

# Determinant of Electronic Banking Adoption on Entrepreneurial Performance of SMEs in Nasarawa State

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### ABSTRACT

Electronic banking offers small-and-medium enterprises (SMEs) faster payments, richer cash-flow data and wider market reach, yet adoption rates remain uneven in Nigeria. This study investigated how four adoption determinants of perceived ease of use, service reliability, service awareness and trust affect the entrepreneurial performance of SMEs in Nasarawa State. A quantitative survey was carried out in the study, in which a five-point Likert questionnaire was administered to a Yamane-derived sample of 347 owner-managers (drawn from the 1,816 SMEs registered with the State Ministry of Commerce and meeting a 36-month ownership threshold). Multiple regression analysis at the 0.05 level revealed a model with high explanatory power ( $R = 0.857$ ;  $R^2 = 0.734$ ;  $F = 472.399$ ,  $p < 0.05$ ). Trust emerged as the strongest predictor of performance ( $\beta = 0.368$ ,  $p < 0.05$ ), followed by Perceived Ease of Use ( $\beta = 0.342$ ,  $p = 0.016$ ), Service Awareness ( $\beta = 0.203$ ,  $p = 0.000$ ), and Service Reliability ( $\beta = 0.185$ ,  $p = 0.000$ ). These findings confirm that confidence in reliability and integrity of the service, intuitive interfaces, informed familiarity and dependable platforms jointly enhance SME profitability, growth and operational efficiency. The study recommends: (1) banks and fintech should simplify app and POS interfaces through local-language prompts and streamlined menus; (2) providers must fortify system reliability via redundant infrastructure and rapid incident-response protocols; (3) government–industry partnerships should mount targeted awareness clinics in local markets to demonstrate e-banking’s concrete business benefits. Implementing these measures is expected to accelerate digital-finance uptake and, consequently, bolster SME performance across Nasarawa State; and e-banking service providers should implement and visibly communicate robust security protocols to strengthen the confidence of operators of SMEs in electronic banking platforms.

**Keywords:** Electronic Banking, Entrepreneurial, Performance, SME, Nasarawa, fintech



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## INTRODUCTION

Small and Medium Enterprises (SMEs) supply the backbone of the world economy roughly 90 % of all firms and more than half of global employment and yet they still face disproportionate financing gaps that digital tools could help close (World Bank, 2024). Cross-country evidence shows that the share of firms using fully digital payment and online-banking platforms has climbed to 58 %, but one out of two SMEs still rates its overall digital maturity as only basic or emerging, with training costs, cyber-security worries and hardware prices topping the list of barriers (OECD D4SME Survey, 2025). Econometric work across 21 OECD countries further links a 10 % rise in financial-sector digitalization to a 0.1-percentage-point acceleration in average industry productivity, with the gains strongest for intangible-intensive sectors that typically include fast-growing young firms (Bontadini et al., 2024). Global micro-level studies echo these patterns highlighting perceived usefulness, compatibility, access, website quality and trust in service security as dominant drivers of e-banking uptake (Ayinaddis et al., 2025; Al-Zu'bi & Ahmad, 2016).

Small and Medium Enterprises (SMEs) make up more than 90 % of all Nigerian businesses, yet their size, structure and growth trajectories vary widely across states. In Nasarawa State, the first comprehensive enumeration by SMEDAN and the National Bureau of Statistics counted just 382,086 micro-, small- and medium-sized enterprises in 2013 one of the lowest state totals at the time (SMEDAN & NBS, 2013). Subsequent competitiveness rankings show the state climbing to reasonable level nationwide on the SME momentum indicator, with roughly 2,604 active SMEs employing about 103,000 workers by 2018 (Kingmakers, 2020). Even so, only about 1,816 firms are formally registered with the Ministry of Commerce and Industries in Lafia as of 2022, underscoring a persistent formalization gap that limits access to finance and growth-enhancing innovations (Nasarawa State SMEs survey, 2022; Yakubu et al., 2024).

One innovation with transformative potential is electronic banking (e-banking). Nigeria's cash-less policy, coupled with the rapid diffusion of mobile money, drove the value of instant payments handled by the Nigeria Inter-Bank Settlement System (NIBSS) from ₦600 trillion in 2023 to ₦1.07 quadrillion in 2024, a 79.6 % year-on-year leap (Adepetun, 2025). For resource-constrained SMEs, e-banking promises shorter settlement cycles, lower cash-handling costs and easier access to distant customers and suppliers, making adoption a potentially decisive lever for competitiveness and survivability.

Empirical studies across Nigeria point to a consistent bundle of factors that shape SMEs' willingness to adopt e-banking. A survey of Bauchi-based firms finds that perceived ease of use, service reliability and awareness campaigns significantly predict uptake, whereas security

concerns suppress it (Adamu et al., 2024). A nationwide study of 300 Lagos owners shows that perceived usefulness, compatibility with existing routines and top-management support explain 52 % of the variance in e-payment usage intensity (Adesina et al., 2025). Similar patterns emerge in Akwa Ibom, where infrastructure quality and user education moderate the ease-of-use–adoption link (Ele et al., 2024). Collectively, these results confirm technology-acceptance logic: both technological attributes (network uptime) and organizational attributes (owner skills, trust) matter.

Evidence also links e-banking adoption to superior entrepreneurial performance. Using a large multi-state panel, Adesina et al. (2025) find that electronic-payment intensity accounts for more than half the variation in SME profitability and nearly half the variation in customer-base growth. In south-western Nigeria, point-of-sale (POS) usage is positively and significantly associated with operational efficiency even when internet-banking and ATM channels show weaker effects (Ogunwale et al., 2024). Among Uyo-based firms, ATM and mobile-transfer usage correlate with gains in sales turnover and market reach, although these benefits are moderated by infrastructure gaps (Ele et al., 2024). Once initial barriers are overcome, e-banking appears to operate as a strategic asset that shortens cash cycles, broadens market access and improves record-keeping—all critical ingredients of entrepreneurial success.

Despite Nigeria's decade-long cash-less policy, formalized in the Central Bank of Nigeria's (CBN) nationwide cash-handling charges and electronic-payment drive (CBN, 2024) and the surge of instant-payment values (NIBSS, 2025), many of the 1,816 SMEs registered in Nasarawa State still transact largely in cash. Recent SMEDAN/MSME survey snapshots show that < 50 % of these firms have activated any e-banking channel (SMEDAN, 2021). Field evidence echoes three persistent bottlenecks: owners doubt the ease of using banking apps, question the reliability of networks that suffer frequent glitches (Ele, Iteire & Okolie, 2024; Moss & Thomas, 2022), and possess only sketchy awareness of digital products beyond ATM withdrawals, especially in rural LGAs where financial-literacy campaigns are sparse (Ayinaddis, et al., 2025). These gaps trap entrepreneurs in high-cost, low-speed cash routines that weaken profitability and blunt Nasarawa's economic-diversification ambitions.

Extant literature largely analyses e-banking adoption in metropolitan hubs such as Lagos, Johannesburg or Dhaka, emphasizing either behavioural intention (Kitigin, 2025; Nahar, 2022) or customer satisfaction (Beshir & Zelalem, 2020) rather than firm-level performance. No empirical study has simultaneously tested perceived ease of use, service reliability and service awareness as joint predictors of entrepreneurial performance within

Nasarawa's SME community, nor has prior work integrated these determinants into a unified model that moves beyond adoption to measurable business outcomes. By targeting this overlooked geography and coupling adoption factors with performance metrics, the present research fills this gap and provides context-specific evidence to guide banks, policymakers and development agencies in accelerating digital-finance uptake where it is most needed. Accordingly, the study was aimed at achieving the following objectives.

- i. To examine effect of PEOU on SME performance in Nasarawa State.
- ii. To assess impact of service reliability on SME performance in Nasarawa State.
- iii. To evaluate role of service awareness on SME performance in Nasarawa State.
- iv. To examine the effect of trust on SME performance in Nasarawa State.

In line with the objectives, the following hypotheses were formulated for testing.

**H0<sub>1</sub>:** Perceived ease of use does not have significant effect on SME performance in Nasarawa State.

**H0<sub>2</sub>:** Service reliability does not have significant effect on SME performance in Nasarawa State.

**H0<sub>3</sub>:** Service awareness does not have significant effect on SME performance in Nasarawa State.

**H0<sub>4</sub>:** Trust does not have significant effect on SME performance in Nasarawa State.

## LITERATURE REVIEW

### Perceived Ease of Use

Perceived ease of use is defined as the degree to which operating a technology demands little or no cognitive or physical effort. Carranza et al. (2021) framed it as the degree to which a person believes that using a particular system is effortless, both physically and mentally, while Xu et al. (2021) emphasized that it involves no extra effort beyond a user's normal routine. Nguyen (2020) described perceived ease of use simply as the belief that system use will be effort-free, and Alipour et al. (2019) added that technologies perceived as easy to learn and operate face fewer adoption barriers. Together, these definitions converge on two attributes, simplicity of the interface and low mental or physical burden as the essence of the construct.

Studies further highlighted perceived ease of use's link to user confidence and adoption intent. Wiwoho (2019) defined it as a system that is easy to understand without using more effort, a notion later echoed by Wilson et al. (2021), who argue that user-friendly design fosters

positive attitudes toward technology. Because users interpret an intuitive, uncomplicated system as low risk, high trust and readily controllable, higher perceived ease of use reliably predicts stronger willingness to adopt and sustained use across contexts. In short, perceived ease of use captures how straightforward, clear and labor-saving a technology feels to its intended audience, a perception that functions as a catalyst for technology acceptance.

### Service Reliability

Service reliability is most commonly described as an organization's ability to deliver the promised service dependably, accurately, and on schedule. Building on the seminal SERVQUAL wording by Parasuraman, Zeithaml, and Berry (1988), scholars sharpen the definition for digital settings. Rizkina et al. (2025) emphasized accuracy and timeliness, calling reliability as the staff's capacity to provide the promised service accurately, consistently, and on time. In an e-banking context, Malc et al. (2023) used the term fulfillment to denote the extent to which online services are delivered exactly as advertised and meet user expectations. Extending the idea of consistency, Ali et al. (2025) stress that a reliable provider performs optimally under varying conditions, meaning every transaction is processed correctly even during peak loads or network fluctuations. Outside banking, Bitkina et al. (2022) defined reliability in tele-health apps as doing the right thing at the right time, the first time, while Chaghoeue and Zarei (2021) described it in public-service platforms as uninterrupted accessibility coupled with correctness of information.

Across these definitions, four recurring attributes emerge: dependability (customers can count on the service), accuracy (error-free execution), timeliness (delivery within the agreed window), and consistency across contexts (stable performance regardless of traffic or environment). By framing reliability as the convergence of these attributes, authors reveal a single conceptual thread: a service is reliable when it keeps its promises every time without defects or delays. Whether labelled fulfillment (Malc et al., 2023), effort-free correctness (Bitkina et al., 2022), or uninterrupted accuracy (Chaghoeue & Zarei, 2021), the concept ultimately centres on the provider's unwavering capacity to execute the required task precisely as pledged.

### Service Awareness

Service awareness denotes a user's state of knowing that a service exists and understanding its key features, benefits, and access pathways. At its core, it is a cognitive condition of consciousness about an offering. Thus, Haridy (2022) framed the term as being conscious, possessing knowledge, or being informed about a

specific service, while Al-Mohammadi and Al-Dulaimi (2022) defined customer service awareness as the extent to which potential consumers know the products or services offered by the organization, including insight into how those offerings match their own needs. In practical terms, high awareness implies that the target audience can readily describe where the service is available, what value it provides, and how to make use of it.

Studies emphasized that awareness is a prerequisite for adoption: people must first recognize a service before they can evaluate or use it. Prapdopo et al. (2024) stress that awareness arises when providers supply clear information, enabling clients to recognize the service's value and availability. Echoing this, Niekerk and Saayman (2013, as cited in Ervina & Octaviany, 2022) sees it as knowledge of the existence of something. Al balushi (2021) defined-services as services offered over the adopted Information and Communication Technology (ICT). Awareness, therefore, reflects the degree to which customers know about, understand, and recognize the availability and benefits of these services delivered through digital platforms. These services are becoming increasingly important with continuously developed application in various domains (business, government, education and health) as these services provide benefits to all parties concerned from service providers, service users and the society (Al balushi, 2021). Collectively, these definitions converge on the idea that service awareness is the informed recognition that a service is both available and relevant, without which subsequent adoption and value creation cannot occur.

## Trust

Trust, in the context of the study, refers to the degree of confidence that users of e-banking services have in the reliability, integrity, and security of digital financial platforms and the institutions that provide them. Máté et al. (2026) point out trust comprise factors such as integrity, credibility, and benevolence, that influence attitudes toward internet banking adoption. Taneja et al. (2024) add that trust effectively reduces perceived risk, thereby lowering psychological barriers to adoption in uncertain operational environments. Without adequate trust, concerns regarding fraud, data theft, system failure, and transaction errors may disproportionately constrain adoption (Reza et al., 2026). When SME operators trust that e-banking platforms are secure, dependable, and capable of delivering efficient financial services, they are more likely to integrate such technologies into their daily business operations. This integration can enhance transaction speed, reduce operational costs, and improve overall entrepreneurial performance. Safitri and Palupi (2026) confirmed that perceived trust significantly influences the acceptance of financial technology services, so that low levels of trust can significantly hinder adoption; limited trust in digital payments remains

a persistent constraint, leading users, particularly in rural and underserved communities, to rely on traditional, less efficient financial methods (Taneja et al., 2024). Thus, trust functions as both a prerequisite for initial adoption, as well as a sustaining factor that reinforces continued usage and long-term integration of e-banking in entrepreneurial activities (Máté et al., 2026; Safitri & Palupi, 2026). For SME operators in Nasarawa State, building trust in e-banking systems may, therefore, represent a foundational condition for achieving the performance enhancing benefits of digital financial inclusion.

## Entrepreneurial Performance

Entrepreneurial performance is the composite measure of what an entrepreneur or venture achieves over a given period, encompassing both objective outputs and subjective fulfillment. At its most basic, it is the work results achieved by entrepreneurs in carrying out their duties and responsibilities (Sanjaya & Rahyuda, 2025), or, put differently, the accumulated outputs of the entrepreneur's efforts over time (Fried & Tauer, 2015). Dong et al. (2020) defined entrepreneurial performance as the entrepreneur's satisfaction with the venture's results, capturing whether outcomes meet individual aspirations. Others emphasized concrete metrics as Shane and Nicolaou (2013) equated performance with profit growth and business expansion, while Muindi et al. (2021) extended it to firm performance, personal wealth generation, and social value created by the entrepreneur. As highlighted by Jayachandran (2023), business success is gauged by its commercial effectiveness; this is the capacity to achieve its goals and anticipated outcomes. Jayachandran adds further that the evaluation of enterprise performance brings clarity and reveals requisites for alignment business vision. It also helps in framing future policies; the evaluation of the effectiveness of past strategies is essential in the formulation of future strategies based on the results. Eniola et al. (2019) treat enterprise performance as the degree to which both long- and short-term goals are met, whereas Del Giudice et al. (2019) and Kpurunee et al. (2023) described performance generically as the extent to which a venture attains its strategic objectives. Taken together, entrepreneurial performance denotes the venture's economic health and growth trajectory alongside the entrepreneur's personal and social success, making it a multidimensional yardstick for evaluating entrepreneurial outcomes.

## Empirical Review

### Perceived Ease of Use and Entrepreneurial Performance

Empirical evidence from several studied consistently

shows that when entrepreneurs perceive electronic-banking interfaces as effortless to learn and operate, measurable business gains follow. In Vihiga County, Kenya, Kitigin (2025) surveyed 455 micro- and small-enterprise (MSE) owners and found a strong, direct relationship between perceived ease of use of e-banking and overall firm performance, owners who agreed that e-banking requires little mental effort reported higher profits and faster sales growth. A similar pattern emerged in Bangladesh, where Nahar (2022) demonstrated that online-payment adoption improved SME outcomes for both male and female entrepreneurs, but perceived ease of use mattered more to women, underscoring the value of intuitive, low-friction user experiences for inclusive growth. Cameroon's post-COVID recovery study by Lontchi et al. (2023) echoed these findings. The study surveyed 381 SMEs that deemed fintech apps easy and approachable and complemented that usability with basic financial-literacy training registered significant operational and financial improvements.

Using data from 352 firms in Jigawa State, Nigeria, Usman et al. (2025) showed that perceived ease of use boosted entrepreneurs' participation in digital finance, which then mediated stronger sales and profitability; usefulness remained the sole direct predictor, but ease of use was indispensable in widening access. In Sri Lanka, Thathsarani and Jianguo (2022) reported that when SMEs found mobile-banking platforms simple, the positive effect of access-to-finance initiatives on performance was amplified, with digital-finance and TAM variables jointly explaining roughly 60 % of the variation in firm outcomes. Taken together, these results suggest that intuitive design multiplies the impact of financial-inclusion programmes, turning mere access into tangible growth.

Applying the Unified Theory of Acceptance and Use of Technology (UTAUT) model to 313 Zambian bank clients, and Phiri (2019) identified effort expectancy essentially perceived ease of use as a key trigger of e-banking uptake; they argue that while the survey did not measure profits directly, smoother interfaces shorten transaction times and cut costs, paving the way for better entrepreneurial performance. Across all six studies, the policy prescription is clear: banks and fintech providers should prioritise clean screen layouts, local-language prompts and responsive support, while governments and trade groups reinforce these efforts with targeted training. By lowering cognitive barriers at the very first click, stakeholders enable SMEs to unlock the full efficiency, cost-saving and market-expansion benefits of electronic banking.

### **Service Reliability and Entrepreneurial Performance**

Empirical work across converges on the point that poor service reliability blocks SMEs from realising the performance upside of electronic banking. Moss and

Thomas (2022) interviewed frontline staff in a major regional bank and learned that SMEs routinely experienced hour-long outages and "ghost" transactions that never settled; these incidents bred distrust and cut adoption rates to well below 40 % of the bank's SME portfolio. A comparable picture emerged in Bangladesh: using document review and key-informant interviews, Ahmed et al. (2025), in a similar study conducted among customers in Bangladesh, found that poor service quality and inconvenience were among the most crucial factors determining customers dropping e-banking service providers. Both studies recommend heavy capital spending on redundant servers, real-time monitoring dashboards, and multi-layer fraud controls, arguing that visible uptime improvements would move hesitant firms into regular digital use and unlock speed-of-payment and wider-market benefits.

In Ethiopia, Beshir and Zelalem (2020) surveyed 385 customers (25 % SMEs) and showed via multiple regression that a one-point rise on the five-point reliability scale lifted overall satisfaction by 0.46 points ( $p < .001$ ), which in turn predicted continued e-banking use. Likewise, a Nepalese study of 137 business and retail users by Maharjan and Raya (2024) reported that reliability had the strongest standardized path coefficient to satisfaction ( $\beta = 0.57$ ), dwarfing responsiveness ( $\beta = 0.31$ ) and assurance ( $\beta = 0.18$ ). Both authors stress continuous infrastructure audits and automatic fail-over mechanisms; they also call for SMS notifications and quick-error correction tools so entrepreneurs can trust digital channels for daily cash-flow management an efficiency gain that translates into higher net margins and better working-capital control.

Analyzing 352 SMEs with PLS-SEM, Usman et al. (2025) found that responsiveness timely resolution of e-banking problems had a significant direct effect on profitability ( $\beta = 0.29$ ,  $p < .05$ ), whereas ease of use worked only indirectly through greater financial inclusion. They recommend 24/7 help-lines, sub-24-hour dispute resolution, and proactive downtime alerts so firms can schedule transactions confidently. Field data from Akwa Ibom State corroborate this: 64 % of respondents in Ele et al. (2024) said POS or ATM failures had forced them to lose sales in the previous month, and each additional unresolved incident was associated with a 3 % dip in monthly turnover. The authors urge banks to pair network upgrades with on-site technician teams and rapid card-replacement protocols to restore trust. Taken together, these findings show that reliability both technical and service-support acts as a gateway variable: when it is low, firms stay partly or fully outside the digital loop; when it is high, e-banking becomes a dependable engine for faster transactions, cost savings, and revenue growth.

### **Service Awareness and Entrepreneurial Performance**

Low awareness of electronic-banking (e-banking) options

has repeatedly been shown to suppress digital adoption and, by extension, firm-level performance. In Nigeria, Ele et al. (2024) surveyed SMEs in Akwa Ibom State and found that barely 52 % of respondents could name more than one cash-less channel suitable for business, and only 39 % actively used POS or Internet banking for sales settlement. Owners who were aware of multiple channels reported shorter cash-conversion cycles and a mean monthly cost saving of ≈ ₦36,000 compared with cash-only peers. The authors attribute the gap to limited outreach by banks and recommend joint public-private roadshows, radio jingles and trader-association clinics that demonstrate real-time cost and security advantages. A national fintech study by Usman et al. (2025) reinforces this: in a 352-firm PLS-SEM model, perceived ease of use lifted performance only through financial-inclusion awareness; every one-unit increase in awareness raised fintech utilization by 0.42 units ( $p < .05$ ), which in turn added 0.31 units to profit growth. Similarly, an Ethiopian customer-level analysis by Ayinaddis et al. (2025) showed that in rural zones where just 23 % of micro-entrepreneurs had heard of mobile banking, transaction-processing times were twice as long as in urban areas. The authors call for village-level demonstrations, vernacular video tutorials and micro-agent coaching to close the literacy gap.

Qualitative work underscores that lack of peer examples and social proof also dampens uptake. Interview data from the Common Monetary Area collected by Moss and Thomas (2022) revealed that many SMEs still trust what they see, if no neighbouring firm uses e-banking, owners assume it is risky or irrelevant. Bank staff reported that live demonstration sessions where experienced users walked their peers through typical business transactions doubled sign-up numbers at pilot branches. In India, Vengatesh (2023) noted that a large number of people are unfamiliar with the ease of online transactions, secure payment methods, and accessibility of digital banking platforms. Because of this, they are not able to fully benefit from the advantages of streamlined financial management, efficient fund transfers, and time-saving options offered by digital banking. The author recommended addressing this problem by ensuring that individuals are equipped with the knowledge and understanding necessary to confidently navigate the digital banking landscape and harness its full potential. Both studies stress that awareness drives must be paired with visible reliability; when owners are invited to try the system in real time and see instant confirmations, scepticism falls sharply.

### Trust and Entrepreneurial Performance

Trust has been widely recognized in literature to exert strong effect on e-banking adoption, which in turn, translates into business performance. Marcevičiūtė et al. (2025), for example, carried out a study in Lithuania,

aimed at assessing the adoption of e-banking services. Using an explanatory research design, survey data was obtained from a cross-section of 104 business operators, and analyzed using PLS-SEM. Findings from estimated results showed that trust exerted strong and statistically significant effect. This emphasized the provision of secure processes as users prioritized the safety of their financial information.

### Theoretical Framework

#### Technology-Acceptance Model (TAM)

The Technology-Acceptance Model (TAM) was first articulated by Fred Davis (1989). Davis proposed that an individual's decision to adopt an information system is largely explained by two cognitive beliefs: Perceived Usefulness (PU) the degree to which using a technology is expected to enhance job performance and Perceived Ease of Use (PEOU) the degree to which using it is free of effort. These beliefs shape the person's attitude toward the system, which in turn influences behavioural intention and, ultimately, actual use. By adapting Fishbein and Ajzen's Theory of Reasoned Action to an IT context, TAM offered a parsimonious, empirically testable framework that quickly became the "workhorse" for predicting technology uptake in organizational studies (Davis, 1989).

Subsequent researchers have extended and validated TAM across myriad settings from workplace groupware to mobile banking. Venkatesh and Davis et al (2000, 2003) introduced TAM2, adding social influence (subjective norm) and cognitive instrumental processes (job relevance, result demonstrability) to improve explanatory power. Empirical studies such as Ling et al. (2023), Putra et al. (2023) and Jonathan and Soelasih (2022) confirm that PU and PEOU consistently account for a substantial share of variance in intention and usage, although effect sizes vary by context. More recent work integrates TAM with domain-specific factors; e.g., trust for e-commerce (Kobane, 2023) or service-quality attributes for e-banking (Al-Hujran et al., 2023) demonstrating the model's adaptability while preserving its core logic.

Notwithstanding its influence, TAM faces several critiques. First, scholars argue that the model's parsimony can be a liability because it omits organizational, cultural and affective determinants that also shape adoption; Benbasat and Barki (2007) warn against "TAM-ification" of IS research, urging richer theorization. Second, TAM has been criticised for over-reliance on self-reported intention rather than objective use, potentially inflating explanatory power (Chuttur, 2009). Third, Bagozzi (2007) contends that the model lacks a solid psychological foundation for the attitudinal constructs, calling for a broader motivational perspective that includes emotion and habit. These critiques have spurred integrative frameworks such as the Unified

Theory of Acceptance and Use of Technology (UTAUT) and a stream of TAM variants that incorporate contextual variables. Nevertheless, TAM remains a foundational lens valued for its simplicity and robustness while contemporary studies increasingly position it as the core spine augmented with situational factors to capture the complexity of modern technology adoption.

In the context of Nasarawa State, the Technology-Acceptance Model suggests that SMEs will embrace electronic banking and reap the attendant performance gains only if owners believe the channels are both useful for their core business constraints (PU) and effortless to master (PEOU). In a setting where 1,816 of roughly 2,600 active SMEs are formally registered and many still rely on cash (Nasarawa State SMEs survey 2022; Yakubu et al., 2024), e-banking's perceived usefulness hinges on concrete benefits such as faster settlement with Abuja-based suppliers, reduced cash-handling risk along rural transport corridors, and simplified tax remittance to the Lafia revenue office. Perceived ease of use, meanwhile, will reflect how clearly local bank apps support Hausa or Eggon language prompts, the reliability of 4G networks in Keffi and Akwanga, and the availability of on-ground training by microfinance banks. When these two TAM levers are strengthened through awareness drives, interface localization, and dependable connectivity SME proprietors are more likely to adopt e-banking, embed it as an operational capability (real-time mobile POS, automated bookkeeping), and ultimately improve profitability, cash-flow velocity, and survival prospects in Nasarawa's evolving, but still infrastructure-constrained, business environment.

## METHODOLOGY

This quantitative study employed an explanatory research design in line with its causal orientation concerned with measuring the direct effects of perceived ease of use, service reliability and service awareness of e-banking on SME performance. The population of the study comprised owner-managers of all 1,816 Nasarawa State Ministry of Commerce registered SMEs in Nasarawa State. These businesses were registered with the eligibility criterion of at least 36 months of ownership/management.

The large population size, however, necessitated the use of a representative sample, which was achieved via the application of the Taro Yamane formula. Consequently, an appropriate sample size of 347 was determined for the study. Stratified random sampling was employed in the determination of sample proportions across the 13 Local Government Areas (LGAs) of the state which served as strata (Akwanga, Awe, Doma, Karu, Keana, Kokona, Lafia, Nasarawa, Nasarawa Eggon, Obi, Toto, Wamba, and Keffi).

Data used was in primary form, collected in a cross-sectional survey through the administration of a

structured questionnaire across the study area. Both validity and reliability measures were adopted to ensure the effectiveness of the questionnaire as a measurement instrument. The former involved the participation of four experienced researchers (two each from the Department of Entrepreneurship at Bingham University, Karu and the Department of Business Administration at Nasarawa State University, Keffi) in a vetting process where measurement items were evaluated for relevance and appropriateness of language. Additionally, evaluations were also carried out by a pretest sample; 50 respondents, participating in a pilot study were asked to comment on wording, clarity, and relevance of instrument items. Feedbacks were used in rewording ambiguous and confusing items and the removal of irrelevant items. 45 validated pretest responses were used in testing internal consistency reliability. Table 1 presents Cronbach's Alpha coefficients for each variable scale.

Alpha coefficients were greater than 0.7 for all retained variables scales, ensuring internal consistency. For the main study, copies of the questionnaire were distributed physically using the Pick-Up/Drop-Off approach, with the data collection process lasting a period of three weeks, and involving the help of four research assistants. Acquired data were utilized in the estimation of a multiple regression model expression a causal relationship between Perceived Ease of Use, Service Reliability, Service Awareness and Trust.

**Table 1:** Internal Consistency Reliability for Pretest

Scale	Alpha Coefficient
Perceived Ease of Use	0.905
Service Reliability	0.866
Service Awareness	0.915
Trust	0.873
SME Performance	0.906

Note. SPSS Output

## Model specification

The following Ordinary Least Squares (OLS) regression model was estimated for the study

$$SMEP = \beta_0 + \beta_1 PEOU + \beta_2 SERR + \beta_3 SERA + \beta_4 TRT + e$$

Where: -SMEP= SMEs performance, PEOU= Perceived ease of use, SERR= Service reliability, SERA= Service awareness, TRT = Trust, e = Error term

Hypotheses were tested at a 0.05 significance level.

## RESULTS

The cross-sectional survey carried out in the study involved that administration of 347 copies of the questionnaire to SME owners / managers across

**Table 2:** Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PEOU	315	1.00	5.00	4.00	0.94	-1.162	0.137	1.215	0.274
SERR	315	1.00	5.00	3.58	0.95	-0.364	0.137	-0.492	0.274
SERA	315	1.00	5.00	3.90	0.80	-0.731	0.137	0.654	0.274
TRST	315	1.00	5.00	3.85	0.89	-0.859	0.137	0.580	0.274
SMEP	315	1.00	5.00	3.98	0.94	-0.988	0.137	0.642	0.274

Note: SPSS Output.

Nasarawa State. However, out of this number, 315 copies were retrieved and retained for further analysis representing an effective response rate of 91%. Prior to conducting the main regression analysis, the distributional properties of all study variables were examined. Table 2 presents the descriptive statistics, including means, standard deviations, skewness, and kurtosis for the five variables: Perceived Ease of Use (PEOU), Service Reliability (SERR), Service Awareness (SERA), Trust (TRST) and SME performance (SMEP). The sample comprised 315 valid responses, and all constructs were measured on a five-point Likert scale.

Mean scores for all five variables were above the midpoint of the five-point scale. The highest mean was observed for PEOU ( $M = 4.00$ ,  $SD = 0.94$ ), followed closely by SMEP ( $M = 3.98$ ,  $SD = 0.94$ ). SERA ( $M = 3.90$ ,  $SD = 0.80$ ) and TRST ( $M = 3.85$ ,  $SD = 0.89$ ) occupied moderately high positions, whilst SERR recorded the lowest mean ( $M = 3.58$ ,  $SD = 0.95$ ). The standard deviations ranged from 0.80 (SERA) to 0.95 (SERR), indicating adequate dispersion around the means. SERR demonstrated the greatest variability, suggesting comparatively wider differences in how participants perceived service reliability, whereas SERA displayed the most tightly clustered responses, reflecting a higher degree of consensus regarding awareness.

Based on the descriptive and distributional evidence, all five composite variables were found to exhibit acceptable psychometric properties and fell within the expected bounds of univariate normality for survey-based research. Skewness and Kurtosis values provided indications of the normality; given the sample size of 315, the conventional thresholds of  $\pm 2$  for skewness and  $\pm 7$  for kurtosis were adopted as the criteria for acceptable departure from normality. These cut-offs are preferred over formal significance tests such as Shapiro-Wilk, which are known to be excessively sensitive in larger samples and prone to flagging trivial deviations as statistically significant (Field, 2018). All five constructs exhibited negative skewness, indicating that the bulk of responses gravitated towards the higher end of the measurement scale. SERR displayed the mildest negative skew ( $-0.364$ ), approaching symmetry and reflecting a relatively balanced spread of opinion. SERA ( $-0.731$ ), TRST ( $-$

$0.859$ ), and SMEP ( $-0.988$ ) demonstrated progressively stronger, though still moderate, leftward tendencies. PEOU registered the most pronounced negative skew ( $-1.162$ ), consistent with a ceiling effect wherein the majority of participants rated the system as easy to use. Importantly, all skewness values fell well within the prescribed bounds of  $\pm 2$ , indicating that no construct exhibited severe asymmetry capable of distorting the regression estimates.

The kurtosis values, on the other hand, presented a more varied pattern. SERR was the sole construct to record a negative kurtosis value ( $-0.492$ ), signifying a platykurtic distribution that is flatter and lighter-tailed than the normal curve. This implies that responses to relevance-based self-efficacy were distributed relatively evenly across the scale points, with fewer extreme scores than would be expected under normality. The remaining four constructs; PEOU (1.215), SERA (0.654), TRST (0.580), and SMEP (0.642); recorded positive kurtosis values, indicating leptokurtic tendencies characterized by more pronounced central peaks and somewhat heavier tails. PEOU exhibited the most elevated kurtosis, reflecting a strong consensus around high ease-of-use ratings coupled with a small but distinct cluster of markedly lower scores. All kurtosis values remained substantially below the threshold of  $\pm 7$ .

The consistent pattern of moderate negative skewness across the constructs is theoretically consistent with the technology acceptance paradigm, wherein perceptual variables such as ease of use and trust tend towards favourable evaluations when the system under study is functional. Although PEOU displayed the strongest departure from symmetry, the magnitude of skewness ( $-1.162$ ) and kurtosis (1.215) did not, on its own, pose a material threat to the validity of the regression findings. Notwithstanding, a definitive assessment of the normality assumption was conducted in the diagnostic phase of the regression analysis, where the standardized residuals were examined via histograms, normal probability plots. A number of regression diagnostic tests were carried out to ensure that pertinent assumptions are met, as well as to avoid spurious results. The most important is the evaluation of multicollinearity. This was assessed using Variance Inflation Factor (VIF) and Tolerance values. As

**Table 3:** Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0.857	0.734	0.731	0.32724	2.000

Note: SPSS Output.

**Table 4:** ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	235.945	4	58.986	472.399	0.000
Residual	38.708	310	0.125		
Total	274.653	314			

Note: SPSS Output.

shown in (Table 3), all VIF values ranged from 2.013 to 2.974, which were well below the conservative threshold of 5, and all Tolerance values exceeded 0.2. This indicates that multicollinearity was not a concern among the predictor variables.

Additionally, the assumption of normality of residuals was assessed. Figure 1 depicts a normal P-P Plot of Regression Standardized Residual plotting the cumulative probability of observed residuals against the cumulative probability expected. The plot showed that the points closely followed the diagonal line, with no substantial systematic deviations. Combined with skewness and kurtosis values (see Table 2), this supported the assumption of normally distributed errors. The test for autocorrelation was conducted with the use of the Durbin-Watson statistics. As shown in (Table 3), the Durbin-Watson statistic was 2.00, confirming no autocorrelation in the residuals and satisfying the assumption of independent errors.

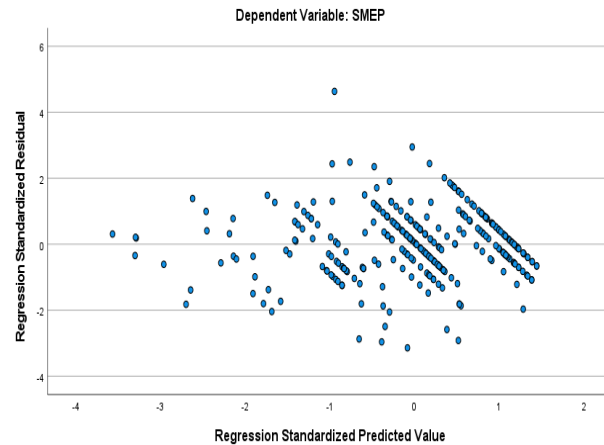
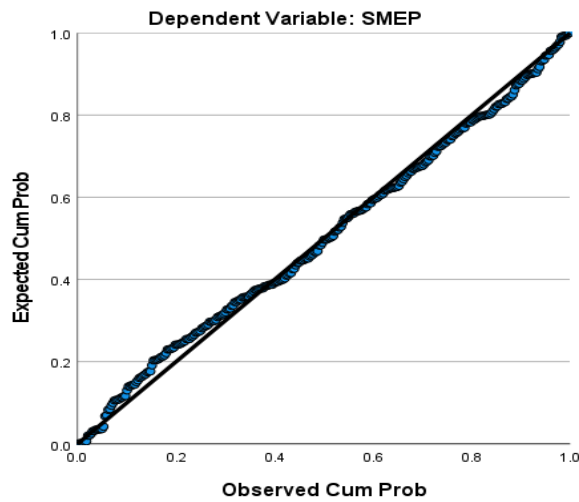
Figure 2 depicts a scatterplot showing the relationship between the standardized predicted values and the standardized residuals for the dependent variable (SMEP). The plot shows the residuals to be randomly scattered around the zero line, which is a good indication that the assumption of linearity is reasonably satisfied. There is no clear curved pattern or systematic structure, suggesting that the model captures the linear relationship adequately. However, there is a noticeable slight clustering and diagonal banding of points, especially toward the right-hand side of the plot (higher predicted values). This pattern may indicate some mild heteroscedasticity, meaning that the variance of the residuals is not perfectly constant across all levels of predicted values. However, this is not a serious issue. The plot generally confirms that the linearity assumption was met, as well as the fact that there was no severe violation of homoscedasticity.

Table 3 presents model summary information, including the Coefficient of Multiple Determination ( $R^2$ ) and the Durbin Watson statistic. The computed adjusted  $R^2$  value of 0.731, indicates that about 73% of variations in the dependent variable, SME Performance, was attributable

to the independent variables in the model. This indicates a strong linear relationship between the set of predictor variables and the dependent variable, SMEP. This represents a substantial proportion of explained variance and suggests that the model possesses considerable explanatory power. The adjusted  $R^2$  value of 0.731 closely approximates the unadjusted  $R^2$ , differing by only 0.3 percentage points. This negligible shrinkage indicates that the model was not over fitted and that all included predictors contributed meaningfully to the explanation of SMEP. Had one or more irrelevant predictors been included, a more pronounced discrepancy between the two values would have been observed.

The Durbin-Watson statistic of 2.000 indicates a complete absence of first-order autocorrelation in the residuals. Values deviating substantially below 1.5 or above 2.5 would raise concerns regarding the independence of errors assumption. The present result therefore provides unequivocal evidence that the residuals are independent of one another. This finding is consistent with the cross-sectional nature of the data, wherein each observation represents a distinct respondent with no inherent sequential ordering. These results provided a sound foundation upon which to proceed with the examination of the individual regression coefficients and the remaining diagnostic assessments. The Analysis of Variance (ANOVA) results provided strong, unambiguous evidence that the regression model, comprising PEOU, SERR, SERA, and TRST as predictors of SMEP, was statistically significant (see Table 4). This, in conjunction with the substantial  $R^2$  value (0.734) and the reported satisfactory Durbin-Watson statistic, affirmed the overall fit and validity of the model and allowed for a meaningful examination of the individual predictor effects. The F-test was used to evaluate the null hypothesis that all regression coefficients in the population were equal to zero; that is, that the set of predictors collectively has no predictive utility for SMEP.

The F-ratio of 472.399, with 4 and 310 degrees of freedom, was statistically significant at 5% alpha level. This finding compelled the rejection of the null hypothesis



**Figure 1:** Normal P-P Plot of Regression Standardized Residual. **Figure 2:** Scatter Plot for Linearity and Heteroscedasticity Note: SPSS Output.

**Table 5:** Estimated Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	-0.253	0.104		-2.430	0.016		
PEOU	0.342	0.034	0.345	10.004	0.000	0.382	2.615
SERR	0.185	0.030	0.188	6.215	0.000	0.497	2.013
SERA	0.203	0.038	0.173	5.367	0.000	0.437	2.287
TRST	0.368	0.039	0.349	9.489	0.000	0.336	2.974

Note: SPSS Output.

and confirmed that the four predictors, as a set, significantly predicted SMEP. The magnitude of the F-statistic, substantially exceeding conventional critical values at the 0.05 alpha level, reflected the high proportion of explained variance ( $R^2 = 0.734$ ) and the adequate sample size, which together afforded considerable statistical power. The individual contributions of PEOU, SERR, SERA, and TRST were evaluated through the examination of the standardized and unstandardized regression coefficients, their associated t-statistics, and their corresponding significance values. These results are presented in (Table 5), and subsequently interpreted. The unstandardized coefficients represent the expected change in SMEP, measured on the original five-point scale, for a one-unit increase in the predictor, holding all other variables constant.

**Test of Hypotheses**

**H0<sub>1</sub>:** Perceived ease of use does not have significant

effect on SME performance in Nasarawa State

The coefficient for perceived ease of use (PEOU) was estimated to be positive and highly significant ( $B = 0.342$ ,  $t = 10.004$ ,  $p < 0.005$ ). This implies that, holding SERR, SERA, and TRST constant, a one-unit increase in PEOU is associated with an increase of 0.342 units in SMEP. The standardized beta ( $\beta = 0.372$ ) shows PEOU exerted the strongest relative influence among the three predictors. Because the p-value was well below the 0.05 threshold, the null hypotheses was rejected ( $H0_1$ ). Therefore, the study concludes that ease of use has a significant, positive effect on SME performance in Nasarawa State.

**H0<sub>2</sub>:** Service reliability does not have significant effect on SME performance in Nasarawa State

For service reliability (SERR), the unstandardized coefficient was estimated to be 0.185 ( $t = 6.215$ ,  $p < 0.05$ ). With all other predictors held constant, a one-unit

increase in SERR corresponds to an increase of 0.185 units in SMEP. The effect is statistically meaningful. Given the p-value is below 0.05, the null hypothesis ( $H_{0_2}$ ) is rejected; this affirms that higher service reliability significantly enhances SME performance in Nasarawa State.

**$H_{0_3}$ :** Service awareness does not have significant effect on SME performance in Nasarawa State.

The regression coefficient for service awareness (SERA) was also positive, significant contribution ( $B = 0.203$ ,  $t = 5.367$ ,  $p < 0.001$ ). Holding PEOU, SERR, and TRST constant, therefore, a one-unit increase in SERA is associated with an increase of 0.203 units in SMEP. With the p-value below 0.05, the null hypothesis is rejected ( $H_{0_3}$ ). The study concludes that greater awareness of e-banking services significantly improves SME performance in Nasarawa State.

**$H_{0_4}$ :** Trust does not have significant effect on SME performance in Nasarawa State.

An evaluation of standardized coefficients showed that TRST ( $\beta = 0.349$ ) and PEOU ( $\beta = 0.345$ ) emerged as the two strongest predictors of SMEP, with virtually equivalent standardized effects. These were followed by SERR ( $\beta = 0.188$ ) and SERA ( $\beta = 0.173$ ), which, while statistically significant, exerted comparatively weaker influence. The near-identical Beta values for TRST and PEOU suggest that trust and perceived ease of use contribute almost equally to the prediction of SME performance. Service reliability and awareness, on the other hand, contribute meaningfully but to a lesser degree. This pattern suggests that performance is primarily driven by users' trust in the platform and their perception of its ease of use, whilst the reliability and awareness of e-banking services play supplementary roles.

## DISCUSSION

The regression results confirm that perceived ease of use has a significant effect on SME performance in Nasarawa State. The findings echo Kitigin's (2025) Kenyan survey, which showed that simple, low-effort e-banking interfaces lifted profits and growth, and align with Nahar's (2022) Bangladeshi findings that ease of use was the decisive adoption trigger especially for female-led firms. Likewise, Usman et al. (2025) found that ease of use indirectly enhanced performance via financial inclusion for Nigerian SMEs. The present study therefore reinforces a pattern that intuitive digital platforms reduce cognitive barriers, drive heavier usage, and translate directly into sales

expansion, faster cash cycles, and higher profitability. Service reliability also emerges as a significant predictor of performance. This result is consistent with Maharjan and Raya's (2024) Nepalese study, where reliability was the strongest predictor of online-banking satisfaction, and with Moss and Thomas's (2022) work in the Common Monetary Area, which stressed that downtime and transaction errors erode SMEs' trust and dampen adoption benefits. However, the moderate effect size in Nasarawa contrasts with the more dominant role reported by Beshir and Zelalem (2020) in Ethiopia, suggesting that while reliability matters, local owners may have learned to tolerate a certain level of service interruption provided the system is easy to use. Still, the positive coefficient affirms Ele et al.'s (2024) recommendation that Nigerian banks invest in faster incident resolution and stronger infrastructure if they wish to unlock the full performance potential of e-banking.

Service awareness also shows a statistically significant on SMEs performance in Nasarawa State. This finding dovetails with Aynaddis et al.'s (2025) conclusion that digital-literacy gaps keep Ethiopian SMEs from exploiting online banking, and with Vengatesh's (2023) call for vigorous promotion in India. Yet the smaller effect size suggests that awareness campaigns in Nasarawa have achieved a baseline level of familiarity, owners largely know about e-banking but still need convincing on ease and reliability before usage intensifies. Together, the three variables explain 27 % of the variance in performance among Nasarawa SMEs.

Trust was found to be the strongest predictor of SME entrepreneurial performance in Nasarawa State, recording the highest standardized beta coefficient in the regression model. The variable is widely recognized as a critical enabler of digital financial inclusion, influencing users' willingness to adopt and continue using mobile banking, fintech platforms, and online financial services (Yacoubian, 2025). The finding of the study is theoretically coherent, given the substantial body of scholarly literature that consistently positions trust as essential in fostering the adoption and sustained use of digital financial technologies. Trust is widely recognized as a critical enabler of digital financial inclusion, exerting a decisive influence on users' willingness to adopt, engage with, and continue using mobile banking platforms, fintech applications, and online financial services more broadly (Yacoubian, 2025). In environments characterized by heightened perceptions of financial risk, institutional fragility, and technological uncertainty, the role of trust is fundamentally constitutive of whether adoption occurs at all.

The primacy of trust as an adoption determinant is well-established in the extant literature. Sijabat (2024) and Mulungula et al. (2023) both emphasize the essentiality of trust in driving e-banking adoption across developing economy contexts, collectively reinforcing the position

**Table 6:** Literature Comparison Table

Variable	This Study	2024–2026 Studies	Agreement
PEOU	Strong ( $\beta=0.342$ )	Strong	✓
Reliability	Moderate	Strong	Partial
Awareness	Weak-Moderate	Strong	Partial
Trust	Strong	Strong	✓

Note: Researcher's Compilation.

that trust functions as an indispensable antecedent to the acceptance of new financial technologies. These studies enshrine trust as a central, independently explanatory factor in technology acceptance frameworks. This function of trust is especially pertinent in the domain of digital payments and electronic banking, where users are required to share sensitive financial credentials through digital interfaces. The heightened salience of trust in digital financial contexts is further amplified by the escalating global and domestic incidence of cybercrime, data breaches, and digital financial fraud. Nigeria's financial system has experienced a marked rise in electronic fraud incidents in recent years; the Financial Institutions Training Centre (FITC) Fraud and Forgeries Report (2023) documented a substantial increase in e-banking fraud cases across Nigerian commercial banks, with mobile and internet banking channels accounting for a growing proportion of total fraud value

The strong and statistically significant positive effect of trust on SME entrepreneurial performance observed in this study carries several substantive implications. Most fundamentally, it demonstrates that higher levels of trust in digital banking transactions translate directly into superior entrepreneurial performance outcomes among Nasarawa State SMEs; when SME proprietors trust the electronic banking system, they are more willing to adopt and regularly utilize a broader range of digital financial tools, which in turn accelerates transaction velocity, reduces cash-handling costs and associated security risks, improves financial record-keeping quality, and ultimately enhances profitability and operational resilience (Al-Hujran et al., 2023; Mulungula et al., 2023). The results of this study are corroborated by a convergent pattern of findings in recent empirical literature, as summarized in (Table 6).

## Conclusion

This study set out to determine how the determinants of e-banking adoption (Perceived Ease of Use, Service Reliability, Service Awareness and Trust) influence the performance of SMEs in Nasarawa State. Multiple-regression analysis of 315 firms showed that all three variables exert positive and statistically significant effects on performance, explaining roughly 73% of the variance. Trust was found to be strongest predictor, highlighting the

critical role of confidence in data security, transaction integrity, and institutional reliability in driving higher levels of entrepreneurial performance. Perceived ease of use follows, highlighting the critical role of intuitive, low-effort e-banking interfaces. Service awareness and service reliability effects, though lower, also confirmed the importance of these two variables in attaining performance outcomes; SMEs still depend on error-free, always-on platforms to keep cash flows smooth, also entrepreneurs must first recognize and understand digital banking before they can exploit it. Taken together with earlier African and Asian evidence, the findings affirm that usability, dependability and informed familiarity are mutually reinforcing levers for translating e-banking adoption into tangible business gains.

## Recommendations

Accordingly, the following recommendations were made.

- i. Banks and fintech providers should streamline their apps and POS interfaces use local-language prompts, minimise menu layers, and embed tool-tips so that even first-time users can complete core transactions in a few clicks. Periodic usability testing with micro-entrepreneurs will ensure that improvements align with real SME workflows.
- ii. Invest in redundant network paths, automated fail-over servers and rapid incident-response teams to cut downtime and transaction errors. Complement these technical upgrades with visible safeguards (e.g., SMS confirmations, transaction-reversal guarantees) to rebuild trust and encourage heavier digital usage.
- iii. Regulators, trade associations and local micro-finance banks should run joint outreach clinics in markets and industrial clusters, pairing live demonstrations with short, vernacular training modules. Messages should emphasize concrete benefits faster payments, lower cash-handling costs and easier tax compliance to convert basic awareness into sustained adoption and, ultimately, higher SME performance.

iv. Financial institutions should implement and visibly communicate robust security protocols such as two-factor authentication, encryption assurances, and transparent fraud reimbursement policies to strengthen the confidence of operators of SMEs in electronic banking platforms.

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