What Drives Digital Marketing Adoption in Resource-Constrained MSMEs? Evidence Using a TOE-Led Integrative Framework

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ABSTRACT

This study examines how technology, organization, and environmental factors influence MSME intention and digital-marketing adoption. Based on TOE, TAM, and DOI models of adoption and estimated using CB-SEM on a cross-sectional survey using validated scales, the results find intention as the dominant pathway to adoption. Intention rises with perceived ease of use, compatibility/capabilities, relative advantage, trust, knowledge, and customer/competitive pressure, and falls with perceived financial cost; strategic—but not tactical—digital-marketing orientation contributes incremental explanation. Tests of mediation find that most antecedents impact adoption via intention. The results position ease-of-use and skill-training centre-stage, trust-building and capability-building, and selective cost relief as means of converting intention into use and offer district-level guidance for policymakers and incubators, and encouragement for future longitudinal follow-up.

Keywords: Digital Marketing Adoption, MSMEs, Rural Enterprises, Technology-Organization-Environment Framework, TAM, DOI, Intention-Behavior Link
JEL Classifications: M3,O3

1. INTRODUCTION

India's economy is rushing toward digital business. Established large business houses are already benefiting from search, social media, mobile, and data-based advertising. For Micro, Small, and Medium Enterprises (MSMEs), digital marketing offers the promise of cost reduction, expanded reach, and measurable outcomes. But even then, digital marketing adoption of MSMEs is uneven between cities and rural spaces. Many of these rural-based MSMEs still suffer from poor Internet connectivity, limited digital marketing service providers, and limited expertise. Averages at the national or state level obscure these differences. A rural perspective/lens is needed to identify what hampers or enables adoption on the ground.

A rural lens matters because MSME ecosystems are local and path-dependent. Strong Internet, expert intermediaries, and peer learning also cluster in towns and scatter thinly over neighboring villages. Government support—with common service centers, clusters, skilling, and digital literacy—is also offered locally, and results hinge on the final ultimate last-mile capacity. Diffusion acts similarly, by acting more quickly in incredibly concentrated urban markets and stalling without locally appropriate nudges in sparse, rural territories with limited connections. Studying such rural spaces thus sheds light on why the same digital marketing tools diffuse quickly in cities but slowly in rural areas.

The paper uses Idukki (Kerala) as a model of a rural economy in deriving conclusions that can subsequently be transferred to such places. Idukki is hilly and predominantly rural, with decentralized settlements and distance-based movement. The regional economy is a mixture of spice cultivation, small agri-processes, and tourism—areas which significantly benefit from digital discovery, direct customer interaction, and controllability of seasonal variations. The downside is that the digital marketing

services at the last mile are broken, expert digital marketing professionals on the ground are few and far between, and training is costly to implement over distance. Kerala itself is digitally literate, but that doesn't automatically translate to digital marketing usage in interior rural blocks. The implication of the above is that the intensity and depth of digital marketing adoption among rural MSMEs remain uncertain. Additionally, the practical levers for nudging business movement from awareness to uptake diffusion, as well as how to maintain usage, are unclear.

Two of these parsimonious frictions generate a majority of the hesitation. The first is capability risk: owners resist learning whether they or their staff can perform digital content, advertising, analytics, and customer response without the pricey outside help. The second is value clarity: Firms desire certainty that digital marketing activity results in inquiries, orders, repeat business, or desirable prices. When effort appears excessive and results seem uncertain, MSMEs hesitate to invest, under-invest in breadth of suite or depth of functionality, or switch among vendors. Understanding how rural businesses generate intention and translate it into practical use is, therefore, useful and valuable.

We approach these questions using a TOE-guided integrative framework. The center is the Technology–Organization–Environment (TOE) model. Technology factors include compatibility, relative advantage, and digital marketing capabilities. Organization factors include digital marketing orientation, the CEO's knowledge, employee knowledge, and organizational readiness. Environmental factors include competitive pressure, customer power, and trust. To streamline how technology is considered and how intention is behavior, we use two classic concepts as supports, not entirely separate models. From the Technology Acceptance Model (TAM), we use Perceived Ease of Use (PEOU). If tools are perceived as easy, the intention to use them increases. From Diffusion of Innovation (DOI), we use Relative Advantage and Compatibility–if tools seem superior to traditional practices and fit current work, intention goes up. This approach keeps the model concise and focused, ensuring the strongest beliefs remain central for small firms.

We restricted ourselves to registered firms because they will provide us with verifiable data and link the results to policy levers in place. We chose to collect data from Idukki as a window on not the whole of rural India but on typical conditions of the latter: low population density, agro-tourism combination, patchy connectivity, and limited digital marketing vendors. The goal is transferability: insights that other rural places worldwide with similar features can adapt.

1.1. Research Questions
1. Which technology, organization, and environmental factors most strongly predict intention to adopt?
2. Does intention lead to actual adoption, considering rural conditions?

The paper contributes in three ways. First, rural evidence. It offers crisp, location-based findings from a hilly rural economy and outlines how such findings have implications for similar contexts.

Second, a TOE-led, TAM/DOI-informed test. It offers a lean, testable framework that keeps TOE as the general architecture but uses TAM/DOI to fill in key perceptions (ease, benefit, fit) and the intention → adoption linkage. Third, a playbook for policy and practice in the rurals. It transforms results into rural-ready interventions—short capability blasts for content, advertising, and analytics; effortless onboarding with demos and ad credits to minimize effort and showcase ROI; trust-building for platforms and vendors; and chaptered programs of associations that use competition and customer urgency at the block or panchayat level.

2. LITERATURE REVIEW

MSME digitalisation studies consistently find that adoption improves performance, but uptake and drivers vary by context and country income level (Díaz, 2024; Dimoso and Utonga, 2024). Studies in India and other emerging economies describe irregular and stepped digital marketing adoption—normally moving from basic social media use and only eventually to analytics, advertising, marketplaces, and CRM—enabled by skills, financing, supplier systems, and policy encouragement (Ahmad and Pandey, 2024; Ananda et al., 2023; Mohan, n.d.; Sahid and Hazan, 2024). To explain the adoption, studies integrate the TOE framework with the TAM and DOI framework, arguing that TOE encases structural context but TAM/DOI encode mechanism-level perceptions such as usefulness, ease, benefit, compatibility, complexity, try-and-buy, and observability at the level of route of diffusion (Hajoary et al., 2024; Herrieth and Rahim, 2023; Taherdoost et al., 2024; Triandini, 2024; Yaputri and Widuri, 2024).

To explain this, recent work integrates the TOE framework with the TAM and DOI, arguing that TOE captures structural context while TAM/DOI capture mechanism-level perceptions such as usefulness, ease, advantage, compatibility, complexity, trialability, and observability (Hajoary et al., 2024; Herrieth and Rahim, 2023; Taherdoost et al., 2024). Empirical applications often find that perceived usefulness/ease mediates the intention, and DOI attributes (e.g., trialability, observability) explain variance in perceived value and trial intentions, particularly where reliability cues matter (Triandini, 2024; Yaputri and Widuri, 2024). eviews thereby propose integrated models that keep TOE as the structural framework and utilize TAM/DOI to portray the belief formation and intention to adoption route (Herrieth and Rahim, 2023; Taherdoost et al., 2024).

In developing-country MSMEs, technology perceptions strongly forecast use and intention, but DOI/TAM impacts depend on context. Numerous studies have shown that trialability is a key predictor of adoption—those who have an opportunity to pilot platforms, test advertisements, or experience calendar content tend to continue investing, while relative advantage, compatibility, and observability tend to differ by industry and market experience (Triandini, 2024). In digital marketing alone, perceived usefulness and perceived ease of use become near proximal predictors of intention and subsequent use, as in TAM (Eze et al., 2022; Lukitaningsih et al., 2024). Complexity, however, often a barrier in resource-starved contexts, will blunt ease-of-use beliefs unless countered by support from the seller or streamlined onboarding

(Eze et al., 2022; Triandini, 2024). Cost outcomes are inconsistent: in a small number of environments, having first established capability, costs become less relevant; in a small number of others, costs remain salient as cash flow constricts and returns uncertain (Díaz, 2024; Dimoso and Utonga, 2024; Eze et al., 2022). Overall, technology literature supports a process wherein DOI attributes feed into TAM beliefs, and these in turn provide inputs to intention in the TOE-tech construct.

At the organisational level, leadership orientation, financial capability, human capital/ digital competencies, and organisational readiness consistently become important adoption antecedents (Ananda et al., 2023; Sahid and Hazan, 2024; Taherdoost et al., 2024). Start-up and MSME evidence describes how perceived usefulness can be augmented—or diffused—through internal readiness (capability, processes, budgets), and how organisational considerations intervene and engage with technology perceptions (Ananda et al., 2023; Yaputri and Widuri, 2024). Case-based and survey evidence show the role of capability building (content, ad creation, analytics, CRM) as a complement to technology availability (Ananda et al., 2023; Sahid and Hazan, 2024), while trust in platforms/vendors supports continued use where reliability and data security are concerns (Lukitaningsih et al., 2024). Hence, organizational determinants translate awareness of benefits into repeatable routines and measurable returns.

On the external side, competition pressure, customer demands, infrastructure, and policy support influence intention and realized adoption. Comprehensive models have that government support and competition significantly predict SMEs' adoption of social media marketing (Lukitaningsih et al., 2024). Systematic reviews emphasize ecosystem and policy contributions—credit access, skilling, standards, and incentives—as central in in-development-country settings (Díaz, 2024; Dimoso and Utonga, 2024; Hajoary et al., 2024). However, these environmental levers have not standardized effectiveness; they depend on accompanying last-mile infrastructure and trust-building measures to convert pressure into sustainable use (Dimoso and Utonga, 2024; Lukitaningsih et al., 2024). Availabilities of vendors and local intermediation matter, too: lean service markets block adoption even where awareness and desire abound (Ahmad and Pandey, 2024; Mohan and Ali, 2019).

When mapped into TOE, the evidence suggests:
- Technological: Trialability and relative advantage/compatibility (in context) push usefulness and ease; complexity decreases ease.
- Organizational: Readiness, skill, and leadership convert perceived usefulness/ease into lasting habits
- Environmental: Competition and policy trigger adoption, but continuation relies on infrastructure and trust.

Rural MSMEs face specific constraints that alter TOE–TAM–DOI dynamics. Cross-country evaluation indicates that IT adoption reduces the "rural penalty" on firm performance but such impact operates to varying degrees depending on local digital literacy and infrastructure (Ekeoma, 2024). Fieldwork from rural sites describes poor connectivity, scarce digital skills, cultural resistances, and inaccessibility of financing and institutional support (banks, extension services), creating high effective costs of adoption and slow diffusion (Rujitoningtyas, 2025; Willem et al., 2024). Complementary qualitative fieldwork in semi-urban sites describes skill gaps and scarce availability of inputs, noting that phased Such findings indicate that rural MSMEs benefit disproportionately from trialability mechanisms (demos, pilots), tailored training enhancing perceived ease of use, and bundled incentive/policy packages transforming environmental push into actual capability—to wit, localities modify TOE antecedents by means of TAM/DOI mechanisms (Ekeoma, 2024; Rujitoningtyas, 2025; Santi et al., 2024; Willem et al., 2024).

The literature does not reveal a single overriding determinant; impacts are diversified and frequently conditional. For example, a DOI-based PLS SEM analysis found trialability significant but other DOI dimensions insignificant for export markets of MSMEs (Triandini, 2024), Integrated TOE–TAM insights uncover usefulness and ease of use significantly dominate organizational/ environmental drivers at start-up stages (Yaputri and Widuri, 2024). Literature syntheses and large-sample syntheses confirm favorable relationships among digital adoption and SME performance but warn of contextualized reports for variations (Díaz, 2024; Dimoso and Utonga, 2024; Santi et al., 2024).

Fitting the pieces together, the evidence favours a TOE-led, TAM/DOI-informed model. In the technology domain, trialability, relative advantage, compatibility, and complexity shape usefulness and ease beliefs; these shape intention. In the organisational domain, orientation, knowledge/skills, trust, and readiness enhance the chance of perceived usefulness translating to actual use. In the environmental domain, customer and competition drivers elicit intention, and infrastructure and policy ease the translation of intention to sustained adoption. The literature on rural contexts suggests these routes are fragile in low-infrastructure, low-density locations, for which trialability and training hold the key and rewards must be packaged with intermediation to compensate for capability and trust deficits (Ekeoma, 2024; Rujitoningtyas, 2025; Santi et al., 2024; Willem et al., 2024). This synthesis directly motivates a model in which TOE supplies the backbone, and TAM/DOI constructs supply near mechanisms that detail how structural conditions translate to intentions and practices.

Despite growing interest, empirical gaps persist. Sector-/city-level work is plentiful, and few openly test TOE-led models using TAM/DOI mechanisms as nested models in the case of rurality and MSMEs (Dimoso and Utonga, 2024; Herrieth and Rahim, 2023; Santi et al., 2024). Evidence on trialability/observability and its intervention in sustaining adoption beyond metros is limited; likewise, how readiness and skills act as moderators of usefulness/ease in the case of rurality is less exercised. Reviews promote matched, multilevel designs and augmented rurality coverage in emerging markets (Díaz, 2024; Dimoso and Utonga, 2024; Herrieth and Rahim, 2023; Santi et al., 2024). Closing these gaps, the current work adopts a TOE-led integrative framework with TAM/DOI assistance and focuses on rurality and MSMEs (with Idukki-based evidence) to examine how trialability,

usefulness/ease, organizational readiness, and policy supports interact together to impact digital marketing adoption and initial performance returns. Based on the literature review, we propose the following hypothesis.

The digital marketing capabilities of MSMEs influence the performance of MSMEs, and environmental dynamism increases such a favorable influence (rapid and unexpected changes in the business environment) (Teori et al., 2022). However, do digital marketing capabilities affect the digital marketing use intention? To answer this question, we pose the following hypothesis.

H_1: There is a significant positive relationship between digital marketing capabilities and the intention to adopt digital marketing in MSMEs in Idukki district.

The degree of digital marketing orientation is primarily determined by perceived relative advantage and customer pressure (Shaltoni et al., 2018a; Shaltoni et al., 2018b). However, how digital marketing orientation affects intention to adopt is not well understood. Thus, we hypothesize that,

H_2: There is a significant positive relationship between digital marketing orientation and the intention to adopt digital marketing in MSMEs in Idukki district.

Rasheed and Nafiz (2022)found that relative advantage significantly contributes to the adoption of social media marketing, which positively affects MSME performance in the Maldives. Ali et al. (2023) concluded that relative advantage significantly determines ICT adoption intentions among Indian MSMEs and enhances firm performance. Hence, we hypothesize that,

H_3: There is a significant positive relationship between relative advantage and the intention to adopt digital marketing in MSMEs in Idukki district.

There is a positive relationship between compatibility and intention to utilize digital banking services (Wen Ni, 2020) and digital marketing (Phuong Dung et al., 2023b; Tan et al., 2024). But according to (Alzubi et al., 2018) the relationship is indirect. Hence, we hypothesize that,

H_4: There is a significant positive relationship between compatibility and the intention to adopt digital marketing in MSMEs in Idukki district.

Research suggests that perceived ease of use is significantly and positively associated with digital marketing adoption intention in India (Shanmuga Priya et al., 2021), SMEs in Kosovo (Emini and Merovci, 2021) and in Malaysia (Ashaari et al., 2025). Hence, we hypothesize that,

H_5: There is a significant positive relationship between perceived ease of use and the intention to adopt digital marketing in MSMEs in Idukki district.

Digital marketing expert trust is positively associated with digital marketing adoption intention (Buvár and Gáti, 2023). he mediating role of trust is significant for digital marketing content and digital marketing adoption intention (Ilmi et al., 2024). Hence, we hypothesize that,

H_6: There is a significant positive relationship between trust and the intention to adopt digital marketing in MSMEs in Idukki district.

More information technology (IT) knowledge accompanies more intention for digital marketing adoption (Zenebe et al., 2018). The correlation of "knowledge" and "intention to adopt digital marketing" is a significant and positive correlation, wherein a greater tendency or knowledge to use digital marketing tools translates into more intention to venture into business (Phuong Dung et al., 2023a). Hence, we hypothesize that,

H_7: There is a significant positive relationship between the CEO's knowledge and the intention to adopt digital marketing in MSMEs in Idukki district.

H_8: There is a significant positive relationship between employees' knowledge and the intention to adopt digital marketing in MSMEs in Idukki district.

Organizational readiness measures of technology readiness (TR) and financial readiness (FR) positively influenced digital marketing use intention (Giampietri and Trestini, 2020). Organizational readiness and digital marketing adoption intention have a positive link for vegetable farmers in the Philippines (Reyes et al., 2024). Hence, we hypothesize that,

H_9: There is a significant positive relationship between organizational readiness and the intention to adopt digital marketing in MSMEs in Idukki district.

Competitive pressure positively contributes to SMEs' adoption intention of social media marketing considerably, and such contribution is more in highly competitive industry groups than in low competitive industry groups (Ali Abbasi et al., 2022). Competitive pressure (i.e., market pressures) contributes positively to the digital marketing adoption intention of small and medium business entities, in congruence with organizational readiness (Su et al., 2023).

H_{10}: There is a significant positive relationship between competitive pressure and the intention to adopt digital marketing in MSMEs in Idukki district.
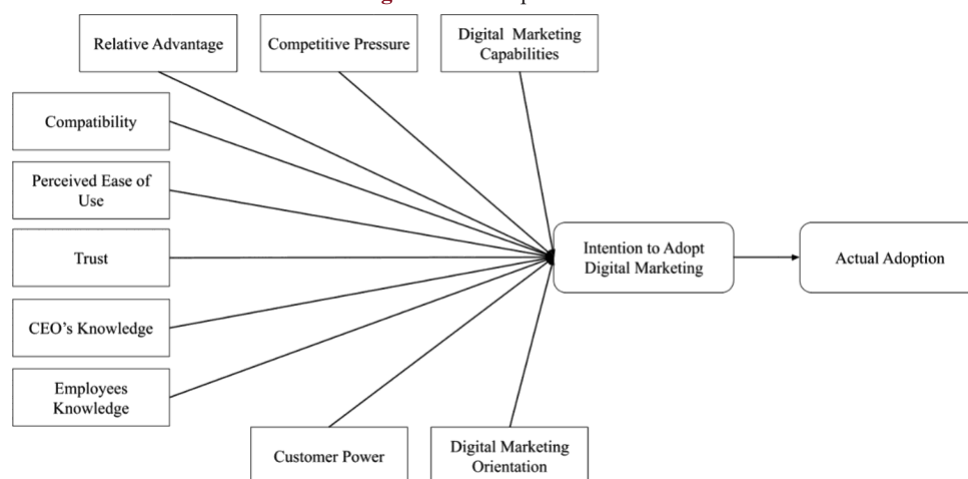
Customer pressure is strongly linked to digital marketing adoption intention (Maduku et al., 2016). There is a positive link between "customer pressure" and "intent to adopt digital marketing," such that increasing customer pressure yields a greater intention to adopt digital marketing (Sugandini et al., 2020).

H_{11}: There is a significant positive relationship between customer power and the intention to adopt digital marketing in MSMEs in Idukki district.

The relationship of adopting digital marketing with the intention of adopting digital marketing is a significant and positive one, such that having an intention to apply digital marketing enhances its adoption (Abbas and Mehmood, 2021; Phuong Dung et al., 2023b). Hence, we hypothesize that,

H_{12}: There is a significant positive relationship between the intention to adopt digital marketing and the actual adoption of digital marketing in MSMEs in Idukki district.

The conceptual model created for this study is given in Figure 1.

Figure 1: Conceptual model

Table 1: Descriptive analysis summary

Item	Summary
Sampling frame and realized sample	UDYAM-registered MSMEs in Idukki; Micro 587 (97.0%), Small 17 (2.8%), Medium 1 (0.2%).
Gender	Male 349 (57.7%), Female 256 (42.3%).
Owner age	25-35: 166 (27.4%); 36-45: 159 (26.3%); 46-55: 119 (19.7%); >55: 58 (9.6%); <25: 103 (17.0%).
Education	Undergraduate 201 (33.2%); Higher Secondary (10+2) 153 (25.3%); School-level (<10th) 85 (14.0%); Diploma 81 (13.4%); Postgraduate 45 (7.4%); No formal education 32 (5.3%); PhD 8 (1.3%).
Sector	Manufacturing 226 (37.4%); Service 176 (29.1%); Retail/Trade 155 (25.6%); Agriculture-based 48 (7.9%).
Years of operation	4-6 years: 160 (26.4%); 1-3 years: 153 (25.3%); 7-10 years: 129 (21.3%); >10 years: 86 (14.2%); <1 year: 77 (12.7%).
Employees	<10: 501 (82.8%); 10-20: 85 (14.0%); 20-30: 10 (1.7%); 30-40: 9 (1.5%).
Digital marketing platforms used	Social Media 188 (31.07%); WhatsApp Marketing 174 (28.76%); Website 91 (15.04%); Google Ads/SEO 73 (12.07%); Email 65 (10.74%); Others 34 (5.62%); None 365 (60.33%).
Social media platforms used	Facebook 177 (29.26%); WhatsApp 176 (29.09%); Instagram 145 (23.97%); LinkedIn 51 (8.43%); Snapchat 37 (6.12%); None 364 (60.17%).
Location (panchayat/municipality)	Kattappana Municipality 62 (10.2%); Chakkupallam 52 (8.6%); Upputhara 52 (8.6%); Vandanmedu 52 (8.6%); Vandiperiyar 51 (8.4%); Kumily 50 (8.3%); Elappara 46 (7.6%); Erattayar 45 (7.4%); Kanchiyar 45 (7.4%); Ayyappankoil 43 (7.1%); Peerumedu 43 (7.1%); Kokkayar 36 (6.0%); Peruvanthanam 28 (4.6%).

3. METHODOLOGY

This study used a quantitative, cross-sectional survey of UDYAM-registered MSMEs in rural Idukki (Kerala) as the sampling frame to maintain reliability of measures and policy alignment; unregistered/unorganized units were excluded because they lack consistent identifiers and typically fall outside government support instruments, limiting comparability and relevance. The frame listed n = 20,284 firms (19,694 micro, 567 small, 23 medium). A finite-population calculation at 95% confidence and 5% margin of error yielded a minimum n ≈ 377; using proportionate allocation and random selection within strata from the UDYAM registry, we reached a final realized sample of 605 enterprises—587 micro, 17 small, and 1 medium. The instrument operationalized a TOE-led model with TAM/DOI-informed perceptual mechanisms and used established multi-item Likert scales (5-point, 1 = strongly disagree to 5 = strongly agree), minimally adapted for MSME readability. Digital Marketing Capabilities (DMC) (Wang, 2020); Digital Marketing Orientation (DMO) (Mahmutović, 2021) which consist of 2 components – strategic digital marketing orientation (DMO_S) and practical/tactical digital marketing orientation (DMO_P); Relative Advantage (RA) and Compatibility (COMP)

from Moore and Benbasat (1991); Perceived Ease of Use (PEOU) (Davis, 1989); Trust (Pavlou and Gefen, 2004); Knowledge (Thong, 1999); Competitive Pressure (COMPETITION) (Premkumar and Ramamurthy, 1995); Customer Power (CUST_POWER) (Wu et al., 2003); Intention (INTENTION) and Adoption (ADOPTION) (Jelinek et al., 2006) are the scales adapted for the study. A pilot pre-test confirmed content validity, clarity of wording, and completion time; subsequent wording tweaks were made before rollout. Data collection was done using an online survey.

4. RESULTS

The final realized sample comprised 605 MSMEs—587 micro, 17 small, and 1 medium enterprises. Descriptive statistics (means, standard deviations, and ranges) for all latent constructs and adoption indicators showed adequate variance; inter-item and inter-construct correlations were in the expected directions. Basic screening removed duplicates and straight-liners; multivariate outliers were flagged via Mahalanobis distance (p <.001) and handled. The cleaned data were used for factor validation and structural modelling. Table I provides a summary of the descriptive analysis.

Table 2: Outer loadings

Items/Indicators	Outer loadings (standardized)
ADOPTION1 <- ADOPTION	0.981
ADOPTION2 <- ADOPTION	0.982
ADOPTION3 <- ADOPTION	0.979
ADOPTION4 <- ADOPTION	0.983
ADOPTION5 <- ADOPTION	0.977
CEO_KNOW <- Knowledge	0.172
COMP1 <- COMP	0.977
COMP2 <- COMP	0.982
COMP3 <- COMP	0.978
COMP4 <- COMP	0.979
COMPETITION1 <- COMPETITION	0.979
COMPETITION2 <- COMPETITION	0.985
COMPETITION3 <- COMPETITION	0.981
CUST_POWER1 <- CUST_POWER	0.981
CUST_POWER2 <- CUST_POWER	0.979
CUST_POWER3 <- CUST_POWER	0.981
CUST_POWER4 <- CUST_POWER	0.981
DMC1 <- DMC	0.976
DMC2 <- DMC	0.98
DMC3 <- DMC	0.978
DMC4 <- DMC	0.979
DMC5 <- DMC	0.98
DMO_P1 <- DMO_P	0.979
DMO_P2 <- DMO_P	0.978
DMO_P3 <- DMO_P	0.982
DMO_P4 <- DMO_P	0.972
DMO_P5 <- DMO_P	0.986
DMO_P6 <- DMO_P	0.981
DMO_S1 <- DMO_S	0.983
DMO_S2 <- DMO_S	0.977
DMO_S3 <- DMO_S	0.976
DMO_S4 <- DMO_S	0.983
DMO_S5 <- DMO_S	0.981
EMP_KNOW1 <- Knowledge	0.98
EMP_KNOW2 <- Knowledge	0.98
EMP_KNOW3 <- Knowledge	0.98
INTENTION1 <- INTENTION	0.98
INTENTION2 <- INTENTION	0.985
INTENTION3 <- INTENTION	0.977
PEOU1 <- PEOU	0.979
PEOU2 <- PEOU	0.984
PEOU3 <- PEOU	0.981
PEOU4 <- PEOU	0.979
PEOU5 <- PEOU	0.975
PEOU6 <- PEOU	0.982
PFC1 <- PFC	0.982
PFC2 <- PFC	0.982
PFC3 <- PFC	0.975
RA1 <- RA	0.98
RA2 <- RA	0.982
RA3 <- RA	0.981
RA4 <- RA	0.981
RA5 <- RA	0.976
RA6 <- RA	0.983
TRUST1 <- TRUST	0.985
TRUST2 <- TRUST	0.979
TRUST3 <- TRUST	0.976
TRUST4 <- TRUST	0.985

Table 3: Cronbach's alpha and composite reliability

Constructs	Cronbach's alpha (standardized)	Cronbach's alpha (unstandardized)	Composite reliability (rho_c)
ADOPTION	0.992	0.992	0.992
COMPATIBILITY	0.989	0.989	0.989
COMPETITION	0.988	0.988	0.988
CUST_POWER	0.99	0.99	0.99
DMC	0.991	0.991	0.991
DMO_P	0.993	0.993	0.993
DMO_S	0.992	0.992	0.992
INTENTION	0.987	0.987	0.987
Knowledge	0.838	0.839	0.9
PEOU	0.993	0.993	0.993
PFC	0.986	0.986	0.986
RA	0.993	0.993	0.993
TRUST	0.99	0.99	0.99

Table 4: Average variance extracted

Constructs	Average variance extracted (AVE)
Adoption	0.961
Compatibility	0.958
Competition	0.964
Cust_power	0.961
DMC	0.958
DMO_P	0.96
DMO_S	0.96
Intention	0.962
Knowledge	0.728
PEOU	0.96
PFC	0.96
RA	0.961
TRUST	0.963

convergent validity (Table 4). A weak item on CEO knowledge was dropped during the exploratory process, thereby boosting the reliability and AVE of the knowledge construct. Discriminant validity was established based on Fornell-Larcker and HTMT criteria (Tables 5 and 6). Figure 2 illustrates the measurement model used. Figure 2 illustrates the measurement model constructed for the study.

4.2. Structural Model and Model Fit

Covariance-based SEM (ML) showed excellent global fit ($\chi^2 = 1583.711$, $df = 1517$, $P = 0.114$; $\chi^2/df = 1.044$; RMSEA $= 0.009$ [90% CI: 0.000-0.013]; SRMR $= 0.018$; CFI/TLI $= 0.999$) (Table 7). Explained variance was high for Adoption ($R^2 = 0.854$) and low for Intention ($R^2 = 0.188$), which is consistent with behavioral models as multiple, diffuse beliefs shape intention, while the intention leads to adoption behavior link is tight once formed (Table 8). Predictive relevance (Q^2) was positive for both endogenous constructs, and f^2 diagnostic measures showed a large influence of Intention on Adoption and small-to-medium influences for the antecedents on Intention.

4.1. Measurement Validity

Psychometrics was exemplary. Outer loadings for items were ≥ 0.97 (Table 2), and reliability was also high throughout constructs (CR/$\alpha > 0.97$) (Table 3). AVE was > 0.50 for all factors, supporting

4.3. Path Estimates, Mediation, and Robustness

Path estimation and hypothesis testing results are shown in Table 9. The Intention → Adoption path was positive and strong ($\beta = 0.924$, $P < 0.001$). Significant positive antecedents of Intention included Perceived Ease of Use ($\beta = 0.184$, $P < 0.001$), Compatibility/

Table 5: Fornell-Larcker criterion

| Constructs	Adoption	Compatibility	Competition	Cust_power	DMC	DMO_P	DMO_S	Intention	Knowledge	PEOU	PFC	RA	Trust
Adoption	0.98												
Compatibility	0.191	0.979											
Competition	0.094	0.017	0.982										
Cust_power	0.129	−0.013	0.14	0.98									
DMC	0.164	0.05	0.051	0.026	0.979								
DMO_P	0.193	−0.012	−0.022	0.045	0.101	0.98							
DMO_S	0.156	0.021	0.011	0.081	0.088	0.164	0.98						
Intention	0.928	0.21	0.099	0.126	0.186	0.184	0.135	0.981					
Knowledge	0.164	0	0.003	0.033	0.159	0.053	0.122	0.17	0.853				
PEOU	0.198	0.119	−0.012	0.038	−0.03	0.074	0.04	0.218	0.005	0.98			
PFC	−0.083	−0.018	−0.003	−0.049	−0.074	0.019	0.007	−0.094	0.006	0.045	0.98		
RA	0.183	0.106	−0.062	−0.029	−0.021	0.034	0.111	0.178	0.048	0.014	0.023	0.98	
TRUST	0.199	0.054	0.022	0.073	0.059	−0.008	0.052	0.212	0.027	0.075	0.007	0.122	0.981

Table 6: HTMT ratio

Constructs	Adoption	Compatibility	Competition	Cust_power	DMC	DMO_P	DMO_S	Intention	Knowledge	PEOU	PFC	RA	Trust
Adoption													
Compatibility	0.191												
Competition	0.092	0.017											
Cust_power	0.129	0.015	0.14										
DMC	0.163	0.051	0.051	0.026									
DMO_P	0.193	0.012	0.021	0.045	0.101								
DMO_S	0.156	0.022	0.011	0.082	0.088	0.163							
Intention	0.928	0.212	0.099	0.127	0.186	0.183	0.133						
Knowledge	0.231	0.017	0.017	0.048	0.195	0.071	0.164	0.236					
PEOU	0.197	0.119	0.012	0.038	0.029	0.073	0.041	0.218	0.027				
PFC	0.083	0.017	0.003	0.049	0.074	0.019	0.015	0.093	0.01	0.045			
RA	0.182	0.106	0.062	0.029	0.022	0.032	0.112	0.178	0.058	0.014	0.022		
Trust	0.197	0.053	0.022	0.073	0.058	0.01	0.051	0.21	0.053	0.075	0.01	0.121	

Table 7: Model fit

Model Fit and Quality Indices	Estimated model	Null model	Interpretation
Chi-square	1583.711	78158.65	Lower values indicate better fit (compared to null model χ^2=78158.65)
Number of model parameters	194	58	
Number of observations	605	n/a	
Degrees of freedom	1517	1653	
P-value	0.114	0	
ChiSqr/df	1.044	47.283	Indicates excellent model fit
RMSEA	0.009	0.277	Very good fit; well below acceptable threshold
RMSEA LOW 90% CI	0	0.275	Confirms the model's excellent fit at a 90% confidence level
RMSEA HIGH 90% CI	0.013	0.278	
GFI	0.92	n/a	Good model fit
AGFI	0.91	n/a	Adjusted GFI also suggests a good model fit
PGFI	0.816	n/a	Acceptable parsimony-adjusted fit index
SRMR	0.018	n/a	Indicates a strong fit between the observed and predicted correlations
NFI	0.98	n/a	Excellent fit improvement over the null model
TLI	0.999	n/a	Near-perfect fit
CFI	0.999	n/a	Excellent comparative fit index
AIC	1971.711	n/a	Lower values preferred for model comparison
BIC	2826.326	n/a	Lower values preferred for model comparison

Capabilities (β = 0.163, P < 0.001), Trust (β = 0.159, P < 0.001), Strategic Digital Marketing Orientation (β = 0.149, P < 0.001), Relative Advantage (β = 0.142, P < 0.001), Knowledge (β = 0.127, P < 0.01), Competitive Pressure (β = 0.091, P < 0.05), and Customer Power (β = 0.083, P < 0.05). Perceived Financial Cost was negative and significant (β = −0.096, P < 0.05), while Tactical DMO was not significant. As shown in Table 10, bootstrap tests (5,000 resamples; bias-corrected CIs) confirmed partial mediation via Intention for key technological and organizational drivers (PEOU, Relative Advantage, Trust, Capabilities), a negative indirect effect for Financial Cost, and no mediation for Tactical DMO. The CB SEM Model is shown in Figure 3.

Figure 2: Measurement model
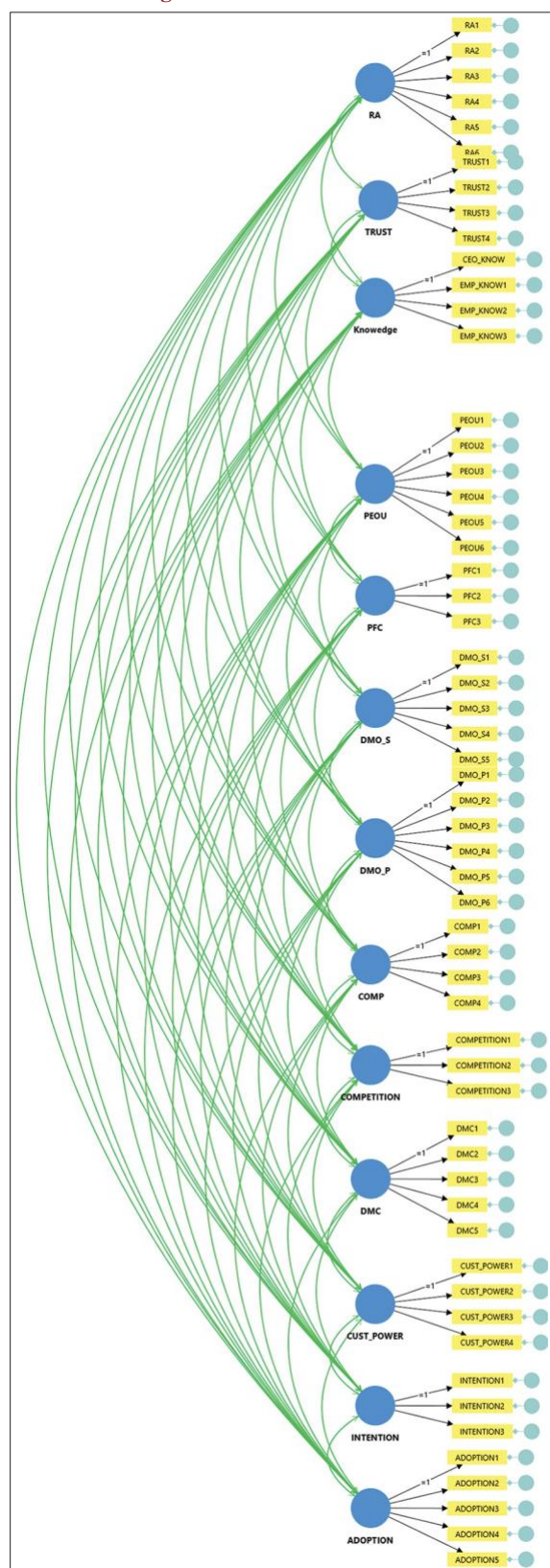
5. DISCUSSION

The results present a straightforward narrative. In these rural MSMEs, the biggest hurdle is not the act of using digital marketing once a decision is made; it is getting to that decision. Intention acts like a gate. When the owner and team decide "yes, we will do this," actual adoption follows. Our model explains a lot of the variation in real use, but only a modest share of the variation in intention. That means the tricky part is achieving intention adoption. Once they have confidence, the firm will start adopting.

What, then, helps owners to form that intention? Three technology beliefs emerge. First is ease of use. Tools that look simple, clear, and quick to learn boost intention. Small business owners wear many hats. If managing a social media page, posting, or running an ad seems unclear or time-consuming, they won't use it. When the tool looks easy, the mental barrier lowers. Second is perceived benefit. Owners act when they see how the tool will create more enquiries, more orders, better prices, or more consistent bookings. Creating posters of the "brand" isn't enough; they need a concise, credible connection between the effort and the benefit. Third is congruence with current work. If the tool aligns with the business's existing workflow—i.e., following up WhatsApp enquiries with a simple sales log rather than a sophisticated CRM—then it is significantly easier to use. These three beliefs—easy, better, fits—get individuals from interested to committed. Cost has the reverse impact. When budgets are tight and benefits unlikely, mere periodical costs loom large, so perceived financial cost lowers intention. Taken together, the message is straightforward: make it easy, show the payoff, make it fit, keep early costs low.

At the organisational level, factors that affect digital marketing adoption include strategic digital marketing orientation, readiness, and employee knowledge. A strategic orientation to digital marketing is beneficial as it conserves time and resources, making the statement, "this matters here." Readiness matters too: a little financial support, a basic device, a content creation plan, and a person with enough hours and knowledge to handle the marketing. Knowledge helps, but our results reveal that working knowledge and team habits matter more than just the CEO's own expertise. Also, a "tactical" approach to digital marketing, without a simple strategy, cannot shift intention. Teaching digital marketing is not enough. Companies do when they both will and know how, and with accompanying small, repeatable routines.

The outside environment provides a push, but it is not a substitute for weak routines or weak beliefs. Competition and client pressure drive companies toward action: seeing competitors online or customers requesting online catalogues can prompt companies to adopt digital marketing. Pressure alone, however, can become frustration in the absence of something that lowers the odds of taking a chance. The "something" is trust. The trust in digital platforms and digital marketing service providers alleviates fears of wasting money, losing information, or ending up with a problematic provider. Where alternatives are scarce, the price of error is steeper, and trust has more impact. When you trust the individuals and digital marketing tools you're working with, you're more likely to start and continue until you see outcomes.

We used the TOE framework as a skeleton and added two traditional concepts as supports: from TAM, perceived ease of

Table 8: R² values for the endogenous constructs

Endogenous Constructs	Original sample	Sample mean	Standard deviation	T statistics	P-values
Adoption	0.854	0.853	0.012	71.607	0
Intention	0.188	0.205	0.027	6.988	0

Table 9: Hypothesis test results

Hypothesized Relationships	Original sample (O)	Sample mean (M)	Standard deviation	T statistics	P-values	Null Hypothesis
Compatibility -> Intention	0.163	0.163	0.036	4.481	0	Rejected
Competition -> Intention	0.091	0.093	0.04	2.272	0.024	Rejected
CUST_POWER -> Intention	0.083	0.081	0.04	2.104	0.036	Rejected
DMC -> Intention	0.129	0.126	0.035	3.675	0	Rejected
DMO_P -> Intention	0.149	0.15	0.038	3.872	0	Rejected
DMO_S -> Intention	0.048	0.05	0.039	1.239	0.216	Fail to reject
Intention-> Adoption	0.924	0.924	0.006	143.022	0	Rejected
Knowledge -> Intention	0.127	0.129	0.039	3.29	0.001	Rejected
PEOU -> Intention	0.184	0.187	0.039	4.682	0	Rejected
PFC -> Intention	-0.096	-0.095	0.036	2.668	0.008	Rejected
RA -> Intention	0.142	0.142	0.038	3.782	0	Rejected

Table 10: Mediation analysis results

| Path	Effect on intention	P-value	Indirect effect on adoption	P-value	t-statistic	Type of mediation
Knowledge→Intention→Adoption	0.127	0.001	0.117	0.001	3.287	Partial Mediation
PEOU→Intention→Adoption	0.184	0	0.17	0	4.658	Partial Mediation
PFC→Intention→Adoption	−0.096	0.008	−0.089	0.008	2.67	Partial Mediation (Negative)
RA→Intention→Adoption	0.142	0	0.131	0	3.79	Partial Mediation
TRUST→Intention→Adoption	0.159	0	0.147	0	4.004	Partial Mediation
COMP→Intention→Adoption	0.163	0	0.151	0	4.502	Partial Mediation
COMPETITION→Intention→Adoption	0.091	0.024	0.084	0.024	2.273	Partial Mediation
CUST_POWER→Intention→Adoption	0.083	0.036	0.077	0.036	2.105	Partial Mediation
DMC→Intention→Adoption	0.129	0	0.12	0	3.669	Partial Mediation
DMO_P→Intention→Adoption	0.149	0	0.137	0	3.87	Partial Mediation
DMO_S→Intention→Adoption	0.048	0.216	0.045	0.216	1.24	No Mediation

use, and from DOI, relative advantage and compatibility. As a combination, it was successful in a small-firm, rural setting because it highlighted the few beliefs that actually change behaviour without building a highly cumbersome model. TOE tells us where to look—technology, organization, and environment—while the TAM/DOI beliefs explain how those components yield action: ease and fit reduce effort and disruption, salient advantage boosts payoff hopes, and trust reduces perceived danger—leaving intention and adoption as separate but linked constructs helped as well. Although the two are intimate partners, our observations suggest that treating them separately provides a cleaner and more precise picture: intention is the bottleneck, and adoption follows once intention is achieved. In short, TOE gives us the skeleton, the TAM/DOI beliefs give us the mechanism, and the result is a simple, robust explanation consistent with what real-life rural MSMEs report.

Digital marketing companies and public programs must utilize guided onboarding, mini demos, and small ad-credit pilots that produce first results in a few weeks. Each action must be tied to a simple, tangible metric the owner is passionate about—calls, messages, visits, bookings, repeat orders—that makes the benefit observable. Then establish do-ability with short, intensive digital marketing capability training programs. Over six to eight weeks, have teams practice a month's strategy: a simple

content plan, a few ads, a simple way to gather and follow up on leads, and a 30-min look at what worked. The goal isn't shiny dashboards; it's a doable practice that's right for the business and gets repeated. Finally, use local networks to build trust and lower search costs. District associations, producer groups, and tourist boards can organise peer showcases where owners can see what fellow nearby MSMEs have done, the costs involved, and the results achieved. Credible digital marketing companies that offer simple service, straightforward and simple contracts make the first step seem safe.

Block-level organisations/communities/district industries centres for MSMEs can offer digital marketing capability workshops with open slots and simple, practical curricula. Incentives should be introduced incrementally, tied to proof of progress: a voucher for opening a business page, credits for the first Ad campaign, and a modest amount of aid for a basic lead-tracking system after three months of consistent use. A district-level registry for digital marketing service providers, featuring a simple verification badge verified by government that includes references and services provided would enable owners to select providers with greater confidence. And government programs need to have a "demo first" policy: instead of theoretical sessions, need to provide practical live demonstration of how these businesses can used digital marketing to achieve their organisational goals.

Figure 3: CB SEM
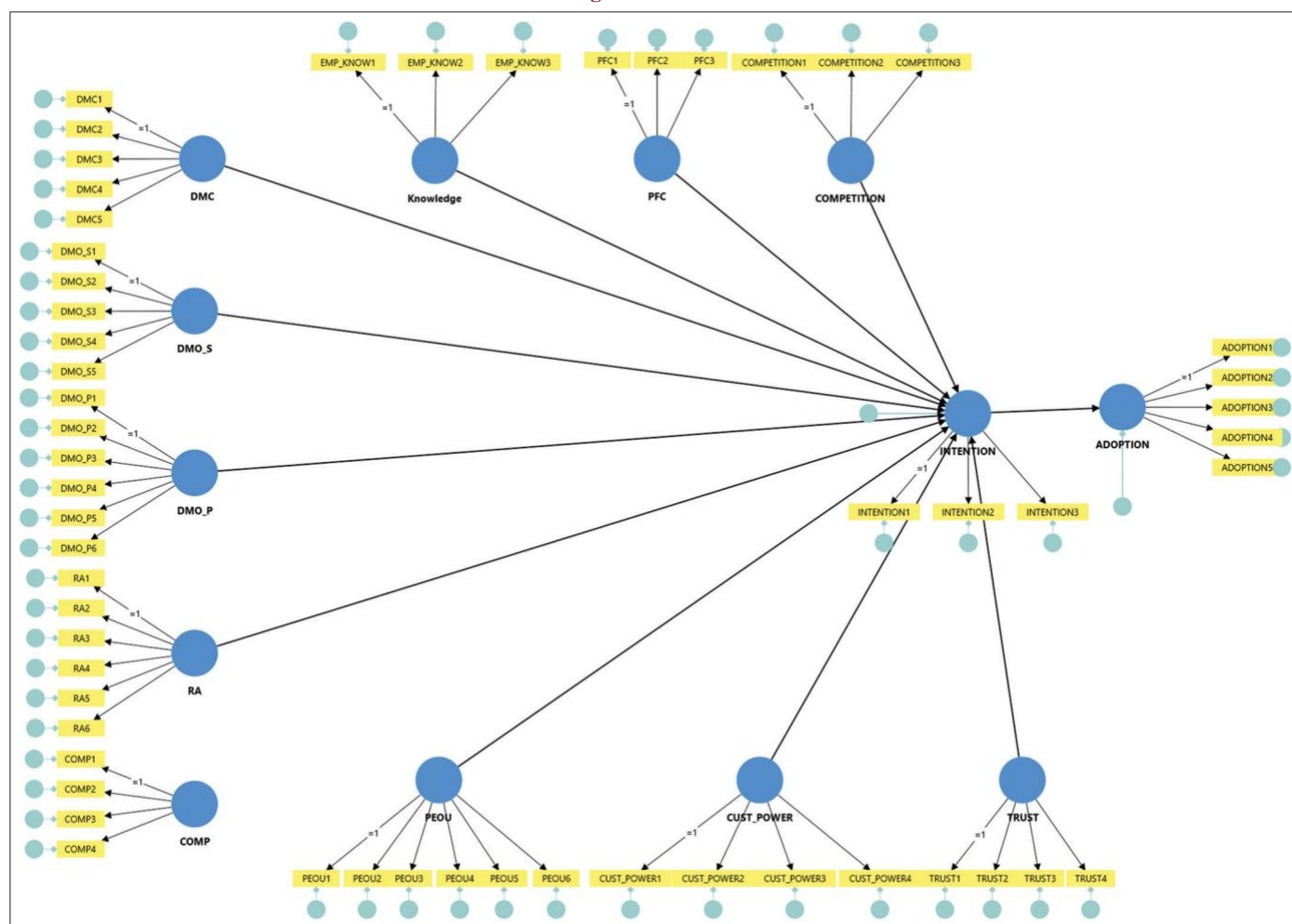
6. CONCLUSION

This paper examined drivers of digital marketing adoption in rural MSMEs using a TOE-leadership framework informed by TAM and DOI. The key finding is that intention is the adoption gateway. Once owners promise to adopt, actual use follows considerably. Intention rises as tools become perceived as user-friendly, offer benefits, and align with current habits. It also rises for companies that have strategic digital marketing orientation, readiness, and employee knowledge, and trust in platforms and dealers. Financial cost perceived reduces intention. These results deliver a practitioner playbook: streamline initial steps, provide value early on, create a limited, repeatable routine, and minimize danger. Policymakers should give milestone-based, rural-special support linked to UDYAM enrolment. This paper has limitations. It's cross-sectional, born from a single rural district, based on self-reports, and omitting unregistered entities. Future work should employ multi-district or longitudinal designs to test additional aspects of TAM/DOI using behavioural measures.

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