demonstrating that early-stage digital foundation investments generated compounding returns through their facilitation of subsequent higher-level technology adoption.

### **9.0 Recommendations**

The Uganda Communications Commission (UCC) and Nakasero Market Zone Management Committees should jointly establish a Digital Business Literacy Programme delivering structured, market-embedded training to all registered Nakasero traders in mobile money merchant services, social media business marketing, and basic digital supply chain communication tools. The programme should be delivered in Luganda through market association channels, use peer-to-peer training models leveraging high-performing digital adopters as trainer-agents, and provide follow-up mentorship for a minimum of three months post-training to support skill consolidation. Given the SEM finding that mobile money adoption catalysed digital marketing adoption, the training sequence should begin with mobile money merchant services before progressing to social media marketing.

MTN Uganda and Airtel Uganda should develop Nakasero Market-specific mobile money merchant packages that bundle automatic transaction analytics, mobile credit access, and business account features at preferential rates for registered market traders — recognising that within-adoption variation in mobile money utilisation sophistication was a primary driver of the performance differentials captured in this study, and that upgrading high-adoption traders from basic to merchant mobile money usage would generate significant additional performance returns.

Kampala Capital City Authority (KCCA) should install free public WiFi infrastructure across all seven Nakasero Market trading zones — accessible to traders and customers — as essential market infrastructure comparable to electricity, water, and sanitation, recognising digital connectivity as a foundational enabler of the mobile money and digital marketing performance improvements documented in this study. KCCA should additionally negotiate with mobile device distributors to offer affordable smartphone lease-to-own programmes specifically for Nakasero Market traders, addressing the device access barrier that limited digital marketing adoption for 18% of non-adopters.

The Private Sector Foundation Uganda (PSFU) should develop an E-Commerce Market Integration Programme connecting Nakasero Market's high-volume commodity traders with established B2B e-commerce platforms and digital supply chain management systems, providing the technical integration support and initial platform subsidies that would make advanced supply chain technology adoption commercially viable for the majority of traders for whom upfront costs and technical complexity currently represented prohibitive barriers.

### **References**

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- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W. W. Norton & Company.
- Dahnil, M. I., et al. (2014). Factors influencing SMEs adoption of social media marketing. *Procedia — Social and Behavioural Sciences*, 148, 119–126.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Hair, J. F., et al. (2019). *Multivariate Data Analysis* (8th ed.). Cengage Learning.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis. *Structural Equation Modeling*, 6(1), 1–55.
- Jack, W., & Suri, T. (2011). *Mobile money: The economics of M-PESA*. NBER Working Paper No. 16721. National Bureau of Economic Research.
- Kampala Capital City Authority. (2023). *Nakasero Market Management and Revenue Report 2022/23*. KCCA Markets Department.
- Karlan, D., et al. (2016). Getting to the top of mind: How reminders increase saving. *Management Science*, 62(12), 3393–3411.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607–610.
- Munyegera, G. K., & Matsumoto, T. (2016). Mobile money, remittances, and household welfare: Panel evidence from rural Uganda. *World Development*, 79, 127–137.
- Nkurunziza, G., et al. (2019). WhatsApp for customer retention in Kampala market trade: A digital relationship management study. *EAJBM*, 7(2).
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd ed.). McGraw-Hill.
- Ozor, N., et al. (2021). Mobile supply chain communication and trade efficiency among West African food traders. *AFJAS*, 15(4).
- Ssewanyana, D., & Kasirye, I. (2020). *Mobile money adoption and operational efficiency in Kampala market trade*. EPRC Research Series No. 148. Economic Policy Research Centre, Makerere University.
- Tapscott, D. (1996). *The Digital Economy: Promise and Peril in the Age of Networked Intelligence*. McGraw-Hill.
- Uganda Communications Commission. (2023). *Post, e-Communications and Broadcasting Market Annual Report 2022*. UCC.
- Ahumuza, A., Kobusingye, P., & Musiimenta, N. (2025). *Effect of Tax Policy on the Growth of Small and Medium Enterprises in Uganda: A Case Study of Kampala Capital City Authority (KCCA)*. 4(2), 137–146.

Akankwasa, A., Akakikunda, T., Ntirandekura, M., Murezi, C. M., & Christopher, F. (2022). *Effect of Capital Budgeting on Development of Organizations Empirical Studies of Kashinge Child Development Centre Kisoro District* . 6(9), 5–10.

Alex, I., & Julius, A. (2024). *Factors affecting the use of digital payments among Smallholder Tea Farmer in Kanungu District, Uganda*. 8(4), 23–31. [www.ijeais.org/ijapr](http://www.ijeais.org/ijapr)

Alex, I., & Kazaara, A. G. (2023). *Internal Controls and Financial Performance of Saccos in Wakiso District*. 7(3), 47–56.

Alex, I., & Moses, N. (2024). *Interest Rates and its Impact on Stock Prices among Small Scale Enterprises : An Empirical Evidence of Kampala District*. 8(4), 43–46.

Amos, S., Shamirah, B., & Richard, K. (2024). *Taxation Policies and The Development of Small Businesses . A Case Study of Namungoona Lubaga Division , Kampala*. 8(6), 92–102.

Benard, S. (2023). THE EFFECT OF PRODUCT QUALITY ON COMPETITIVENESS OF SMALL MEDIUM-SIZED ENTERPRISES (SMES) IN WESTERN UGANDA; REFLECTION ON IGARA TEA FACTORY, IN BUSHENYI DISTRICT. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE)* (Vol. 2, Issue 6).

Caroline, B., Prof, A., Milly, G., & Kemeza, I. (2026). *ICT Integration in Uganda ' s Public Universities : A Qualitative Study of Academic Staff Perceptions Through the Lens of Job Demands and Resources*. 10(3), 100–110.

Christopher, F., Moses, N., Muhindo, M. E., & Komunda, T. R. (2022). Employee Training and Organizational Performance: A Case Study of African College of Commerce and Technology in Kabale District, South Western Uganda. *International Journal of Academic Pedagogical Research*, 6(5), 1–7.

Christopher, F., Moses, N., Muhindo, M. E., Muhammad, M., & Komunda, T. R. (2022). *The Role of Information Technology in Public Administration in South Western Uganda . A Case Study of Kabale Municipality , Kabale District*. 6(5), 173–184.

Deus, T. (2023). *Inventory Control And Financial Performance Of Private Health Institutions . A Case Study Of Nakasero Hospital , Central Division*. 7(2), 158–166.

Faridah, K., Kazaara, A. G., & Kazaara, A. I. (2023). *The Effect Of Supplier Selection On Product Quality Management In Organizations . A Case Study Of Uganda Wild Life*. 7(3), 307–317.

Faridah, N., Kazaara, A. G., & Kazaara, A. I. (2023). *An Evaluation of the Effects of Advertising on Consumer Brand Awareness in an Organization , a Case Study of Mukwano Group of Companies*. 7(3), 206–212.

Irumba, A., Nicholas, K., & Alex, I. (2024). *Electronic Banking and its Impact on Financial Performance: An Empirical Evidence of Centenary Bank*. 3(4), 104–111. <https://www.researchgate.net/publication/380154046>

Isaac, O., Kazaara, A. G., & Kazaara, A. I. (2023). *Assessment of the Effect of Workplace Conflict on Employees Performance and Organizational Productivity , a Case Study of Tororo General Hospital*. 7(3), 279–289.

Julius, A., & Audrey, A. (2026). *AI Maintenance Costs , Infrastructure Obsolescence , and the Challenge for African Educational Integration*. 10(3), 97–105.

Julius, A., Audrey, A., & Kazaara, A. I. (2026). *Assessing the practicality of Activities of Integration in UNEB ' s Continuous Assessment framework*. 10(6), 232–242.

Julius, A., & Kaazara, A. G. (2025). *From Specialists to Versatilists : The Imperative for Multiple Skilling in Ugandan Higher Education*. 9(11), 380–386.

Julius, A., & Kazaara, A. G. (2025a). *Beyond the 1 . 5 Points : A Longitudinal Analysis of Gender Equity Policies in Ugandan Education and Their Perceived Societal Consequences*. 9(10), 99–104.

Julius, A., Kazaara, A. G., Munyamasoko, E. C., & Nelson, K. (2026). *Digital Marketing Practices and Sales Performance of Small and Medium Enterprises in Mbarara City , Uganda*. 10(8), 55–61.

Julius, A., & Kazaara, A. I. (2025b). *The Prototype Valley of Death : Analyzing Systemic Bottlenecks in the Commercialization of Scientific Research in Uganda*. 9(10), 173–181.

Julius, A., & Kazaara, A. I. (2026). *Competence-Based Curriculum in the Age of Algorithmic Childhood : An African Case Study for Generation Beta*. 10(3), 376–383.

Julius, A., & Nancy, M. (2026). *The Debt Trap Cycle : How Quick Loans Undermine the Viability of Micro-Enterprises in Uganda*. 10(3), 109–115.

Kaazara, A. G., & Nancy, M. (2025). *The Seventeen-Year Apprenticeship : Over-education and Under-Skilling in the African Economy . A Case Study of Uganda ' s Construction Sector*. 9(12), 294–302.

Kazaara, A. G., & Julius, A. (2025). *Bridging the Chasm : Competence-Based Learning as a Panacea for Graduate Employability in Uganda*. 9(10), 201–210.

Lutaaya, J. M., Bakashaba, E., Sendagi, M., Delivery, S., & Council, M. M. (2023). *THE RELATIONSHIP BETWEEN LOCAL REVENUE PLANNING AND SERVICE DELIVERY IN*. 4(12).

Nafiu, L. A., Oshungade, I. O., & Adewara, A. A. (2012). *Generalization of Multistage Cluster Sampling Using Finite Population*. 3(1), 17–20. [www.eaas-journal.org](http://www.eaas-journal.org)

Nagaraju, B., & Pooja, J. (2017). *Impact of Salary on Employee Performance Emperical Evidence from Public and Private Sector Banks of Karnataka*. *International Journal of Marketing and Human Resource Management.*, 8(4), 43-51.

Nancy, M., & Prudence, K. (2024). *Capacity Building programs and their impact on employee performance. A case study of Metropolitan International University*. *Researchgate.Net*, 8(4), 23–27. [https://www.researchgate.net/profile/Metropolitan-](https://www.researchgate.net/profile/Metropolitan-University/publication/380909234_Capacity_Building_programs_and_their_impact_on_employee_performan)

[University/publication/380909234\\_Capacity\\_Building\\_programs\\_and\\_their\\_impact\\_on\\_employee\\_performan](https://www.researchgate.net/profile/Metropolitan-University/publication/380909234_Capacity_Building_programs_and_their_impact_on_employee_performan)

ce\_A\_case\_study\_of\_Metropolitan\_International\_University/links/665576b30b0d2845745e0182/Capacity-Building-p

Nelson, K., Christopher, F., & Milton, N. (2022). *TEACH YOURSELF SPSS AND STATA*. 6(7), 84–122.

Nelson, K., Kazaara, A. G., & Kazaara, A. I. (2023). *Teach Yourself E-Views*. 7(3), 124–145.

Ntirandekura, M., Friday, C., & Muhammad, M. (2022). Rewards and Staff Retention in Public Sector in Uganda: An Empirical Study from Kabale District Local Government. *International Journal of Academic Management Science Research*, 6(7), 165–170.

Paul, W., & Kazaara, A. G. (2023). *Assessing How Employee Job Rotation Affects Workers Productivity In Organizations . A Case Study of Action against Hunger , Kiryandongo District .* 7(3), 168–173.

Polycarp, K., Kazaara, A. G., Kazaara, A. I., Prudence, K., & Nicholas, K. (2023). *The effect of loan defaults on profitability of financial institutions in Uganda : a case study of post bank , Anaka branch , Nwoya district.* 7(3), 172–178.

Ramadhan, B., Alex, I., Kazaara, A. G., Nelson, K., Deus, T., & Pascal, T. (2023). *Taxation and the Development of Small Businesses in Uganda , a Case Study of Iganga District.* 7(2), 136–149.

Rodrigues Pinho, J. C. M., & Soares, A. M. (2011). Examining the technology acceptance model in the adoption of social networks. *Journal of Research in Interactive Marketing*. <https://doi.org/10.1108/17505931111187767>

Sarah, A., & Audrey, A. (2024). *Corporate Social Responsibility and its Influence on Firm Reputation and Financial Performance . A Case Study of Equity.* 8(8), 202–207.

Seo, K., Tang, J., Roll, I., Fels, S., & Yoon, D. (2021). The impact of artificial intelligence on learner – instructor interaction in online learning. *International Journal of Educational Technology in Higher Education*. <https://doi.org/10.1186/s41239-021-00292-9>

Sophie, N., & Crispus, F. (2024). *Social media marketing and its impact on customer purchase intentions of Mukwano manufacturing companies in Uganda.* 8(4), 92–95.

The, A., Of, I., Revenue, L., City, M. K., Shallon, K., & Henry, M. (2024). *Metropolitan Journal Of Business & Economics ISSN : 1813-4238 Corresponding : Author : research@miu.ac.ug / publications Metropolitan Journal Of Business & Economics ISSN : 1813-4238 Vol . 3 Issue 6 , June- 2024 , Pages : 273-286 Corresponding : Author : . 3(6), 273–286.*

Winny, N. D., Ariyo, D., Kazaara, G., Kazaara, A. I., & Deus, T. (2023). Effect Of Motivation On Employee Performance In Non-Government Organizations (NGOS): A Case Of Mbale City. In *International Journal of Academic Multidisciplinary Research* (Vol. 7). [www.ijeais.org/ijamr](http://www.ijeais.org/ijamr)

Uganda Revenue Authority. (2023). Digital Tax Compliance Progress Report: Kampala Markets 2022/23. URA.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180.

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