

Digital Brand Credibility in Ghanaian Smes: Examining the Roles of Technological Capability, Strategic Flexibility and Industry 4.0 Implementation

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ABSTRACT

This study examines how Ghanaian small and medium sized enterprises can convert digital ambition into credible brand delivery. It develops an operational brand credibility perspective in which a brand promise becomes persuasive when internal systems repeatedly substantiate claims of reliability, responsiveness, transparency and customisation. Survey evidence from owners and managers of Ghanaian enterprises that had begun implementing Industry 4.0 technologies was analysed with partial least squares structural equation modelling. Technological capability and strategic flexibility were positively associated with implementation. Top management support also had a positive direct association with implementation, but it attenuated the marginal contributions of both capabilities. The interaction pattern suggests that leadership resources may substitute for dispersed organisational capabilities or that concentrated intervention may restrict specialist judgement and experimentation. The findings extend small enterprise branding research beyond communication by identifying the operating capabilities that make a digital brand promise performable. They also qualify the assumption that more senior management involvement is always beneficial. Managers should connect each technology investment to customer visible evidence, protect brand meaning through clear guardrails and distribute implementation authority to those with relevant expertise. The study positions operational capability as the organisational foundation upon which customer-based brand outcomes can subsequently develop.

Keywords: Brand credibility, brand orientation, digital branding, Industry 4.0, strategic flexibility, technological capability, Ghanaian SMEs

1. INTRODUCTION

A brand is credible when customers can treat its promise as a dependable guide to future experience. For small and medium sized enterprises, credibility is rarely produced by communication alone. It is produced through the repeated coordination of people, information, equipment and decisions. A firm may claim to be responsive, transparent or innovative, yet those associations remain fragile if orders cannot be traced, product quality varies or service recovery depends on the personal intervention of the owner. Branding is therefore an organisational accomplishment before it becomes a market asset. The distinction is increasingly important because digital channels allow small firms to amplify promises quickly while making performance failures equally visible.

Recent research confirms that digitalisation has altered the process through which small firms build brands. Fluhrer and Brahm (2026) organise this process around brand orientation, identity, marketing and performance and show that digital technologies affect every element. Spilotro (2025) similarly concludes that emerging technologies reshape digital marketing capability, customer interaction and internationalisation. These studies move branding beyond logo design and promotion, but the operating systems that substantiate digital brand claims remain underdeveloped. A customer portal can communicate transparency only if the underlying data are accurate. Automated production can signal consistency only if the technology is integrated into quality routines. Analytics can support responsiveness only if managers can act on the information. The unresolved issue is how small firms create this operational proof.

Industry 4.0 offers a theoretically useful setting for addressing that issue. The term describes interconnected technologies such as cloud systems, data analytics, sensors, automated equipment and digitally integrated processes. Verhoef et al. (2021) position digital transformation as an organisation wide change in strategy, structures, metrics and customer value, while Matarazzo et al. (2021) show how it can reshape value creation in SMEs. Frank et al. (2019) show that firms adopt Industry 4.0 technologies in patterns rather than as a single package. Their branding significance therefore lies less in possession than in configuration. When integrated into the value chain, the technologies can make delivery more reliable, reveal product provenance, accelerate service recovery and permit controlled customisation. When fragmented or poorly governed, the same investments can create inconsistent information, rigid processes and reputational exposure. Industry 4.0 implementation is consequently a potential infrastructure for brand credibility, not a brand outcome in itself.

This distinction is particularly consequential in Ghanaian SMEs. Their resource constraints can make sophisticated technology difficult to acquire and maintain, while concentrated owner authority can accelerate decisions yet also create bottlenecks. Market relationships often depend heavily on interpersonal trust and the reputation of the owner. Digital growth can therefore create an organisational scaling problem: the promise reaches more customers than the founder can personally supervise. Evidence from Ghana shows that ecommerce adoption contributes to SME performance through trust and that firm agility conditions the value realised from adoption (Anabila et al., 2024). The implication is directly relevant to branding. Digital access creates an opportunity, but trusted fulfilment and adaptive capability determine whether the opportunity becomes a durable brand association.

The present study reframes existing evidence on technological capability, strategic flexibility, top management support and Industry 4.0 implementation around operational brand credibility. The branding contribution in this study lies in theorising the tested outcome as a delivery infrastructure that can substantiate particular promises. This disciplined separation prevents a common validity error in which operational indicators are simply renamed as branding variables after data collection. It also produces a stronger argument: brand credibility requires capabilities that precede customer evaluation and can therefore be managed before market disappointment occurs.

Three questions organise the analysis. First, do technological capability and strategic flexibility support the implementation of systems that can generate brand relevant operational evidence? Second, does top management support strengthen those effects or change their marginal value? Third, what does the resulting configuration imply for brand governance in resource constrained enterprises? Dynamic capabilities theory explains how firms create and reconfigure the resources needed for implementation. Brand orientation explains why those resources should be directed toward a coherent market promise. Their integration permits a shift from digital branding as message production to digital branding as promise fulfilment.

The study makes four contributions. It introduces operational brand credibility as the link between internal digital implementation and the external promise. It distinguishes technological capability from strategic flexibility, showing why possession and reconfiguration perform different roles in brand delivery. It treats leadership as a contingent governance mechanism rather than an automatically beneficial resource. Finally, it provides evidence from Ghana, where capability scarcity and concentrated authority make the alignment problem especially visible. The paper proceeds through the branding and capabilities literature, develops four hypotheses, explains the method, reports the measurement and structural results and concludes with implications for scholarship, managers and enterprise support institutions.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Operational brand credibility

Customer based brand equity concerns the differential response created by brand knowledge (Keller, 1993). Brand orientation shifts attention inward by treating the brand as a strategic reference for culture, behaviour and resource allocation (Urde, 1999; Wong and Merrilees, 2005). These perspectives are complementary rather than competing. Customer meaning is ultimately located in the market, but the firm must organise the experiences from which that meaning is inferred. A credible brand therefore depends on congruence among identity, communicated promise and observed performance. For an SME with limited communications budgets, reliable conduct may be the most influential communication available.

Operational brand credibility refers here to the capacity of organisational systems to produce repeatable evidence consistent with a chosen brand promise. The idea has three boundaries. First, it is an enabling condition rather than a substitute for customer based brand equity. Second, it is promise specific. Faster processes add little brand value if the firm competes primarily on craftsmanship and the change damages perceived care. Third, credibility requires both competence and restraint. Digital traceability may strengthen trust, but only when the data are accurate, relevant and ethically governed. The concept therefore connects operations with branding without assuming that every efficiency improvement has market meaning.

Contemporary SME branding research supports this integrative view. Kusi et al. (2022) show that classical and entrepreneurial approaches to brand management can jointly improve the performance of internationalising SMEs. Ranjan (2024) demonstrates that brand oriented SMEs use internal and external branding capabilities differently across institutional contexts. Ghasempour Ganji and Kazemi (2024) connect brand orientation, marketing capabilities, customer value cocreation and international brand performance. Huang et al. (2025) further

show that digital orientation contributes to business brand equity through brand exploitation and exploration. Across these studies, orientation is not self executing. It becomes productive through coordinated capabilities that convert identity into action.

The present study moves one stage upstream. It asks what enables a firm to install and use the digital infrastructure through which a promise can later be evidenced. This move matters because branding research can overprivilege visible communication while treating fulfilment as a background assumption. In practice, the experience of reliability or transparency originates in production schedules, data architecture, supplier coordination and decision rights. A capability-based branding account should therefore examine not only how meaning is expressed, but also how the organisation becomes able to perform that meaning repeatedly.

2.2 Dynamic capabilities as brand delivery infrastructure

Dynamic capabilities theory explains how firms sense opportunities and threats, seize selected opportunities and transform their resource base as conditions change (Teece et al., 1997; Teece, 2007). The framework is relevant to branding because brands require continuity and adaptation at the same time. Identity must remain recognisable, yet delivery systems must respond to new technologies, customer expectations and competitive moves. Brand orientation supplies a criterion for coherent change, while dynamic capabilities supply the mechanisms through which change becomes possible.

Technological capability and strategic flexibility occupy distinct positions in this process. Technological capability concerns the knowledge, skills and routines required to acquire, integrate, operate and improve technology. It determines whether data can move across systems and whether employees can convert equipment into useful work. Strategic flexibility concerns the firm's capacity to identify alternatives, revise commitments and reallocate resources with acceptable speed and cost (Zhou and Wu, 2010). A firm may possess strong technical knowledge yet remain locked into a rigid plan. Another may be willing to adapt but lack the technical competence to evaluate options. Reliable digital brand delivery requires both.

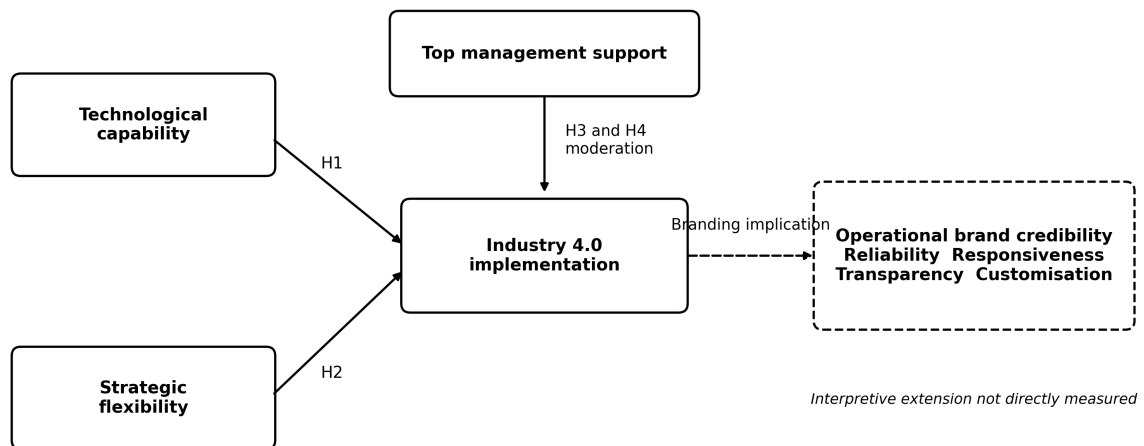
Recent digital transformation studies reinforce this distinction. Malodia et al. (2023) show that professional leadership and owner related digital self efficacy shape different transformation journeys in SMEs. Saeedikiya et al. (2024) position dynamic capabilities as central to digital transformation in the mobility sector. Gyamerah et al. (2025) connect leadership, digital capability and digital strategy in SMEs, while Hafeez et al. (2025) show how innovation intermediaries can contribute dynamic capabilities within ecosystems. Romero and Mammadov (2025) find that internal skills, external knowledge, explicit strategy and distributed responsibility jointly determine digital innovation in SMEs. Escob Barragan and Becker (2025) report that the relationship between digital orientation and performance is not uniformly linear, which cautions against equating greater technological emphasis with immediate value. These findings justify analysing capabilities, flexibility and leadership as a configuration rather than as interchangeable resources.

For branding, the configuration operates through a chain of substantiation. Identity defines the association the firm seeks to own. Technological capability makes relevant data and processes available. Strategic flexibility allows the firm to reconfigure those resources as customer needs

or operating conditions change. Industry 4.0 implementation embeds the configuration in routines. Customers then encounter evidence from which reliability, innovation or trust may be inferred. The survey observes the middle of this chain. Figure 1 separates the tested implementation model from the subsequent branding implication so that theoretical extension does not become measurement overreach.

Figure 1

Conceptual model and branding interpretation



Note. Solid paths represent the tested implementation model. The dashed path represents the branding interpretation and was not directly measured.

Table 1

Construct roles and disciplined branding interpretation

Construct	Measured role	Branding relevance	Not claimed
Technological capability	Ability to acquire, integrate, use and improve technology	Creates reliable operating evidence for selected brand promises	Brand equity or customer trust
Strategic flexibility	Ability to revise commitments and reallocate resources	Allows delivery methods to adapt while identity remains coherent	Brand personality or market orientation
Top management support	Leadership resources, attention and direction	Provides brand guardrails and implementation governance	Effective leadership quality in every circumstance

Construct	Measured role	Branding relevance	Not claimed
Industry 4.0 implementation	Use of connected digital production and operating technologies	Potential infrastructure for reliability, transparency, responsiveness and customisation	A direct measure of branding or customer response

Note. Branding relevance is a theory-based interpretation. Customer based brand outcomes were not included in the survey.

2.3 Ghanaian SMEs as a theoretically informative context

Emerging economy SMEs face a double constraint. They must respond to the same digital expectations that affect larger firms, yet they frequently operate with less specialised labour, weaker infrastructure and more restricted finance. Ghanaian enterprises also work across formal and informal market arrangements, making reputation and personal relationships important coordination devices. These conditions do not merely make implementation harder. They increase the branding cost of inconsistency because customers may interpret operational failure as evidence about the integrity of the business and its owner.

The context also sharpens the leadership question. In a founder led SME, senior management may control investment, supplier selection, customer exceptions and employee discretion. Such concentration can align a brand quickly around a clear entrepreneurial vision. It can also make brand delivery person dependent. As the enterprise digitises, the owner may continue to approve decisions that the new information system was intended to decentralise. The result is a paradox in which technology expands the firm's reach while governance restricts its capacity to respond.

Anabila et al. (2024) provide relevant Ghanaian evidence by showing that trust mediates the relationship between ecommerce adoption and performance and that agility acts as a boundary condition. The finding supports a broader inference: value arises when digital access, trustworthy delivery and adaptive response work together. The present study examines a related internal configuration before those market outcomes occur. Ghana is therefore not treated as a convenient setting for testing a universal technology model. It is a context in which operational capability, trust and concentrated authority are theoretically intertwined.

2.4 Technological capability and implementation

Industry 4.0 implementation requires selection, integration, learning and maintenance. SMEs must evaluate vendors, connect new and legacy systems, maintain data quality and translate technical outputs into operating decisions. Technological capability reduces the uncertainty and coordination cost associated with these activities. Frank et al. (2019) show that implementation patterns vary with organisational conditions, while Chiarini et al. (2020) emphasise the strategic and technological adjustments required in manufacturing. Sony et al. (2022) similarly identify technological capability as central to successful implementation.

The capability is brand relevant because it governs whether external claims can be substantiated. A transparency promise requires reliable records. A responsiveness promise requires integrated information and timely action. A consistency promise requires systems that detect and correct variation. Customers need not see the underlying capability to evaluate its consequences. Technological capability is thus a backstage resource that produces frontstage evidence. The expected relationship concerns implementation, not brand equity, but implementation creates the infrastructure through which credibility can later be earned.

H1: Technological capability has a positive association with Industry 4.0 implementation.

2.5 Strategic flexibility and implementation

Implementation changes interdependence among equipment, employees, suppliers and customers. Early assumptions may prove wrong and new information may require the firm to revise sequencing, vendors or resource commitments. Strategic flexibility permits such adjustment without converting every change into organisational crisis. Miroshnychenko et al. (2021) show that flexibility helps SMEs convert absorptive capacity into business model innovation. Zhou and Wu (2010) demonstrate that flexibility conditions how technological capability contributes to innovation. These arguments imply that flexible firms should be better able to move from pilot technologies to routines.

Brand management adds a criterion to flexibility. Adaptation is valuable when it changes the means while protecting the intended meaning. A reliability brand may change its scheduling system but retain on time fulfilment as the governing outcome. A customer intimacy brand may automate routine contacts while preserving human escalation for complex needs. Strategic flexibility therefore protects a brand from both rigidity and incoherence. It allows the delivery system to evolve without making the promise unstable.

H2: Strategic flexibility has a positive association with Industry 4.0 implementation.

2.6 The contingent role of top management support

Top management support normally provides resources, legitimacy and conflict resolution for technology initiatives (Hsu et al., 2018). In SMEs, senior leaders also act as brand stewards because their values and behaviour frequently define the enterprise. Support can connect implementation priorities with market positioning, protect learning time and ensure that technology choices serve a coherent customer promise. On this basis, stronger support should increase the capacity of technological capability and strategic flexibility to produce implementation.

Yet support is not equivalent to effective governance. Intensive intervention can add approval layers, impose preferred solutions and discourage specialist disagreement. Malodia et al. (2023) show why professional leadership must be distinguished from owner centred confidence. Romero and Mammadov (2025) similarly emphasise responsibility distributed beyond the entrepreneur. When leaders substitute personal judgement for technical routines, capability remains present but its marginal contribution declines. When they change priorities frequently, flexibility becomes reactive rather than strategic.

The branding consequence is significant. A founder may protect a coherent identity while simultaneously becoming the bottleneck that prevents consistent delivery at scale. This possibility makes the moderation tests analytically useful even though the original hypotheses expect strengthening. The tests evaluate whether leadership complements dispersed capabilities. A negative result would instead indicate substitution, crowding or governance friction and would require interpretation rather than cosmetic support claims.

H3: Top management support positively moderates the association between technological capability and Industry 4.0 implementation.

H4: Top management support positively moderates the association between strategic flexibility and Industry 4.0 implementation.

3. METHODS

3.1 Research design and sample

The study used a quantitative cross-sectional design. Data were collected online between August and October 2025 from owners and managers of SMEs in Accra and Kumasi. These metropolitan areas were selected because they contain dense concentrations of commercial activity and offered access to firms at different stages of digital implementation. A complete sampling frame of SMEs implementing Industry 4.0 was not available. Initial access therefore used convenience sampling and eligibility was subsequently established through purposive screening.

Four hundred questionnaires were distributed. Firms that had not begun implementing relevant technologies were excluded, leaving 343 usable responses. The enterprise was the unit of analysis and an owner or manager acted as key informant. Participants received an explanation of the study and assurances of confidentiality and anonymity. The questionnaire was kept concise, reminders were issued and potentially ambiguous technical terms were clarified. These measures reduce avoidable response error and are consistent with procedural recommendations for limiting common method bias (Podsakoff et al., 2003). They do not eliminate the limitations of a single informant design.

The sampling choices were pragmatic and appropriate for locating an uncommon target population, but they constrain inference. The results describe associations among participating firms rather than prevalence estimates for all Ghanaian SMEs. The metropolitan focus may also underrepresent rural firms and enterprises facing more severe infrastructure limitations. These boundaries are retained in the interpretation instead of being concealed by the size of the final sample.

3.2 Measurement

All constructs used multi-item measures with five-point Likert response formats. Technological capability was adapted from Sobanke et al. (2014), strategic flexibility from Zhou and Wu (2010), top management support from Hsu et al. (2018) and Liu et al. (2020) and Industry 4.0 implementation from Chiarini et al. (2020). The final measurement model retained four technological capability indicators, two strategic flexibility indicators, two top

management support indicators and five implementation indicators following the original item screening process.

Construct labels were not changed for the branding reinterpretation. None of the items directly measures brand awareness, brand associations, perceived authenticity, trust or brand equity. Industry 4.0 implementation is consequently treated as a potential operational antecedent of credible brand delivery. Table 1 makes this distinction explicit by separating the measured role of each construct from its branding relevance and from customer outcomes that remain outside the data. This approach strengthens construct validity and creates testable propositions for subsequent research.

3.3 Analytical procedure

The measurement and structural models were estimated in SmartPLS4 with partial least squares structural equation modelling. The approach is suitable for prediction-oriented models and does not require multivariate normality, although it does require theoretical discipline and careful measurement assessment (Hair et al., 2022). A two-stage procedure first examined indicator loadings, internal consistency, convergent validity and discriminant validity. The second stage evaluated explanatory power, effect sizes and structural paths. Bootstrapping with 5,000 resamples generated standard errors, test statistics and probability values.

Cronbach's alpha and composite reliability assessed internal consistency. Indicator loadings and average variance extracted assessed convergence. The Fornell and Larcker (1981) criterion assessed discriminant validity and indicator variance inflation factors assessed collinearity (Roemer et al., 2021). Structural evaluation used coefficients, effect sizes, explained variance and the standardised root mean square residual. The residual statistic is treated as a diagnostic rather than a certificate of global fit.

4. RESULTS

4.1 Measurement model

Table 2 reports the retained indicators. Loadings range from .717 to .892 and each average variance extracted value exceeds .50. Composite reliability ranges from .855 to .869. Alpha is .801 for implementation and .800 for technological capability. The two-item strategic flexibility and top management support measures have alpha values of .662 and .689. Their composite reliability is acceptable, but the shorter scales provide limited content coverage and should be interpreted more cautiously than the four and five item measures.

The diagonal elements in Table 3 are the square roots of average variance extracted. Each exceeds the corresponding correlations in its row and column, satisfying the reported Fornell Larcker assessment. The closest comparison is between implementation and technological capability. The margin is adequate but not large, which is conceptually plausible because technologically capable firms are more likely to implement the technologies. Indicator variance inflation factors range from 1.325 to 2.070 and do not indicate problematic indicator collinearity.

Thus, the results provide a satisfactory basis for evaluating the structural relationships.

Table 2*Indicator reliability and convergent validity*

Construct	Item	Weight	Loading	VIF	α	CR	AVE
Industry 4.0 implementation	I2	.263	.719	1.558	.801	.862	.557
	I3	.254	.757	1.689			
	I4	.293	.717	1.538			
	I5	.240	.725	1.730			
	I6	.290	.809	2.070			
Strategic flexibility	SF3	.611	.881	1.325	.662	.855	.747
	SF4	.545	.848	1.325			
Technological capability	TC1	.330	.771	1.555	.800	.869	.625
	TC7	.313	.821	1.892			
	TC8	.335	.793	1.597			
	TC9	.288	.775	1.744			
Top management support	TMS5	.613	.892	1.382	.689	.865	.762
	TMS6	.532	.854	1.382			

Note. VIF = variance inflation factor. CR = composite reliability. AVE = average variance extracted.

Table 3*Discriminant validity using the Fornell Larcker criterion*

Construct	I4.0	SF	TC	TMS
Industry 4.0 implementation	.746			
Strategic flexibility	.664	.864		
Technological capability	.718	.536	.790	
Top management support	.671	.560	.459	.873

Note. Diagonal values are the square roots of average variance extracted. Off diagonal values are construct correlations.

4.2 Structural model

The model explains .763 of the variance in Industry 4.0 implementation, with adjusted explained variance of .759. Technological capability has the largest focal effect size, followed by the strategic flexibility interaction, strategic flexibility, top management support and the technological capability interaction. The standardised root mean square residual is .106. The explained variance indicates strong explanatory power within the observed sample, while the residual statistic suggests that future models can capture additional structure.

Table 5 shows that technological capability has a positive association with implementation, supporting H1. Strategic flexibility also has a positive association, supporting H2. Top management support has a positive direct association although no separate direct effect hypothesis was proposed. Both interaction coefficients are negative. Top management support therefore weakens, rather than strengthens, the marginal association of technological capability and strategic flexibility with implementation. H3 and H4 are not supported.

The distinction between a positive conditional slope and positive moderation is essential. A capability may remain positively associated with implementation at high levels of management support while its slope is flatter than the corresponding slope at low support. That pattern is still negative moderation. Figure 2 presents the final model in black and white and Table 5 preserves the reported estimates.

Table 4

Structural model summary and effect sizes

Statistic or predictor	Value	Interpretation
Explained variance for implementation	$R^2 = .763$	Substantial explanatory power within the observed sample
Adjusted explained variance	.759	Limited shrinkage after adjustment
Standardised root mean square residual	.106	Opportunity for model refinement
Technological capability	$f^2 = .223$	Largest focal contribution
Strategic flexibility	$f^2 = .092$	Small contribution
Top management support	$f^2 = .043$	Small contribution
TC $\times$ TMS	$f^2 = .022$	Small interaction contribution
SF $\times$ TMS	$f^2 = .130$	Approaches a medium interaction contribution

Note. Effect sizes and model statistics reproduce the available source output. TC = technological capability. SF = strategic flexibility. TMS = top management support.

Table 5

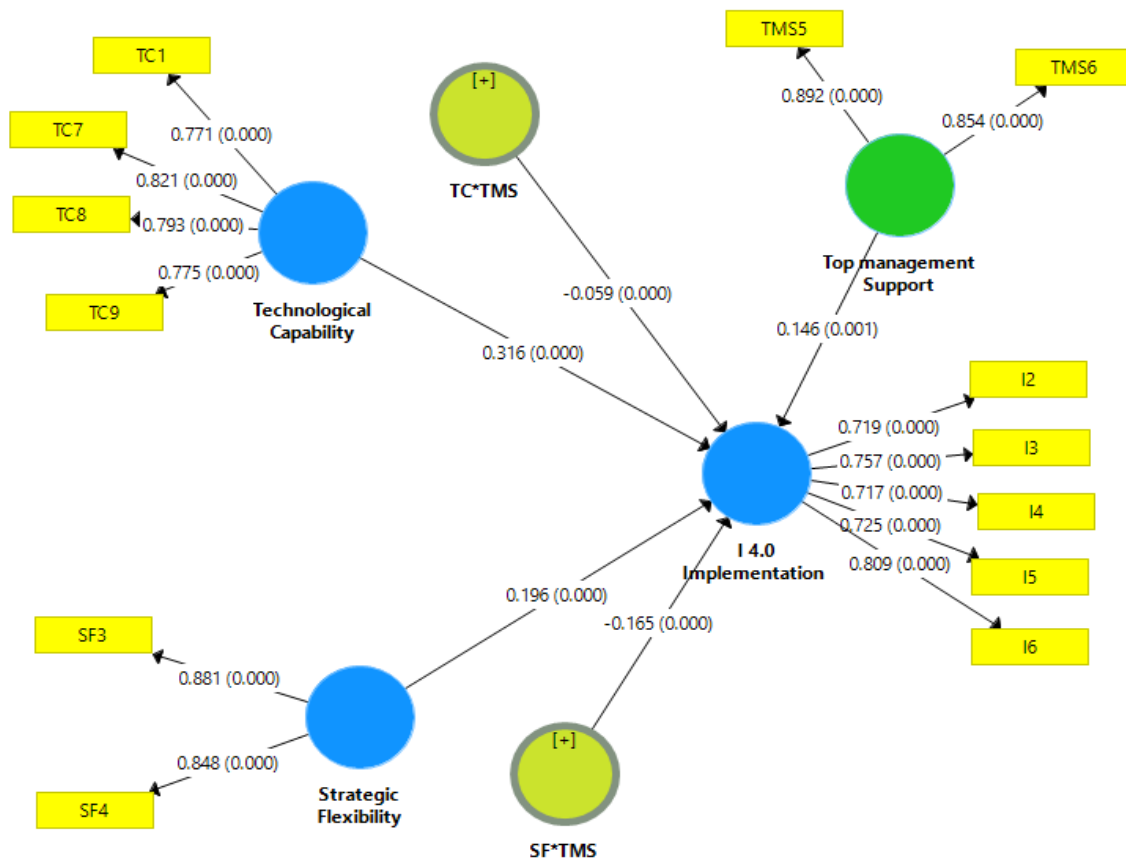
Structural paths and hypothesis decisions

Path	β	Mean	SE	t	p	Decision
TC $\rightarrow$ I4.0	.316	.321	.043	7.416	< .001	H1 supported
SF $\rightarrow$ I4.0	.196	.195	.033	5.938	< .001	H2 supported
TMS $\rightarrow$ I4.0	.146	Not reported	Not reported	Not reported	.001	Direct path positive
TC $\times$ TMS $\rightarrow$ I4.0	-.165	-.163	.024	6.861	< .001	H3 not supported
SF $\times$ TMS $\rightarrow$ I4.0	-.059	-.059	.013	4.648	< .001	H4 not supported

Note. Reported estimates are reproduced without alteration. A negative interaction indicates attenuation, not positive moderation.

Figure 2

Final structural model



Note. All coefficients are standardised. The direct path from top management support was reported but not separately hypothesised.

5. DISCUSSION

5.1 Technological capability as brand substantiation

The technological capability result indicates that implementation depends on more than access to equipment or software. Firms need the knowledge to select, connect, use and improve technology. This finding is consistent with Sony et al. (2022) and with recent research that treats digital transformation as an organisational innovation process rather than procurement (Romero and Mammadov, 2025). It also complements Escobarran and Becker (2025), whose curvilinear evidence warns that digital orientation can impose costs before capabilities mature.

The branding contribution is the concept of substantiation. Marketing communication makes a claim available, but technological capability helps make the claim verifiable. For a brand positioned on dependability, integrated production and inventory data can reduce missed commitments. For a transparency position, traceability can supply credible provenance information. For a responsive brand, analytics and connected workflows can shorten detection and recovery. The technology itself does not create the association. It creates evidence that customers and partners can interpret as confirmation of the promise.

This perspective corrects two symmetrical errors. The first is technological determinism, which assumes that installing advanced systems automatically produces a modern brand. The second is communications reductionism, which treats branding as separate from operations. The results support neither. Capability matters because it makes implementation possible, while brand value depends on selecting uses that are relevant to identity and customer judgement. The strategic task is alignment rather than maximal adoption.

5.2 Strategic flexibility as disciplined brand adaptation

Strategic flexibility also contributes to implementation. This finding accords with dynamic capabilities reasoning and with evidence linking flexibility to innovation in SMEs (Miroshnychenko et al., 2021). Implementation projects reveal uncertainty that cannot be resolved at the planning stage. Flexible firms can revise commitments, reassign resources and learn from small failures. This capacity is valuable in Ghanaian SMEs because scarce capital makes large irreversible mistakes particularly costly. For brand management, flexibility should be disciplined by identity. A strong brand is neither an inflexible script nor an unrestricted willingness to change. It is a stable promise supported by adaptable means. Leaders must identify which customer outcomes are non negotiable and which processes may be redesigned. This distinction allows an enterprise to preserve reliability while changing suppliers, or preserve personal service while automating routine information requests. Flexibility then protects coherence instead of weakening it.

Huang et al. (2025) describe brand exploitation and exploration as pathways from digital orientation to business brand equity. The present result provides an operational complement. Strategic flexibility helps the firm move between exploiting established delivery routines and exploring alternative technologies or workflows. It therefore contributes to the organisational ambidexterity behind a credible digital brand, even though customer brand equity remains outside the tested model.

5.3 Why management support attenuates capability effects

The two negative interactions are the most theoretically informative results. They show that support has a positive average association with implementation while reducing the marginal contribution of technological capability and strategic flexibility. Direct and interaction effects answer different questions. The direct path indicates that leadership resources are generally useful. The negative interactions indicate that those resources do not combine with the focal capabilities in the hypothesised complementary manner.

A substitution explanation is plausible. When top management provides budgets, authority and coordination, some of the implementation work that would otherwise depend on dispersed capability is supplied centrally. The incremental effect of employee or unit capability then becomes smaller. This is not necessarily harmful, but it suggests overlapping routes to implementation. The pattern may be especially likely in small firms where the owner can mobilise resources quickly and personally resolve cross functional conflict.

A governance friction explanation is also plausible. Strong involvement may become frequent intervention, priority changes or approval dependency. Technical specialists may have capability but less discretion to use it. Strategically flexible units may identify alternatives but wait for executive permission. The larger negative coefficient for the technological capability interaction is consistent with the possibility that specialist judgement is especially vulnerable to override. The cross-sectional data cannot determine which mechanism dominates, so both should remain as theoretically grounded explanations for future qualitative testing.

Branding makes the governance risk visible. Founder led brands often benefit from a clear personal identity, yet the same centrality can make the promise impossible to scale. If every exception or process change requires the founder, responsiveness is a personal service rather than an organisational capability. The brand may communicate agility while operating through a bottleneck. Effective brand stewardship therefore requires leaders to define meaning and guardrails while allowing qualified employees to determine how the promise is delivered.

5.4 Theoretical contributions

First, the study advances an operational brand credibility perspective. Existing SME branding research maps orientation, identity, marketing and performance (Fluhrer and Brahm, 2026). The present study specifies an implementation layer between identity and market experience. This layer explains why similar communications can produce different levels of trust. Firms differ in their capacity to generate consistent operational evidence.

The study also connects brand orientation with dynamic capabilities while preserving their distinct functions. Brand orientation determines what the organisation seeks to mean. Dynamic

capabilities explain how resources are built and reconfigured so that meaning can be enacted as conditions change. Technological capability creates usable options, strategic flexibility permits disciplined movement among them and implementation embeds selected options in routines. This division of theoretical labour is more precise than calling branding itself a dynamic capability.

Moreover, the results recast top management support as a governance variable. SME research commonly treats senior support as a resource that should intensify other positive relationships. The interaction results show why level and combination effects must be separated. Leadership can move implementation forward while simultaneously making existing capabilities less consequential. Branding scholarship benefits from this distinction because owner centrality shapes both identity coherence and delivery scalability.

Again, the Ghanaian setting extends digital branding research beyond platform rich environments. Where infrastructure, finance and specialised skills are constrained, credibility may depend less on spectacular technology than on selective systems that make a modest promise consistently true. The context therefore reveals a principle with wider relevance: credible digital branding is achieved through coherent capability configurations, not through symbolic association with advanced technology.

5.5 Managerial and policy implications

Managers should begin with a brand delivery map. For each priority association, they should specify the customer evidence required, the process that produces it, the data on which the process depends and the person with decision authority. A predictive maintenance system becomes brand relevant when it protects promised availability. A customer portal becomes brand relevant when its information is accurate and useful. Technology proposals that cannot be connected to a valued promise should receive lower priority regardless of novelty.

Technological capability should be built as a portfolio of skills and routines. Procurement should include employee training, data governance, vendor knowledge transfer, maintenance plans and interoperability. A low-cost pilot should be assessed with operational measures and customer visible evidence. Managers should ask whether the pilot improves the proof of the intended promise, not merely whether the system functions. This approach reduces dependence on vendors and makes digital investment easier to defend under financial constraint.

Strategic flexibility should be designed rather than assumed. Modular projects, staged commitments, scenario planning and explicit exit criteria allow learning without turning every adjustment into strategic confusion. Brand guardrails should identify outcomes that must remain stable, such as response time, quality tolerance or traceability. Teams may then change tools and workflows while protecting the experience customers recognise.

Leadership should move from permission-based control to enabling governance. Senior managers should articulate brand meaning, allocate resources, define ethical limits and review outcome evidence. Technical sequencing and routine adaptation should be delegated within clear thresholds. A small cross functional brand delivery group can connect marketing, operations, technology and customer service. Written decision rights reduce delay and make the promise less dependent on the presence of the owner.

Enterprise support institutions should integrate digitalisation and branding assistance. Technology programmes often count adoption while branding programmes emphasise identity and communication. Ghanaian SMEs would benefit from diagnostics that connect a market promise with the capabilities required to deliver it. Shared specialists, vendor neutral advice and peer learning can help firms choose attainable systems. Support should reward credible use and capability transfer rather than visible acquisition alone.

Table 6

Brand delivery governance for Ghanaian SMEs

Brand promise	Operational proof	Capability priority	Governance question
Reliability	Stable specifications and dependable fulfilment	Integrated process data and maintenance routines	Who may act before a failure reaches the customer?
Responsiveness	Fast detection, answer and recovery	Shared information and flexible decision rights	Which decisions can frontline specialists make?
Transparency	Accurate status and provenance information	Data quality, traceability and access control	What evidence is useful, accurate and ethically shareable?
Customisation	Controlled variation without quality loss	Modular processes and adaptive resource allocation	Which brand standards remain non negotiable?
Innovation	Useful improvement customers can experience	Experimentation, learning and vendor knowledge transfer	Does novelty strengthen the intended meaning?

Note. The table translates the empirical capability configuration into branding decisions. It does not add measured outcomes.

6. LIMITATIONS AND FUTURE RESEARCH

The study offers a focused account of the organisational foundation of digital brand credibility. Its measures capture the capabilities and implementation systems through which a promise can be performed, while customer responses sit at the next stage of the proposed brand credibility chain. Future research can extend this foundation by connecting brand orientation, technological capability, strategic flexibility and implementation with customer trust and brand equity. Matched evidence from managers, employees and customers would provide a particularly valuable test of how operational proof becomes market meaning.

The cross-sectional design captures a clear view of the capability configuration at one point in the transformation journey. Longitudinal studies can build on it by following technology projects from selection through routinisation and customer response. Replication across

additional Ghanaian regions, informal enterprises and sector specific groups would also reveal where the observed relationships are strongest and would deepen understanding of the diversity within the national SME landscape.

The negative interactions create a promising research agenda. Interviews and comparative cases could distinguish capability substitution, intensive intervention, symbolic sponsorship and effective delegation. Research on decision rights, founder centrality and technical expertise would explain when leadership protects brand coherence and when distributed authority improves delivery. Experimental studies could then examine how customers interpret different forms of operational proof, while longitudinal brand tracking could establish how reliability, transparency and responsiveness accumulate into trust and brand equity.

7. CONCLUSION

Digital brand credibility begins inside the organisation. Among the Ghanaian SMEs studied, technological capability and strategic flexibility are positively associated with Industry 4.0 implementation. These capabilities help firms create integrated and adaptable operating systems from which customers may later infer reliability, responsiveness, transparency or innovation. Top management support contributes directly to implementation, but it attenuates the marginal effects of both capabilities. The result shifts attention from whether leaders support transformation to how their support is governed.

The strongest branding implication is straightforward. Communication can announce a promise, but only organisational capability can make the promise repeatedly true. Ghanaian SMEs should therefore treat technology investment, adaptive routines and decision rights as elements of brand management. Leaders create scalable brands when they define a coherent meaning, invest in the capabilities that substantiate it and distribute enough authority for the organisation to perform without continuous personal intervention.

8. REFERENCES

- Anabila, P., Kumi, D. K., Ameyibor, L. E. K., & Allan, M. M. (2024). E-commerce adoption among entrepreneurial firms in Sub-Saharan Africa. *Journal of Small Business and Enterprise Development*, 31(7), 1400–1423. <https://doi.org/10.1108/JSBED-08-2023-0358>
- Chiarini, A., Belvedere, V., & Grando, A. (2020). Industry 4.0 strategies and technological developments: Exploratory research from Italian manufacturing companies. *Production Planning & Control*, 31(16), 1385–1398. <https://doi.org/10.1080/09537287.2019.1695924>
- Escob Barragan, K., & Becker, F. S. R. (2025). Keeping pace with the digital transformation: Exploring the digital orientation of SMEs. *Small Business Economics*, 64(3), 1361–1385. <https://doi.org/10.1007/s11187-024-00947-7>

- Fluhrer, P., & Brahm, T. (2026). How small businesses build their brands in a digital world: A systematic review. *Review of Managerial Science*, 20(6), 1965–2000. <https://doi.org/10.1007/s11846-025-00931-9>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.1177/002224378101800104>
- Frank, A. G., Dalenogare, L. S., & Ayala, N. F. (2019). Industry 4.0 technologies: Implementation patterns in manufacturing companies. *International Journal of Production Economics*, 210, 15–26. <https://doi.org/10.1016/j.ijpe.2019.01.004>
- Ghasempour Ganji, S. F., & Kazemi, A. (2024). Improving international brand performance: The implications of marketing capabilities, brand orientation and customer value cocreation. *Journal of Product & Brand Management*, 33(8), 1088–1100. <https://doi.org/10.1108/JPBM-03-2023-4399>
- Gyamerah, S., Afshari, L., & Asante, D. (2025). Digital transformation in the SME context: The nexus between leadership, digital capabilities and digital strategy. *International Small Business Journal: Researching Entrepreneurship*, 43(3), 303–328. <https://doi.org/10.1177/02662426251314108>
- Hafeez, S., Shahzad, K., & De Silva, M. (2025). Enhancing digital transformation in SMEs: The dynamic capabilities of innovation intermediaries within ecosystems. *Long Range Planning*, 58(3), Article 102525. <https://doi.org/10.1016/j.lrp.2025.102525>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage.
- Hsu, H. Y., Liu, F. H., Tsou, H. T., & Chen, L. J. (2019). Openness of technology adoption, top management support and service innovation: A social innovation perspective. *Journal of Business & Industrial Marketing*, 34(3), 575–590. <https://doi.org/10.1108/JPBM-03-2017-0068>
- Huang, L., Xiang, L., & Wu, C. (2025). Exploring the pathway of improving B2B brand equity in digital era: Integrating digital orientation to brand ambidexterity. *Journal of Product & Brand Management*, 34(7), 1008–1022. <https://doi.org/10.1108/JPBM-05-2024-5192>
- Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing*, 57(1), 1–22. <https://doi.org/10.1177/002224299305700101>
- Kusi, S. Y., Gabrielsson, P., & Baumgarth, C. (2022). How classical and entrepreneurial brand management increases the performance of internationalising SMEs? *Journal of World Business*, 57(5), Article 101311. <https://doi.org/10.1016/j.jwb.2022.101311>

- Liu, J., Liu, Y., & Yang, L. (2020). Uncovering the influence mechanism between top management support and green procurement: The effect of green training. *Journal of Cleaner Production*, 251, Article 119674. <https://doi.org/10.1016/j.jclepro.2019.119674>
- Malodia, S., Mishra, M., Fait, M., Papa, A., & Dezi, L. (2023). To digit or to head? Designing digital transformation journey of SMEs among digital self-efficacy and professional leadership. *Journal of Business Research*, 157, Article 113547. <https://doi.org/10.1016/j.jbusres.2022.113547>
- Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, 123, 642–656. <https://doi.org/10.1016/j.jbusres.2020.10.033>
- Miroshnychenko, I., Strobl, A., Matzler, K., & De Massis, A. (2021). Absorptive capacity, strategic flexibility, and business model innovation: Empirical evidence from Italian SMEs. *Journal of Business Research*, 130, 670–682. <https://doi.org/10.1016/j.jbusres.2020.02.015>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Ranjan, P. (2024). Different countries, different institutions: How do brand-oriented SMEs leverage branding capabilities to boost export performance? *International Marketing Review*, 41(2), 562–589. <https://doi.org/10.1108/IMR-08-2023-0207>
- Roemer, E., Schubert, F., & Henseler, J. (2021). HTMT2: An improved criterion for assessing discriminant validity in structural equation modeling. *Industrial Management & Data Systems*, 121(12), 2637–2650. <https://doi.org/10.1108/IMDS-02-2021-0082>
- Romero, I., & Mammadov, H. (2025). Digital transformation of small and medium-sized enterprises as an innovation process: A holistic study of its determinants. *Journal of the Knowledge Economy*, 16(2), 8496–8523. <https://doi.org/10.1007/s13132-024-02217-z>
- Saeedikiya, M., Salunke, S., & Kowalkiewicz, M. (2024). Toward a dynamic capability perspective of digital transformation in SMEs: A study of the mobility sector. *Journal of Cleaner Production*, 439, Article 140718. <https://doi.org/10.1016/j.jclepro.2024.140718>
- Sobanke, V., Adegbite, S., Ilori, M., & Egbetokun, A. (2014). Determinants of technological capability of firms in a developing country. *Procedia Engineering*, 69, 991–1000. <https://doi.org/10.1016/j.proeng.2014.03.081>
- Sony, M., Antony, J., & Mc Dermott, O. (2023). How do the technological capability and strategic flexibility of an organization impact its successful implementation of Industry

4.0? A qualitative viewpoint. *Benchmarking: An International Journal*, 30(3), 924–949.
<https://doi.org/10.1108/BIJ-09-2021-0541>

Spilotro, C., Secundo, G., & Del Vecchio, P. (2025). Discovering the impact of emerging technologies on SMEs' digital marketing strategies: A conceptual framework. *International Marketing Review*, 42(4), 666–697. <https://doi.org/10.1108/IMR-11-2023-0301>

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of sustainable enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350.
<https://doi.org/10.1002/smj.640>

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
[https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7<509::AID-SMJ882>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z)

Urde, M. (1999). Brand orientation: A mindset for building brands into strategic resources. *Journal of Marketing Management*, 15(1–3), 117–133.
<https://doi.org/10.1362/026725799784870504>

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901.
<https://doi.org/10.1016/j.jbusres.2019.09.022>

Wong, H. Y., & Merrilees, B. (2005). A brand orientation typology for SMEs: A case research approach. *Journal of Product & Brand Management*, 14(3), 155–162.
<https://doi.org/10.1108/10610420510601021>

Zhou, K. Z., & Wu, F. (2010). Technological capability, strategic flexibility, and product innovation. *Strategic Management Journal*, 31(5), 547–561.
<https://doi.org/10.1002/smj.830>