E-business literacy among small and medium enterprises in Tanzania: An empirical assessment of owners' capability to adopt and run online platforms

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ABSTRACT

Small and medium enterprises (SMEs) are the backbone of Tanzania's economy, yet many struggle to sell online. A key but under-examined barrier is e-business literacy: the knowledge and skills owners need to adopt and run online platforms, spanning the technical, marketing, payment, logistics, data-security, financial, legal and customer-management aspects of e-business. This study assessed the level and determinants of SME e-business literacy in Tanzania and its effect on the capability to adopt and run online platforms, and proposed a preliminary capability framework. A cross-sectional quantitative survey design was combined with design science research to derive the framework. Survey data were analyzed from 550 SME owners and managers across retail, fashion, food, agriculture, services and other sectors. The instrument showed high internal consistency (overall Cronbach's alpha = 0.865); sampling adequacy was met (Kaiser-Meyer-Olkin = 0.833; Bartlett's test, $p < 0.001$); and exploratory factor analysis returned 11 factors explaining 69.3% of the variance. Multiple linear regression explained 17.0% of the variance in adoption capability (adjusted R-squared = 0.154; $F = 11.03$, $p < 0.001$), with training access, financial records literacy, logistics literacy and legal-regulatory literacy the significant predictors. Legal-regulatory literacy and training access recorded the lowest scores, marking the biggest literacy gaps. The study contributes a validated measurement instrument, empirical evidence on the determinants of SME adoption capability, and a capability framework. It recommends that trainers and business-support bodies deliver targeted, hands-on training in the weakest and most decisive literacies, namely legal-regulatory compliance, logistics and financial record-keeping, rather than generic digital courses; that platform and payment providers simplify onboarding and provide guided support; and that government and regulators widen access to training and issue clear guidance on e-commerce rules and data protection.

Keywords: Digital Literacy, E-Business Literacy, E-Commerce Adoption, E-Readiness, SMEs, Tanzania

I. INTRODUCTION

The global economy has become increasingly digital, and electronic commerce is now a central channel through which enterprises reach markets, transact and grow. In developing and emerging economies in particular, the rapid spread of mobile connectivity and digital payments has opened online trade to firms that were previously excluded from formal commerce (UNCTAD, 2021). For micro, small and medium enterprises (MSMEs), which form the majority of businesses worldwide, the ability to sell through online platforms has become a decisive factor in competitiveness, market reach and resilience. This shift has made the digital capabilities of small firms, rather than their access to technology alone, a matter of growing policy and research interest.

Tanzania reflects this global pattern. Small and medium enterprises account for a substantial share of national employment and output and are widely regarded as an engine of income generation and poverty reduction (United Republic of Tanzania, 2003). At the same time, the country has experienced strong growth in mobile telephony, mobile money and social-media use, which together provide an accessible infrastructure for online selling (GSM Association [GSMA], 2024). Tanzanian SMEs span retail, fashion and tailoring, food, beauty, agriculture, handicrafts, professional services and tourism, and many already transact informally through social media and mobile money. In principle, these enterprises are therefore well placed to move from informal social selling into structured online platforms.

In practice, however, a large share of Tanzanian SMEs remain offline or use online platforms only superficially, posting occasionally on social media without managing listings, payments, delivery, records or customer relationships in a sustained way. This gap between access and effective use points to a barrier that lies less in technology or connectivity than in capability. The central concern of this study is e-business literacy: the practical knowledge and skills that owners and managers need to adopt an online platform and run it effectively, encompassing platform and technical skills, digital marketing, digital payments, logistics, data protection and security, financial record-keeping, customer management, and awareness of the relevant legal and regulatory obligations.

Framing the problem as one of literacy connects it to a wider body of evidence showing that the knowledge and skills of individuals, not merely their access to tools, determine who benefits from technology. This is well established for financial decision-making, where financial literacy is unevenly distributed and predicts better outcomes (Lusardi &

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Mitchell, 2014), and, increasingly, for digital and internet use, where skills are unevenly distributed and track education and experience (van Deursen & van Dijk, 2011). For SMEs, the relevant literacy is specifically the ability to run an online business, yet this dimension is rarely defined or measured directly, especially in East Africa. Operating online in Tanzania also carries legal responsibilities, notably under the Electronic and Postal Communications Act, 2010 (United Republic of Tanzania, 2010) and the Personal Data Protection Act, 2022 (United Republic of Tanzania, 2022). These obligations directly inform the present study: they are why legal and regulatory awareness is measured as one of its e-business literacy constructs, and why its own data collection was designed to comply with the Personal Data Protection Act, 2022, as detailed in Section 3.7.

This study is organised around a set of key variables that together describe SME online capability. The predictor variables are the eight dimensions of e-business literacy: platform and technical literacy, the ability to set up and operate an online store; digital marketing literacy, the ability to attract customers online; e-payment literacy, the ability to receive and reconcile digital payments; logistics literacy, the ability to arrange fulfilment and delivery; data and security literacy, the ability to protect business and customer data and resist fraud; financial and records literacy, the ability to price and keep digital records; customer-management literacy, the ability to handle enquiries, reviews and complaints; and legal and regulatory literacy, awareness of the rules governing online trade. Two enabling variables, training access and self-efficacy, condition how readily these literacies are acquired. The dependent variable is adoption capability: the enterprise's readiness and ability to adopt and run an online platform. Examining these variables together allows the study to establish not only how literate SMEs are, but which specific literacies most strongly shape their capability to trade online.

This study responds to that gap by defining SME e-business literacy as a multi-dimensional construct, measuring it empirically among Tanzanian SME owners and managers, and testing which of its dimensions, together with enabling factors, most strongly shape the capability to adopt and run online platforms. The significance of the study is threefold. Theoretically, it extends technology-adoption and literacy research by conceptualising and operationalising e-business literacy as a distinct, measurable capability. Practically, it identifies the specific literacies that most constrain SMEs, providing an evidence base for targeted training and support. For policy, it offers guidance to government agencies, business-support institutions and training providers seeking to raise SME participation in the digital economy. The remainder of the paper reviews the relevant literature, sets out the methodology, presents and discusses the results, proposes a capability framework, and concludes with recommendations.

1.1 Statement of the Problem

Although e-commerce adoption and digital literacy are each well studied, few studies define and measure SME e-business literacy as a multi-dimensional construct, or link it empirically to adoption capability, in the East African context, where mobile money provides a payment rail (GSMA, 2024) but delivery, trust and skills remain constraints (Pallangyo, 2022). Where these skills are thin, SMEs adopt online platforms slowly or run them poorly. The problem this study addresses is to measure SME e-business literacy and identify which parts most affect the capability to adopt and run online platforms.

1.2 Research Objectives

i. To derive and measure the dimensions of SME e-business literacy and the enabling factors relevant to adopting online platforms;
ii. To determine which of these most influence SMEs' capability to adopt and run online platforms; and
iii. To develop a capability framework that translates the findings into targeted support for SMEs and their ecosystem.

1.3 Research Hypotheses

Drawing on e-commerce-adoption and literacy research (Molla & Licker, 2005; Grandon & Pearson, 2004; Davis, 1989), the study tested ten directional hypotheses, each predicting that the named construct positively influences SMEs' adoption capability, at alpha = 0.05:

H1: Platform and technical literacy positively influences adoption capability.
H2: Digital marketing literacy positively influences adoption capability.
H3: E-payment literacy positively influences adoption capability.
H4: Logistics literacy positively influences adoption capability.
H5: Data and security literacy positively influences adoption capability.
H6: Financial and records literacy positively influences adoption capability.
H7: Customer-management literacy positively influences adoption capability.
H8: Legal and regulatory literacy positively influences adoption capability.
H9: Training access positively influences adoption capability.
H10: Self-efficacy positively influences adoption capability.

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II. LITERATURE REVIEW

2.1 Theoretical Framework

The study is underpinned by a set of complementary theories that explain technology adoption at two levels of analysis: the individual adopter and the organisation within its environment.

2.1.1 Technology Acceptance and Diffusion Models

Several complementary theories explain technology adoption, each operating at a different level of analysis. At the individual level, the Technology Acceptance Model (TAM) holds that perceived usefulness and perceived ease of use drive acceptance (Davis, 1989), a logic later broadened by the Unified Theory of Acceptance and Use of Technology, which adds performance and effort expectancy, social influence and facilitating conditions (Venkatesh et al., 2003). These models explain intention well, but they treat the technology as a given and say little about whether a user actually possesses the skills to operate it, an assumption that is problematic for small firms whose owners may intend to sell online yet lack the practical competence to do so. Diffusion of Innovations similarly emphasises innovation attributes such as relative advantage and complexity (Rogers, 2003) without directly modelling user capability.

2.1.2 Technology-Organization-Environment Framework and Perceived E-Readiness

At the organisational and environmental level, the Technology-Organization-Environment (TOE) framework locates adoption in technological, organisational and environmental conditions (Tornatzky & Fleischer, 1990), and, applied to developing countries, the perceived e-readiness model shows that both firm-internal and external e-readiness shape e-commerce adoption (Molla & Licker, 2005), while Grandon and Pearson find that perceived strategic value and organisational readiness drive adoption among small and medium businesses (Grandon & Pearson, 2004). Read together, these strands converge on a common theme: adoption depends not only on the technology or on intention but on the readiness and capability of the adopter. What the adoption literature underspecifies, however, is the concrete knowledge and skills that constitute owner capability. The present study addresses this by drawing on literacy theory, which treats capability as a measurable, multi-dimensional set of skills, and applies it to the online-business context. The study is therefore grounded principally in the TOE and e-readiness perspectives, extended with a literacy lens.

2.2 Empirical Review

2.2.1 Dimensions of SME E-Business Literacy

The first strand of literature concerns what it means to be literate in handling money and technology, and provides the foundation for conceptualising e-business literacy. Lusardi and Mitchell (2014) synthesised a large body of survey-based evidence on financial literacy across many countries, using standardised knowledge instruments, and found that financial literacy is generally low, is unevenly distributed by education, gender and income, and reliably predicts saving, borrowing and planning outcomes. Their central message, that knowledge rather than access shapes financial behaviour, is the premise on which the present study rests. Their work is nonetheless confined to personal finance and does not address the operational competences required to run a business online, which is the gap this study fills.

As economies digitalised, this literacy has been argued to extend into digital financial literacy. Morgan, Huang and Trinh (2019), in a conceptual and policy analysis for the Asian Development Bank Institute drawing on cross-country evidence, defined digital financial literacy as the combination of financial and digital competence and identified its components as knowledge of digital financial products, awareness of associated risks, the know-how to protect oneself, and awareness of consumer rights. Their study supports treating competence in digital commerce as a distinct and teachable literacy rather than an extension of access. However, their focus is the individual consumer of financial services, not the small firm that must market, sell, fulfil and account for goods online, leaving the enterprise-level literacies unspecified.

A parallel digital-divide literature examines skills directly. Van Deursen and van Dijk (2011) measured the actual internet skills of a sample of users through performance tests, distinguishing operational, formal, information and strategic skills, and found that people manage operational and formal tasks reasonably well but struggle with the higher-order information and strategic skills, with attainment tracking education. Applied to SMEs, this implies that a firm may operate a platform mechanically yet lack the judgement-intensive competences, such as interpreting data, ensuring compliance and planning, that effective online trading demands, and that closing access gaps does not close usage gaps. This evidence is drawn from a high-income, general-population setting rather than African SMEs, and it measures generic rather than business-specific skills, which the present study addresses by measuring the specific literacies of online trading among Tanzanian SMEs.

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2.2.2 Determinants of Adoption Capability

A second strand of empirical work studies why small firms take up e-commerce. Molla and Licker (2005) surveyed SMEs in a developing country using a perceived e-readiness instrument covering both firm-internal factors (awareness, human resources, business resources) and external factors (government, market forces, support infrastructure), and found that both dimensions significantly predicted e-commerce adoption, with internal readiness the stronger driver. Grandon and Pearson (2004) surveyed small and medium U.S. businesses and found that perceived strategic value, organisational readiness and, to a lesser extent, external pressure predicted e-commerce adoption, extending the e-readiness logic with a strategic-value dimension. Both studies converge on organisational readiness as decisive, which supports the present study's focus on owner and firm capability. However, both measure readiness and intention at a general level and were conducted in a developed-economy (Grandon & Pearson) or single-country Middle Eastern (Molla & Licker) context; neither itemises the specific operational skills, such as digital marketing, logistics or record-keeping, that determine whether a ready firm can actually run an online platform, which is the gap the present study's construct-level measurement addresses.

Regional evidence adds context but remains fragmented. GSMA (2024) reported industry data showing mobile money has become a widely used payment rail across East Africa, providing SMEs with an accessible transaction channel, but its industry-report method describes usage volumes rather than firm-level capability, so it cannot speak to whether SMEs can use that payment rail effectively alongside marketing, logistics and record-keeping. Pallangyo (2022) analysed mobile-money fraud and cybersecurity incidents in Tanzania and found that weak user and business cybersecurity awareness was a persistent vulnerability, aligning with this study's inclusion of a data-and-security-literacy construct, but the study's law-enforcement and cybercrime focus does not extend to the wider set of e-business competences, such as marketing or customer management, that this study also measures. Taken together, the regional evidence establishes that a payment infrastructure exists while security and skills remain weak, but no study integrates payments, security, logistics, marketing and records into one measured account of SME online capability.

2.2.3 Building SME E-Business Capability

A third strand of work considers how digital capability can be built once its gaps are known. Morgan et al. (2019) and van Deursen and van Dijk (2011), reviewed above, both conclude from their respective policy-analysis and skills-testing methods that generic access or one-off exposure does not raise capability; instead, targeted, hands-on and context-appropriate training is needed to convert knowledge into effective use. This motivates the present study's aim of identifying which specific literacies most need such targeted training, rather than recommending training in general. Separately, Hevner, March, Park and Ram (2004) and Peffers, Tuunanen, Rothenberger and Chatterjee (2007) developed design science research as a methodology for building and evaluating practical artefacts, such as frameworks and tools, from research evidence, through iterative design and evaluation cycles; this study adopts their methodology to translate its empirical findings into a capability framework. None of these studies, however, grounds a training or capability framework in direct, construct-level measurement of SME e-business literacy, and none is set in an East African SME context, leaving capability-building efforts without an evidence base tailored to the literacies that matter most in this setting, which the present study supplies.

2.3 Research Gap

Taken as a whole, the literature establishes that adopter capability determines effective technology use, and that skills are multi-dimensional and unevenly distributed. What is missing is an integrated, empirically validated conceptualisation of SME e-business literacy that (i) defines it as a multi-dimensional construct spanning the practical competences of online trading, (ii) measures it directly among SME owners and managers, and (iii) links it to the capability to adopt and run online platforms, particularly in the under-researched East African context. Prior studies address adoption intention, financial or digital literacy, or single capabilities in isolation, but none combines these into a measured, dimension-level model of SME online capability. The present study addresses this gap.

2.4 Conceptual Framework

Building on the theoretical and empirical review, the study conceptualises eleven constructs. Eight are dimensions of e-business literacy itself, each derived from a documented requirement of online trading: platform and technical, digital marketing, e-payment, logistics, data and security, financial and records, customer-management, and legal and regulatory literacy. Two are enabling factors drawn from the literacy and self-efficacy literature: training access and self-efficacy. The outcome construct, adoption capability, is the firm's capability to adopt and run online platforms. The study hypothesises that each of the ten predictor constructs positively influences adoption capability. Each construct is defined operationally in the questionnaire, with a representative item shown in Appendix A. The hypothesised relationships among the variables are illustrated in Figure 1.

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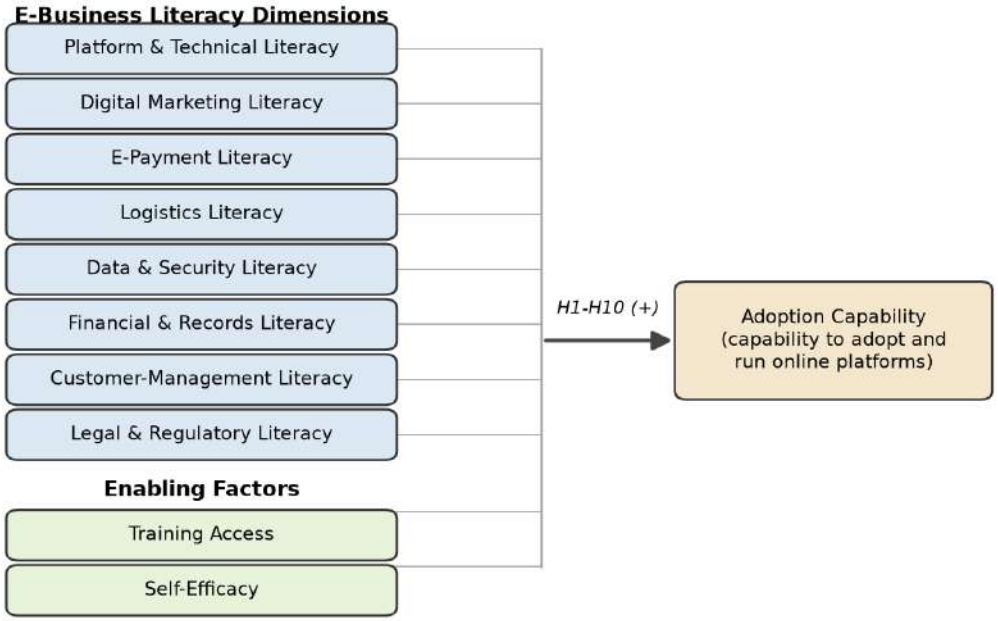


Figure 1
Conceptual Framework Linking E-Business Literacy Dimensions and Enabling Factors to Adoption Capability

III. METHODOLOGY

3.1 Research Design

The study adopted a cross-sectional, quantitative survey design with a deductive approach, complemented by a design science strand that produced the preliminary capability framework (Creswell & Creswell, 2018; Saunders et al., 2019; Hevner et al., 2004; Peffers et al., 2007). A cross-sectional quantitative design was appropriate because the study sought to measure defined constructs across a large number of enterprises at one point in time and to test hypothesised relationships between the dimensions of e-business literacy and adoption capability, which calls for standardised measurement and statistical analysis rather than in-depth case study. No qualitative interview data were collected or analysed; the study is therefore quantitative, and the design science strand is limited to translating the empirical findings into the proposed framework.

3.2 Study Area

The study was conducted in Tanzania, focusing on the urban and peri-urban commercial centres where SME online-selling activity is concentrated and where access to mobile money, connectivity and courier services makes online trading feasible. Data were collected across seven of the country's principal commercial regions, namely Dar es Salaam, Arusha, Dodoma, Mwanza, Mbeya, Kilimanjaro and Zanzibar, which together span the coastal, northern, central, lake and southern-highlands zones. These areas were selected because they contain a high density and diversity of SMEs across the sectors of interest, and because their enterprises are the most likely to have begun the transition from informal social selling toward structured online platforms, making them information-rich for the study's objectives.

3.3 Target Population

The target population comprised owners and managers of small and medium enterprises operating in the study area across retail, fashion and tailoring, electronics, food, beauty, agriculture, handicrafts, professional services and tourism. Owners and managers were chosen as the unit of analysis because they make the decisions about adopting and running online platforms and are best placed to report on the enterprise's literacy and capability.

3.4 Sampling and Sample Size

The minimum sample size was determined using the Yamane formula (Yamane, 1967), a widely used alternative to the Krejcie and Morgan table (Krejcie & Morgan, 1970), at a 95% confidence level (e = 0.05). Assuming a working population parameter of about 1,200 enterprises for estimation:

$$n = N / (1 + N \times e^2) = 1200 / (1 + 1200 \times 0.05^2) = 300 \quad \ldots\ldots (1)$$

The estimated minimum was about 300 respondents; to strengthen the reliability and factorial stability of the analysis, data collection continued until 550 valid responses were obtained, exceeding the minimum and improving statistical power. A stratified sampling approach was used to ensure representation across the seven study regions,

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business sectors and firm sizes, and within strata respondents were reached through convenience sampling given the absence of a complete sampling frame of online-active SMEs; the reliance on convenience sampling within strata is acknowledged as a limitation.

3.5 Data Collection Instruments and Procedures

Data were collected using a structured, self-administered questionnaire measuring eleven constructs with 43 five-point Likert items (1 = strongly disagree to 5 = strongly agree): platform and technical literacy, digital marketing literacy, e-payment literacy, logistics literacy, data and security literacy, financial and records literacy, customer-management literacy, legal and regulatory literacy, training access, self-efficacy, and the dependent construct, adoption capability. The instrument opened with a background section and an informed-consent statement, followed by the construct items. Items were derived from the e-commerce-adoption and literacy literature reviewed above and worded in plain language suitable for SME owners; a representative item for each construct is shown in Table 8 below.

All items use a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Each construct was measured with three to four items; a representative item is shown.

Table 1

Constructs and Representative Items

Construct	Representative item
Platform and technical literacy	I know how to set up and manage products on an online-selling platform
Digital marketing literacy	I know how to market my business online using social media
E-payment literacy	I understand how to receive and reconcile digital payments
Logistics literacy	I know how to arrange reliable delivery of orders to customers
Data and security literacy	I understand how to protect my business and customer data
Financial and records literacy	I can keep digital records and use sales data to decide
Customer-management literacy	I know how to handle customers, reviews and complaints online
Legal and regulatory literacy	I understand the rules and consumer-protection requirements for selling online
Training access	I have access to training and support to help me sell online
Self-efficacy	I am confident I can run my business on an online platform
Adoption capability	My business is able and ready to adopt and run an e-business platform

Data were collected using a mixed-mode approach that combined online and offline administration. The questionnaire was distributed online as a web-based form shared with SME owners and managers through digital channels, and offline as a printed hardcopy completed in person by business owners and sellers in local markets across the seven study regions. Using both modes widened reach and accommodated respondents with differing levels of internet access, while keeping the instrument identical across modes. Participation was voluntary and responses were anonymous. The completed online and hardcopy responses were compiled into a single dataset, giving a total of 550 valid responses for analysis.

Content validity was established by mapping items to constructs grounded in the e-commerce-adoption and literacy literature; construct validity was assessed by exploratory factor analysis and internal consistency by Cronbach's alpha (Cronbach, 1951; Field, 2018), against the conventional 0.70 threshold (Nunnally & Bernstein, 1994). As the results show, the overall scale was strongly consistent (alpha = 0.865), with per-construct alphas from 0.782 to 0.861, all above the threshold.

3.6 Data Analysis

Quantitative data were analysed with descriptive statistics, reliability analysis, exploratory factor analysis, using the Kaiser-Meyer-Olkin measure (Kaiser, 1974) and Bartlett's test (Bartlett, 1950); Pearson correlation; and multiple linear regression, with tests at alpha = 0.05 and confidence intervals and effect sizes reported (Field, 2018; Hair et al., 2019; Tabachnick & Fidell, 2019). The analysis is fully scripted and reproducible.

3.7 Ethical Considerations

The study observed informed consent, voluntary participation, anonymity, confidentiality and compliance with the Personal Data Protection Act, 2022 (United Republic of Tanzania, 2022). Data were collected between December 2025 and May 2026 from consenting SME owners and managers; the survey was anonymous and collected no business names, and all responses were aggregated for analysis. The study was conducted as part of the author's institutional research at the College of Business Education, and consent was obtained through the questionnaire's consent statement.

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IV. FINDINGS & DISCUSSION

4.1 Respondent Profile

The sample comprised 550 SME owners and managers, drawn across ten business sectors and the seven study regions. Table 1 reports the sectoral distribution in detail: retail and shop businesses were the largest group (n = 110, 20.0%), followed by food and restaurant businesses (n = 63, 11.5%), beauty and cosmetics (n = 60, 10.9%), electronics and phone accessories (n = 57, 10.4%), fashion and tailoring (n = 54, 9.8%), professional services (n = 53, 9.6%), tourism and hospitality (n = 43, 7.8%), agriculture and agro-processing (n = 42, 7.6%), other small businesses (n = 35, 6.4%), and handicrafts and art (n = 33, 6.0%). This distribution shows the sample spanned both trading (retail, electronics) and service-oriented (professional services, tourism) enterprises, with no single sector dominating. Respondents had, on average, 5.04 years in business (SD = 3.19), indicating an established, rather than newly formed, set of enterprises.

Table 2

Respondent Distribution by Business Sector (n = 550)

Business sector	n	%
Retail / Shop	110	20.0%
Food & Restaurant	63	11.5%
Beauty & Cosmetics	60	10.9%
Electronics & Phone Accessories	57	10.4%
Fashion & Tailoring	54	9.8%
Professional Services	53	9.6%
Tourism & Hospitality	43	7.8%
Agriculture & Agro-processing	42	7.6%
Other small business	35	6.4%
Handicrafts & Art	33	6.0%

4.1.1 Level and Dimensions of SME E-Business Literacy

Table 2 reports the mean, standard deviation and range for each of the eleven constructs, measured on a 1-to-5 scale. Legal-regulatory literacy recorded the lowest mean (M = 2.63, SD = 0.54), tied with training access (M = 2.63, SD = 0.52), indicating that, on average, respondents disagreed or were neutral about their compliance awareness and access to support. Logistics literacy (M = 2.82, SD = 0.53) and financial and records literacy (M = 3.02, SD = 0.59) were the next lowest, both below the overall midpoint region. By contrast, e-payment literacy recorded the highest mean (M = 3.47, SD = 0.53), followed by customer-management literacy (M = 3.42, SD = 0.56), platform and technical literacy (M = 3.28, SD = 0.57) and self-efficacy (M = 3.29, SD = 0.54). Digital marketing literacy (M = 3.10, SD = 0.60) and data and security literacy (M = 3.12, SD = 0.56) fell in between. Adoption capability itself, the outcome construct, averaged M = 3.08 (SD = 0.54). This pattern shows that respondents felt most capable in transacting (e-payments) and serving customers, but least capable in the compliance, logistics and financial record-keeping literacies, and had only limited access to training.

Table 3

Descriptive Statistics for the Eleven Constructs (1 to 5 Scale)

Construct	Mean	SD	Min	Max
Platform Technical Literacy	3.28	0.57	1.75	5.00
Digital Marketing Literacy	3.10	0.60	1.75	4.75
E Payment Literacy	3.47	0.53	1.75	5.00
Logistics Literacy	2.82	0.53	1.50	4.75
Data Security Literacy	3.12	0.56	1.50	4.75
Financial Records Literacy	3.02	0.59	1.25	4.75
Customer Management Literacy	3.42	0.56	2.00	5.00
Legal Regulatory Literacy	2.63	0.54	1.33	4.33
Training Access	2.63	0.52	1.00	4.75
Self-Efficacy	3.29	0.54	1.50	5.00
Adoption Capability	3.08	0.54	1.00	4.75

The overall 43-item scale was highly reliable (Cronbach's alpha = 0.865). Table 3 reports the per-construct values, ranging from 0.782 (legal-regulatory literacy, 3 items) to 0.861 (digital marketing literacy, 4 items), all at or above the conventional 0.70 threshold (Cronbach, 1951; Nunnally & Bernstein, 1994), confirming that each construct was measured consistently.

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Table 4

Reliability of the Construct Scales

Construct	Items	Cronbach's alpha
Platform Technical Literacy	4	0.859
Digital Marketing Literacy	4	0.861
E Payment Literacy	4	0.833
Logistics Literacy	4	0.835
Data Security Literacy	4	0.852
Financial Records Literacy	4	0.855
Customer Management Literacy	4	0.848
Legal Regulatory Literacy	3	0.782
Training Access	4	0.832
Self-Efficacy	4	0.841
Adoption Capability	4	0.846

The data were well suited to factoring (Kaiser-Meyer-Olkin measure of sampling adequacy = 0.833; Bartlett's test of sphericity, chi-square = 10359.57, df = 903, $p < 0.001$). Exploratory factor analysis using the Kaiser criterion returned 11 factors explaining 69.3% of the total variance, matching the eleven intended constructs and supporting the construct validity of the instrument (Kaiser, 1974; Hair et al., 2019).

4.1.2 Determinants of Adoption Capability

Table 4 reports the Pearson correlation of each of the ten predictor constructs with adoption capability. All ten correlations were positive and statistically significant ($p < 0.01$). Training access showed the strongest association ($r = 0.261$), followed by financial and records literacy ($r = 0.255$), digital marketing literacy ($r = 0.190$), legal-regulatory literacy ($r = 0.188$), platform and technical literacy ($r = 0.183$), logistics literacy ($r = 0.164$), self-efficacy ($r = 0.142$), customer-management literacy ($r = 0.136$), data and security literacy ($r = 0.062$), and e-payment literacy, the weakest association ($r = 0.060$). All coefficients indicate small-to-moderate associations by conventional benchmarks, meaning each literacy dimension is related to, but far from wholly determinative of, adoption capability on its own.

Table 5

Pearson Correlation of Each Construct with Adoption Capability

Construct	r
Training Access	0.261
Financial Records Literacy	0.255
Digital Marketing Literacy	0.190
Legal Regulatory Literacy	0.188
Platform Technical Literacy	0.183
Logistics Literacy	0.164
Self-Efficacy	0.142
Customer Management Literacy	0.136
Data Security Literacy	0.062
E Payment Literacy	0.060

A multiple linear regression was fitted with adoption capability as the dependent variable and the ten literacy and enabling constructs, entered as standardized predictors, as independent variables, following the general form $Y = b0 + b1X1 + b2X2 + ... + b10X10 + e$, where Y is adoption capability, b0 is the constant, b1 to b10 are the standardized coefficients for each predictor, and e is the error term. The model was statistically significant and explained 17.0% of the variance in adoption capability (R-squared = 0.170, adjusted R-squared = 0.154; $F(10, 539) = 11.03$, $p < 0.001$; Cohen's f-squared = 0.205, a medium effect size). Table 5 reports the full set of standardized coefficients. Four predictors were statistically significant: training access, H9 (beta = 0.184, $t = 4.44$, $p < 0.001$, 95% CI [0.10, 0.27]), financial and records literacy, H6 (beta = 0.178, $t = 4.14$, $p < 0.001$, 95% CI [0.09, 0.26]), logistics literacy, H4 (beta = 0.133, $t = 3.26$, $p = 0.001$, 95% CI [0.05, 0.21]), and legal-regulatory literacy, H8 (beta = 0.129, $t = 3.15$, $p = 0.002$, 95% CI [0.05, 0.21]). The remaining six predictors were not statistically significant in the multivariate model: digital marketing literacy, H2 (beta = 0.067, $t = 1.57$, $p = 0.116$), customer-management literacy, H7 (beta = 0.055, $t = 1.30$, $p = 0.195$), self-efficacy, H10 (beta = 0.047, $t = 1.13$, $p = 0.257$), platform and technical literacy, H1 (beta = 0.040, $t = 0.94$, $p = 0.349$), e-payment literacy, H3 (beta = -0.007, $t = -0.18$, $p = 0.858$), and data and security literacy, H5 (beta = -0.055, $t = -1.30$, $p = 0.193$). Hypotheses H4, H6, H8 and H9 were therefore supported; H1, H2, H3, H5, H7 and H10 were not supported.

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Table 6

Multiple Linear Regression Predicting Adoption Capability (Standardized)

Predictor	Beta	t	p	95% CI	Hypothesis
Training Access	0.184	4.44	< .001	[0.10, 0.27]	Supported
Financial Records Literacy	0.178	4.14	< .001	[0.09, 0.26]	Supported
Logistics Literacy	0.133	3.26	0.001	[0.05, 0.21]	Supported
Legal Regulatory Literacy	0.129	3.15	0.002	[0.05, 0.21]	Supported
Digital Marketing Literacy	0.067	1.57	0.116	[-0.02, 0.15]	Not supported
Customer Management Literacy	0.055	1.30	0.195	[-0.03, 0.14]	Not supported
Self-Efficacy	0.047	1.13	0.257	[-0.03, 0.13]	Not supported
Platform Technical Literacy	0.040	0.94	0.349	[-0.04, 0.12]	Not supported
E Payment Literacy	-0.007	-0.18	0.858	[-0.09, 0.07]	Not supported
Data Security Literacy	-0.055	-1.30	0.193	[-0.14, 0.03]	Not supported

Comparing the correlation and regression results shows a clear narrowing: although all ten constructs correlated positively and significantly with adoption capability on their own (Table 4), only four retained independent significance once all ten were considered together (Table 5). This narrowing is not attributable to multicollinearity: variance inflation factors for the ten predictors ranged from 1.09 to 1.21, well below the conventional threshold of 5 (Hair et al., 2019; Tabachnick & Fidell, 2019), so the four non-significant predictors are genuinely weak once the others are held constant, rather than statistically suppressed by overlapping predictors. Notably, three of the four significant predictors, training access, financial and records literacy, and legal-regulatory literacy, are also among the constructs with the lowest mean scores in Table 2, meaning the literacies that matter most for adoption capability are also the ones SME owners currently possess least.

4.1.3 A Proposed E-Business Literacy Capability Framework

Guided by the pattern of significant determinants reported in Section 4.3 and by the design science methodology (Hevner et al., 2004; Peffers et al., 2007), a capability framework was developed setting out the e-business literacy capabilities SMEs need to adopt and run online platforms, and practical means of building them. Table 6 lists the framework's components, each one mapped directly to a construct measured in the survey, its function, and the specific capability gap identified in Section 4.2 or 4.3 that it addresses; the framework is not itself separately validated beyond the empirical analysis that produced it, and is offered as a starting point for practical application and future testing.

Table 7

E-Business Literacy Capability Framework Components

Component	Function	Builds
Platform and technical skills	Setting up, listing and managing an online store	Platform literacy
Digital-marketing skills	Attracting and reaching customers online	Marketing literacy
Digital-payment skills	Taking and reconciling mobile money and card payments	Payment literacy
Logistics and fulfilment skills	Arranging reliable delivery and returns	Logistics literacy
Data-protection and security skills	Keeping business and customer data safe and lawful	Security literacy
Financial and records skills	Digital records, pricing and data-driven decisions	Financial literacy
Customer-management skills	Handling enquiries, reviews and complaints online	Customer literacy
Legal and regulatory awareness	Understanding online-selling rules and consumer rights	Legal literacy
Training and support access	Accessible, local-language training and mentoring	Enabling access
Self-efficacy building	Confidence to learn and run an online business	Self-efficacy
Adoption support	Hand-holding to launch and sustain a platform	Adoption capability

4.2 Discussion

Bringing the findings together, the level, determinant and framework results are discussed here against the theoretical and empirical literature reviewed in Section II. The overall level of SME e-business literacy found in Section 4.2, moderate on transactional and customer-facing literacies but weak on legal-regulatory awareness, logistics and financial record-keeping, extends the digital-divide finding that people manage operational tasks but struggle with higher-order, judgement-intensive skills (van Deursen & van Dijk, 2011): Tanzanian SME owners in this sample show the same pattern, managing the mechanics of receiving payment and serving customers while lagging on the compliance and planning literacies that require more than routine use. It also confirms, in an enterprise setting, the broader finding that knowledge is unevenly distributed and does not automatically follow from access to a payment rail (Lusardi &

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Mitchell, 2014; GSMA, 2024): mobile money and mobile connectivity are widespread in Tanzania, yet this did not translate into strong legal, logistics or financial literacy among the SMEs surveyed.

The determinants identified in Section 4.3, that training access, financial and records literacy, logistics literacy and legal-regulatory literacy independently predict adoption capability while digital marketing, customer management, self-efficacy, platform skills, e-payment and data-security literacy do not, both support and refine the e-readiness literature. It supports Molla and Licker (2005) and Grandon and Pearson (2004) in confirming that firm-level readiness factors, not merely access or technical exposure, drive e-commerce capability; the significance of training access as the strongest predictor echoes their emphasis on organisational readiness. It refines their work, however, by showing which specific literacies matter once measured individually: platform and technical literacy and e-payment literacy, despite being necessary to operate online at all, were not significant independent predictors of capability in this sample, suggesting that once SMEs have reached a baseline of technical and payment competence, it is the higher-order, compliance- and resource-management-oriented literacies that differentiate more capable firms from less capable ones. This is a more granular finding than the general readiness constructs used in prior e-readiness research, and it is only possible because the present study measured e-business literacy as eight separate dimensions rather than a single readiness score.

The finding that legal-regulatory literacy is both a significant predictor and the lowest-scoring construct is consistent with, and extends, Pallangyo (2022) finding that cybersecurity and regulatory awareness are weak among Tanzanian mobile-money users: the present study shows this weakness also holds for SMEs' broader legal awareness of e-commerce and data-protection obligations, and that it measurably constrains their capability to trade online, not merely their exposure to fraud. Likewise, the weakness of financial and records literacy, despite it being a significant predictor, extends Morgan et al.'s (2019) argument that digital financial literacy is a distinct, under-developed competence: in this sample it is precisely the competence enterprises need most and have least, a mismatch this study is able to demonstrate empirically where Morgan et al. could only argue conceptually.

Taken together, these findings support the study's central conceptual contribution: that SME e-business literacy is not a single trait but a set of separable, unevenly held competences, of which training access, financial and records literacy, logistics literacy and legal-regulatory literacy are the ones that most differentiate SMEs' capability to adopt and run online platforms in the Tanzanian setting. The proposed framework (Section 4.4) operationalises this conclusion, in the spirit of design science research (Hevner et al., 2004; Peffers et al., 2007), by prioritising exactly these four gaps rather than treating e-business capacity-building as a single, generic training need, which is the study's principal contribution to both the adoption-theory and digital-literacy literatures and to the practice of SME support in Tanzania.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study assessed the level and determinants of SME e-business literacy in Tanzania and its effect on the capability to adopt and run online platforms, and proposed a preliminary capability framework. Using a cross-sectional quantitative survey design and field-collected data, it found that training access, financial-records literacy, logistics literacy and legal-regulatory literacy are the significant determinants of adoption capability, while legal-regulatory literacy and training access are the biggest literacy gaps. The framework offers a targeted, though not yet independently validated, path to stronger SME e-business capability. A few limitations apply: the sampling was non-probability (stratified and convenience), so results should be generalized with care despite strong scale reliability; the design was cross-sectional and self-report, with literacy and capability self-assessed rather than objectively tested; and the model explained only a modest share of the variance, so other factors clearly matter.

5.2 Recommendations

The findings translate into stakeholder-specific actions (Table 7). SMEs should build the weakest literacies first, especially legal-regulatory, logistics and record-keeping; trainers and business-support bodies should offer targeted, hands-on e-business training rather than generic digital courses; platform and payment providers should simplify onboarding and offer guided support; and government and regulators should improve access to training and clear guidance on data protection and e-commerce rules. Future research should confirm the measurement model with confirmatory factor analysis, use probability sampling, and pilot targeted training to test its effect on adoption and business performance.

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Table 7

Recommendations by Stakeholder

Stakeholder	Recommended action
SME owners and managers	Build targeted skills in the weakest areas (security, logistics, marketing)
Trainers and business-support bodies	Offer practical, local-language e-business training and mentoring
E-business platforms and MNOs	Simplify onboarding and provide in-app guidance for small sellers
Government and regulators	Support SME digitalization, delivery infrastructure and consumer trust
Universities and training institutes	Embed e-business literacy in entrepreneurship curricula

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