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Strategic Social Media Marketing Adoption and SME Performance: A Technology-Organization-Environment Approach

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Abstract

This study extends the understanding of social media adoption in Small and Medium-sized Enterprises (SMEs) by integrating technological complexity, cost, and organizational capability into the Technology-Organization-Environment (TOE) framework. It investigates how these factors influence the adoption of social media marketing strategies and, in turn, improve SME performance. Data were collected from 508 Indonesian SMEs, and Structural Equation Modeling was employed to test the proposed hypotheses. Findings reveal a notable hesitancy among SMEs to adopt social media marketing due to perceived technological challenges, including complexity, cost, and relative advantage. Conversely, organizational factors, such as top management support and employee capability, together with environmental pressures from customers and vendors, significantly facilitate adoption. Importantly, the study confirms that strategic social media marketing adoption positively enhances SME performance. This research contributes to the TOE framework literature by providing practical and theoretical insights for SMEs seeking to overcome adoption barriers and optimize digital marketing investments.

Keywords: Social media marketing, Adoption, Small and medium-sized enterprises, Technology-Organization-Environment framework, Performance

Introduction

The digital era has transformed how businesses operate, compelling firms to embrace technological innovations to stay competitive [1]. Among these innovations, social media has emerged as a vital tool for Small and Medium-sized Enterprises (SMEs), enabling them to engage customers, promote products, and expand market reach [2]. Recent reports indicate that nearly one-third of SMEs utilize social media platforms for marketing and operational purposes [3], highlighting its growing relevance in the SME sector. Beyond marketing, social media also facilitates customer engagement and feedback, shaping purchasing decisions and fostering stronger relationships with partners and suppliers.

Despite its potential, SMEs often face hurdles in adopting social media strategies. Limited financial resources, lack of technological expertise, and time constraints are common barriers that restrict effective integration [1, 4]. While prior studies have examined social media adoption broadly, few have systematically investigated the factors influencing SMEs' adoption decisions and their impact on business performance. Critical questions remain unanswered: What motivates SMEs to incorporate social media into their marketing strategies? How do organizational and environmental factors facilitate or hinder adoption? And, importantly, what measurable effects does social media marketing have on SME performance? Addressing

these questions requires a comprehensive framework capable of capturing the technological, organizational, and environmental dimensions that shape adoption behavior.

The Technology-Organization-Environment (TOE) framework provides a suitable theoretical lens for exploring these issues [5]. TOE identifies three key dimensions—technological, organizational, and environmental—that influence firms' decisions to adopt innovations. Technological factors include perceived benefits, complexity, and cost; organizational factors involve top management support and employee capabilities; and environmental factors encompass customer and supplier pressures [6, 7]. By considering all three dimensions, TOE offers a holistic approach to understanding SMEs' adoption of social media marketing, accounting for both internal and external determinants.

While TOE has been combined with other models such as the Technology Acceptance Model (TAM), the Theory of Planned Behavior, and UTAUT in previous studies [6, 8, 9], gaps remain in understanding specific SME contexts, particularly regarding perceived employee capability and financial considerations. Earlier research [6, 7, 9, 10] primarily focused on general adoption trends or entrepreneurial orientation, leaving the nuanced interplay of technological complexity, organizational readiness, and environmental pressures less explored. This study addresses these gaps by proposing an integrated framework that captures these underrepresented dimensions, offering deeper insights into SMEs' social media marketing adoption process.

In addition to theoretical contributions, this research has practical implications. By identifying the critical factors influencing adoption, SME managers can align digital marketing investments with organizational capabilities and environmental demands. The study also examines the impact of social media marketing on SME performance, highlighting how strategic adoption can enhance operational efficiency, customer engagement, and overall business outcomes. By bridging theoretical and practical perspectives, this study provides a roadmap for SMEs in developing economies to leverage social media effectively and strengthen their competitive position in the digital marketplace.

Literature Review and Hypothesis

Related studies

Recent research has consistently employed the Technology-Organization-Environment (TOE) framework to understand social media adoption among SMEs. **Table 1** summarizes some key studies in this area. Abed [10] advanced the field by highlighting critical technological and environmental drivers, including security concerns and pressure from trading partners, that influence social commerce adoption among Saudi Arabian SMEs. Building on this, Qalati *et al.* [9] developed an integrative model encompassing a wide range of factors such as cost-effectiveness, market visibility, and competitive pressures, offering a more comprehensive understanding of SMEs' social media adoption behavior. Eze *et al.* [6] extended these insights by identifying adoption challenges and proposing a robust analytical framework for navigating them.

Despite these contributions, prior studies often examine TOE dimensions in isolation, with limited attention to how technological, organizational, and environmental factors interact to influence adoption decisions. This gap suggests the need for a more holistic approach that considers the interconnectedness of these factors, particularly in the SME context, where resource constraints and organizational capabilities can substantially shape the adoption process.

Table 1. Related Studies on SMEs and TOE Framework
Rephrased Table: Key Studies on TOE Framework for Social Media Adoption in SMEs

Authors	TOE Dimensions	Contributions
Abed [10]	- Perceived Usefulness (Technological) - Security Concern (Technological) - Top Management Support (Organizational) - Organizational Readiness (Organizational) - Consumer Pressure (Environmental) - Trading Partner Pressure (Environmental)	The research expands the body of knowledge on social commerce by providing empirical evidence of the primary factors influencing its adoption among SMEs in Saudi Arabia.
Qalati *et al.* [9]	- Relative Advantage (Technological) - Cost-Effectiveness (Technological) - Compatibility (Technological) - Interactivity (Technological) - Visibility (Technological) - Top Management Support (Organizational) - Competitive Intensity (Environmental) - Competitive Pressure (Environmental) - Bandwagon Effect (Environmental)	This work deepens insight into social media integration within SMEs through a validated empirical framework that examines a broad range of adoption drivers.
Eze *et al.* [6]	- Compatibility (Technological) - Affordability (Technological) - Users' Acceptance Information (Organizational) - Efficiency Driven (Organizational) - Owner's Support (Organizational) - Competitor's Intelligence Gathering (Environmental) - Customer's Information Gathering (Environmental) - Provider Credibility (Environmental)	The study extends the TOE model by addressing SME-specific hurdles in social media marketing adoption, delivering a robust diagnostic instrument for analysis.
Qalati *et al.* [7]	- Relative Advantage (Technological) - Cost-Effectiveness (Technological) - Compatibility (Technological) - Interactivity (Technological) - Top Management Support (Organizational) - Entrepreneurial Orientation (Organizational) - Consumer	The research identifies critical technological, organizational, and environmental influences on SMEs' use of social media and resulting performance,

	Pressure (Environmental) - Competitor Pressure (Environmental)	introducing an innovative model with actionable implications for stakeholders.
This study	- Perceived Relative Advantage (Technological) - Perceived Complexity (Technological) - Perceived Cost (Technological) - Top Management Support (Organizational) - Availability of Financial Support (Organizational) - Perceived Employee Capability (Organizational) - Perceived Competitive Pressure (Environmental) - Perceived Customer Pressure (Environmental) - Perceived Vendor Support (Environmental)	This research refines the TOE framework by integrating lesser-examined elements such as perceived complexity and access to financing, thereby enriching comprehension of social media uptake in SMEs. It further offers practical guidance by demonstrating how employee skills and vendor assistance affect SME outcomes in emerging economies.

Notes: T, Technological; O, Organizational; E, Environmental.

Study objective

This research seeks to address the limitations in existing studies by incorporating a broader set of factors spanning technological, organizational, and environmental dimensions to develop a more holistic framework for understanding social media marketing adoption in SMEs. Extending the findings of Qalati *et al.* [7], which highlighted entrepreneurial orientation and competitive pressure, this study additionally examines variables that have received limited attention in prior research, such as perceived technological complexity and access to financial resources. By analyzing how these elements interact and influence both the adoption of social media and SME performance, this study not only expands the TOE framework but also provides a more nuanced understanding of the mechanisms shaping adoption decisions. Furthermore, this research emphasizes the importance of human and relational aspects, including employee capabilities and vendor support, offering managers actionable guidance for navigating the adoption of digital marketing technologies in emerging economies.

SME performance

In today's competitive business environment, SMEs must optimize performance to survive and grow. Performance is typically defined as the extent to which an enterprise achieves its operational and strategic objectives [11], with marketing activities recognized as critical drivers [8]. While previous research has identified individual factors affecting SME performance [12, 13], few studies have examined the combined influence of internal and external determinants. Addressing this gap, the present study explores how social media marketing adoption, influenced by technological, organizational, and environmental factors, contributes to improved SME performance in Indonesia.

Technology-organization-environment (TOE) framework

The TOE framework provides a comprehensive perspective for analyzing organizational technology adoption, integrating three core dimensions: technological, organizational, and environmental [5]. Technological factors refer to an organization's technical capabilities and the perceived advantages or barriers of new technologies. Organizational factors encompass the firm's internal characteristics, such as size, structure, and resource allocation. Environmental factors include external forces, such as market trends, competitive pressures, and regulatory influences [14]. The framework has been widely applied across industries, including tourism [15] and e-commerce [16], highlighting its versatility in explaining adoption behaviors.

In the context of SME social media marketing, TOE offers a robust analytical tool for understanding adoption drivers. Prior studies suggest that technological considerations, such as perceived usefulness and ease of use, strongly influence adoption decisions [9], although organizational and environmental factors may also play a critical role [17]. Challenges faced by SMEs—such as resource constraints, limited technical expertise, and market pressures—underscore the value of using TOE to systematically examine adoption behavior [6].

This study applies the TOE framework to identify and analyze the key determinants of social media marketing adoption among SMEs. By examining technological capabilities, organizational readiness, and environmental pressures, this research provides a comprehensive understanding of the adoption process. The framework offers both theoretical insight and practical guidance, helping SMEs implement social media strategies effectively while navigating the complexities of a rapidly evolving digital business environment.

Technology-related factors

The rapid evolution of digital technologies has reshaped business operations, compelling SMEs to adopt innovative tools like social media marketing [6, 9]. Technological factors encompass the internal capabilities of the firm as well as external technological resources that enable effective implementation [8]. Prior experience with technology, whether gained within the firm or through external exposure, encourages a more favorable perception of new innovations [6].

Perceived Relative Advantage refers to the degree to which SMEs believe that social media marketing offers superior benefits compared to existing practices, such as cost efficiency, improved customer interaction, broader market reach, and faster information dissemination [7, 8]. This perception strongly motivates SMEs to adopt such platforms.

H1a: SMEs perceiving higher relative advantages from technology are more likely to implement social media marketing strategies.

Perceived Complexity relates to the anticipated difficulty or effort required to utilize new technologies [1]. When SMEs consider social media platforms technically challenging, the adoption process becomes slower and less effective [8].

H1b: Greater perceived complexity reduces the likelihood of SMEs adopting social media marketing.

Perceived Cost includes financial considerations such as investment in platforms, paid promotions, and staff training [2]. Limited budgets and uncertainty regarding returns often hinder SMEs from investing in social media initiatives [8].

H1c: Higher perceived costs negatively influence SMEs' social media adoption.

Organization-related factors

Organizational factors capture the internal structure, resources, and capabilities that affect SMEs' technology adoption decisions [6]. This includes firm characteristics such as size and management hierarchy, as well as resource availability in terms of financial capacity and employee skills [18]. Key drivers include support from top management, adequate financial resources, and the competency of employees.

Top Management Support refers to the guidance, encouragement, and resources provided by leaders to facilitate adoption [8]. When managers recognize the value of social media marketing, they can allocate the necessary resources and create an environment conducive to adoption.

H2a: Strong top management support increases the probability of SMEs adopting social media marketing.

Financial Resources pertain to the availability of funds to invest in new technologies, including tools, training, and operational costs [1]. Sufficient financial resources allow SMEs to overcome investment barriers and adopt social media effectively.

H2b: Greater financial availability enhances SMEs' likelihood of adopting social media marketing.

Employee Capability reflects the skills, knowledge, and competence of staff in using new technologies [19]. Employees with higher expertise and willingness to learn facilitate smoother adoption and implementation.

H2c: SMEs with higher perceived employee capabilities are more likely to implement social media marketing.

Environment-related factors

Environmental factors consist of external and internal pressures that influence SMEs' adoption of social media, such as competitive forces, customer expectations, and vendor support [6]. Previous research shows that competition, customer demand, and vendor assistance significantly affect adoption decisions [8].

Perceived Competitive Pressure occurs when SMEs feel compelled to adopt social media due to actions taken by rivals in the same industry. Competitive pressures encourage SMEs to expand market reach and maintain relevance [8].

H3a: SMEs facing higher competitive pressure are more likely to adopt social media marketing.

Perceived Customer Pressure reflects the influence of customers' expectations and demands, motivating SMEs to align with evolving market preferences [1].

H3b: SMEs experiencing greater customer pressure are more inclined to adopt social media marketing.

Vendor Support includes assistance provided by technology providers, such as technical guidance and training, which reduces the perceived risk of adoption [8].

H3c: Higher vendor support positively influences SMEs' social media adoption.

Social media marketing adoption

Social media has emerged as a crucial strategic tool across all business sectors, particularly for SMEs seeking to expand reach and strengthen customer engagement [2]. Platforms such as Facebook, Instagram, Twitter, and LinkedIn enable interactive communication, facilitating the creation and dissemination of information on a broad scale [1, 6]. For SMEs, these platforms serve not only as marketing channels but also as mechanisms for building long-term relationships and enhancing customer loyalty [1, 20].

During periods of crisis or market disruption, adopting social media marketing can be critical for survival, allowing SMEs to maintain close connections with customers and supply chain partners while controlling operational costs [20, 21]. By facilitating two-way communication and fostering interactions among stakeholders, social media marketing helps SMEs overcome limitations caused by resource constraints and limited technical expertise [20].

The benefits of adopting social media marketing are multifaceted. Prior studies have documented improvements in knowledge sharing, cost efficiency, market visibility, customer engagement, and product or service development [1, 2, 9]. Furthermore, empirical evidence indicates that SMEs leveraging social media marketing experience measurable enhancements in overall performance, including increased sales, operational efficiency, and competitive advantage [9, 19]. The successful integration of social media marketing is often contingent on SMEs' ability to leverage technological, organizational, and environmental factors, as outlined in the TOE framework [7].

H4: SMEs that implement social media marketing effectively are likely to achieve improved business performance.

Research Model

This study constructs its conceptual framework based on the Technology-Organization-Environment (TOE) model proposed by Tornatzky *et al.* [5], which identifies three critical domains influencing technology adoption: technological, organizational, and environmental factors. The TOE framework has been extensively applied to SMEs to explain how contextual factors shape adoption decisions and operational outcomes [6, 8].

In this research, the technological dimension encompasses perceived complexity, relative advantage, and adoption cost; the organizational dimension includes employee capabilities and availability of financial resources; and the environmental dimension addresses competitive pressure, customer expectations, and vendor support. By integrating these variables, the model captures the multiple drivers of social media marketing adoption and their combined effect on SME performance.

The proposed framework illustrates the relationships between TOE factors, social media marketing adoption, and subsequent performance improvements. **Figure 1** presents the conceptual model, demonstrating how technological, organizational, and environmental elements collectively influence adoption decisions, ultimately enhancing SMEs' operational and financial outcomes. This model provides the foundation for hypothesis testing and offers a comprehensive lens for analyzing the adoption process in SME contexts.
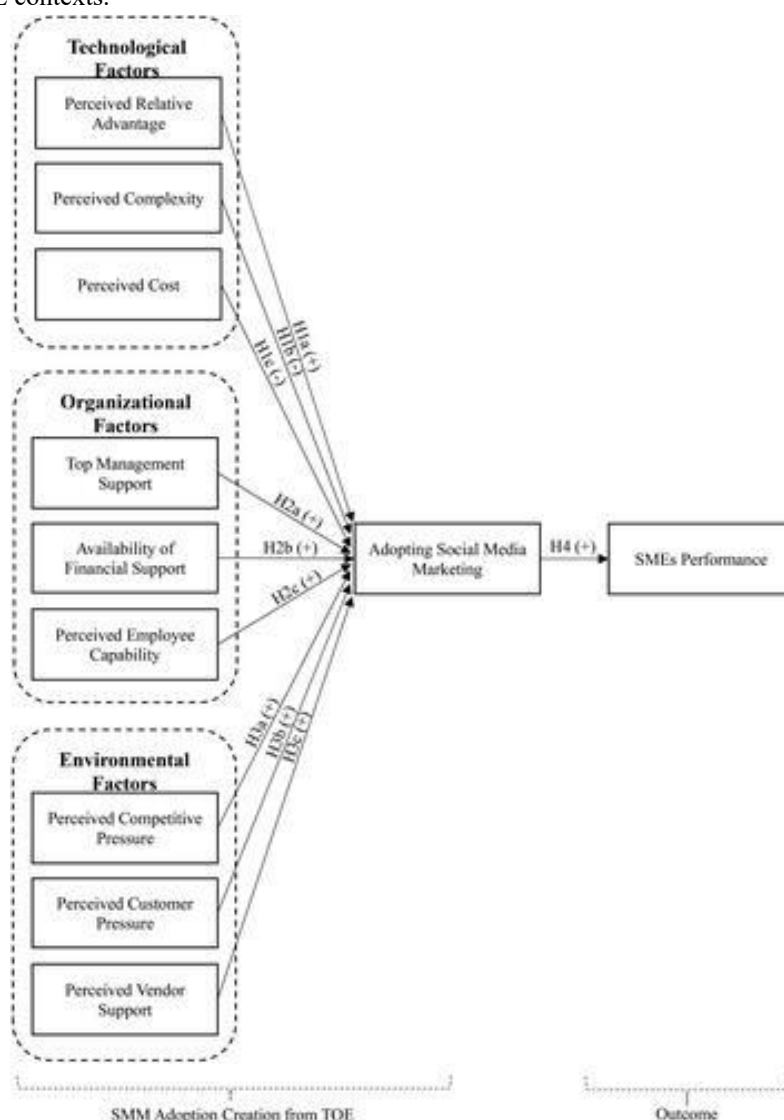
Figure 1. Proposed conceptual model predicting SMEs performance

Methods

Research context

In the digital era, social media has emerged as a critical instrument for SMEs aiming to enhance their visibility, engage customers, and improve overall business performance. Platforms such as Facebook, Instagram, and Twitter allow SMEs to communicate interactively with clients, share information widely, and cultivate long-term relationships. Despite its potential

benefits, many SMEs face challenges in adopting social media marketing due to limited financial resources, insufficient technical skills, and time constraints. These limitations often hinder effective implementation and can negatively affect operational outcomes.

This study investigates the factors influencing SMEs' adoption of social media marketing through the lens of the Technology-Organization-Environment (TOE) framework. The analysis considers technological aspects, including perceived relative advantage, perceived complexity, and perceived cost; organizational factors, such as top management support, availability of financial resources, and employee capability; and environmental influences, including competitive pressure, customer expectations, and vendor support. Additionally, the study explores the extent to which adopting social media marketing impacts SMEs' performance, providing insights into strategies for improving operational effectiveness and competitiveness.

Operationalization of variables

The constructs in this study are measured using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Perceived relative advantage refers to the degree to which SMEs perceive social media marketing as offering greater benefits compared to traditional marketing methods, thereby enhancing business performance and customer engagement. Perceived complexity captures the challenges or difficulties associated with learning, implementing, and managing social media platforms, which may hinder adoption. Perceived cost represents the financial investment required to adopt social media marketing, including platform fees, promotional expenses, and employee training, which can act as barriers to implementation.

Top management support reflects the extent to which organizational leadership facilitates social media adoption by providing guidance, allocating necessary resources, and fostering a supportive environment. The availability of financial resources measures whether SMEs have sufficient funds to cover the costs associated with social media marketing without adversely affecting other business operations. Employee capability captures the skills, knowledge, and competencies of staff in effectively utilizing social media tools and integrating them into daily business practices.

Environmental factors encompass the pressures and influences external to the organization. Competitive pressure refers to the influence of competitors' adoption of social media, motivating SMEs to implement similar strategies to remain competitive. Customer pressure captures the expectations and demands from clients for businesses to engage through social media channels. Vendor support reflects the guidance and assistance provided by technology providers, facilitating the adoption and effective use of social media marketing tools.

Together, these variables provide a comprehensive framework for analyzing the interplay between technological, organizational, and environmental factors in shaping social media marketing adoption and its subsequent impact on SME performance.

Methods

Research variables

Perceived competitive pressure is conceptualized as the extent to which SMEs feel pressure from external competitors within their industry, which can influence their decision to adopt social media marketing. Similarly, perceived customer pressure reflects the degree of expectations and demands from clients that encourage SMEs to implement social media strategies to meet evolving customer needs. Perceived vendor support encompasses the assistance and guidance provided by technology vendors, including technical support and training, which can reduce adoption risks and facilitate SMEs' engagement with social media marketing.

Social media marketing adoption is defined as the use of interactive online communication platforms that allow SMEs to share information, engage customers, and promote products and services continuously. This form of marketing enables businesses to establish two-way communication with customers and interact with other stakeholders in real-time. SMEs' performance is viewed as the ability of firms to achieve desired business outcomes through strategic activities and effective utilization of resources, particularly in the context of marketing initiatives. All constructs were measured using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Sampling and data collection

The study employed a non-probability, purposive sampling method to select SMEs actively using social media in their marketing operations. Participants were eligible if their businesses met the study's criteria for relevance and capability to provide insights regarding social media adoption. Ethical approval was obtained from the Ethical Review Board of the College of Management at Chaoyang University of Technology prior to data collection.

Data were gathered using an online survey hosted on Google Forms, distributed randomly through social media platforms, including Facebook, Instagram, and WhatsApp. The survey was structured in three sections: an informed consent form, general business profile questions (such as ownership type, employee count, and annual revenue), and research-specific items

addressing the study variables. Data collection spanned two months, yielding 508 valid responses. This sample size exceeded the minimum requirement determined using the 10-times rule for partial least squares structural equation modeling (PLS-SEM), ensuring robust analytical validity.

Data analysis
The study employed Structural Equation Modeling (SEM) using SmartPLS 4.0, which supports bootstrapping to provide robust, non-parametric inference suitable for complex models. The analysis proceeded in two stages. First, the measurement model was assessed to verify reliability and validity, including convergent validity using Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha (CA). Discriminant validity was evaluated using the Fornell-Larcker criterion, Heterotrait-Monotrait ratio (HTMT), and cross-loading matrices. Second, the structural model was examined through R-square values to assess explanatory power, while model fit was verified using SRMR, d_ULS, d_G, and NFI indices. Once measurement and structural model criteria were satisfied, hypothesis testing was conducted.

Results

Sample profile
The final dataset included 508 responses collected over two months. Business owners represented the majority of participants (52%), followed by employees (30.3%). Most SMEs had up to 300 million in employees (76.4%), and annual revenues predominantly ranged from 300 million to 2.5 billion, with the trade, hotel, and restaurant sectors representing the largest share (41.1%), followed by the service sector (21.3%). Regarding social media usage, the majority of SMEs reported moderate (39.8%) or extensive (29.3%) engagement, with frequent use reported by 41.3% of respondents and Instagram identified as the most widely utilized platform (44.3%). These findings demonstrate the active involvement of SMEs in social media marketing and provide a context for interpreting adoption and performance outcomes. Detailed sample characteristics are presented in **Table 2**.

Table 2. Sample Profile

Measure	Items	Frequency	(%)
Role in the organization	Business owners	264	52.0
	Managers	90	17.7
	Staff members	154	30.3
Total workforce size	1–5 employees	315	62.0
	6–19 employees	146	28.7
	20–99 employees	47	9.3
Yearly turnover	≤ IDR 300 million	388	76.4
	IDR 300 million – 2.5 billion	103	20.3
	IDR 2.5 billion – 50 billion	17	3.3
Industry sector of SMEs	Farming & agriculture	55	10.8
	Livestock rearing	35	6.9
	Forestry	6	1.2
	Fisheries	6	1.2
	Mining & quarrying	14	2.8
	Manufacturing & processing	35	6.9
	Utilities (electricity, gas, water)	11	2.2
	Construction	7	1.4
	Retail, hospitality & food services	209	41.1
	Transportation & telecom	6	1.2
	Financial, leasing & business services	16	3.1
	Professional & administrative services	108	21.3
Extent of social media adoption	Very limited	79	15.6
	Elementary	78	15.4
	Intermediate	202	39.8
	Advanced	149	29.3
Regularity of social media usage for business	Rarely	81	15.9
	Occasionally	92	18.1
	Frequently	210	41.3
	Very frequently	125	24.6
Social media channels utilized	Facebook	106	20.9
	X (formerly Twitter)	15	3.0
	LinkedIn	5	1.0
	WhatsApp	88	17.3
	YouTube	10	2.0
	Instagram	225	44.3
	TikTok	52	10.2
	Telegram	5	1.0

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Common method variance

To evaluate the potential influence of common method variance (CMV), the study applied Harman's Single Factor test. This approach examines whether a single factor accounts for the majority of covariance among the research items [22]. The analysis indicated that the largest factor explained 16.3% of the total variance, which is well below the commonly accepted threshold of 50%. This suggests that CMV is not a significant issue, and the responses are unlikely to be biased by the measurement method.

Validity and reliability

The study next assessed the measurement model to ensure both reliability and validity of the constructs. Convergent validity was confirmed as all outer loadings surpassed the recommended value of 0.70, demonstrating that each item reliably reflects its intended construct [23]. Internal consistency was evaluated using Cronbach's Alpha (CA) and Composite Reliability (CR), with all values exceeding 0.70, indicating robust reliability across the constructs. In addition, the Average Variance Extracted (AVE) values were all above 0.50, providing further evidence of satisfactory convergent validity. These results confirm that the measurement items are both consistent and valid for subsequent structural analysis. **Table 3** presents the detailed findings for convergent validity and reliability.

Table 3. Validity and Reliability. (Table view)

Construct	Items	OL	CA	CR	AVE
Perceived Relative Advantage	PRA.1	0.802	0.822	0.823	0.652
	PRA.2	0.834			
	PRA.3	0.794			
	PRA.4	0.800			
Perceived Complexity	PC.1	0.788	0.836	0.863	0.664
	PC.2	0.812			
	PC.3	0.861			
	PC.4	0.796			
Perceived Cost	PCT.1	0.847	0.881	0.905	0.733
	PCT.2	0.846			
	PCT.3	0.886			
	PCT.4	0.845			
Top Management Support	TMS.1	0.785	0.817	0.819	0.646
	TMS.2	0.830			
	TMS.3	0.804			
	TMS.4	0.794			
Availability of Financial Support	AFS.1	0.793	0.802	0.805	0.627
	AFS.2	0.809			
	AFS.3	0.776			
	AFS.4	0.787			
Perceived Employee Capability	PEC.1	0.791	0.820	0.823	0.649
	PEC.2	0.819			
	PEC.3	0.798			
	PEC.4	0.814			
Perceived Competitive Pressure	PCMP.1	0.812	0.721	0.727	0.641
	PCMP.2	0.774			
	PCMP.3	0.815			
Perceived Customer Pressure	PCSP.1	0.773	0.775	0.786	0.596
	PCSP.2	0.816			
	PCSP.3	0.735			
	PCSP.4	0.762			
Perceived Vendor Support	PVS.1	0.808	0.818	0.819	0.647
	PVS.2	0.798			
	PVS.3	0.830			
	PVS.4	0.781			
Adopting Social Media Marketing	ASMM.1	0.800	0.741	0.743	0.658
	ASMM.2	0.829			
	ASMM.3	0.805			
SMEs Performance	SP.1	0.722	0.887	0.888	0.597

SP.2	0.774	
SP.3	0.767	
SP.4	0.808	
SP.5	0.785	
SP.6	0.791	
SP.7	0.761	

Notes: Threshold for OL > 0.70; CA > 0.70; CR > 0.70 and AVE > 0.50.

Discriminant Validity

Discriminant validity was evaluated using three complementary approaches to ensure that each construct measures a distinct concept. First, the Fornell-Larcker criterion was applied, showing that the square root of each construct's AVE (highlighted along the diagonal) exceeded the correlations with other constructs, confirming satisfactory discriminant validity [24]. Second, the heterotrait-monotrait ratio (HTMT) was examined, with all values falling below the recommended threshold of 0.95, further indicating that the constructs are empirically distinct [25]. Third, the cross-loading analysis was conducted to compare the loadings of each item on its intended construct versus all other constructs. The results showed that items consistently loaded more strongly on their respective constructs than on others, supporting discriminant validity [23].

In addition, multicollinearity among constructs was assessed using the Variance Inflation Factor (VIF). All VIF values were below 3, indicating that multicollinearity does not pose a concern in this dataset [23]. Collectively, these results demonstrate that each construct is distinct and reliable, providing a solid foundation for testing the structural model and evaluating the proposed hypotheses.

Table 4. Fornell-Larcker Criterion.

Construct	1	2	3	4	5	6	7	8	9	10	11
Perceived Relative Advantage (1)	**0.807**										
Perceived Complexity (2)	0.168	**0.815**									
Perceived Cost (3)	0.168	0.680	**0.856**								
Top Management Support (4)	0.513	0.298	0.290	**0.804**							
Availability of Financial Support (5)	0.504	0.238	0.346	0.634	**0.792**						
Perceived Employee Capability (6)	0.603	0.243	0.268	0.607	0.663	**0.806**					
Perceived Competitive Pressure (7)	0.680	0.331	0.331	0.553	0.551	0.541	**0.801**				
Perceived Customer Pressure (8)	0.696	0.331	0.347	0.596	0.618	0.666	0.696	**0.772**			
Perceived Vendor Support (9)	0.554	0.301	0.315	0.651	0.669	0.658	0.564	0.653	**0.804**		
Adopting Social Media Marketing (10)	0.580	0.238	0.230	0.633	0.654	0.702	0.555	0.654	0.649	**0.811**	
SMEs Performance (11)	0.607	0.236	0.177	0.604	0.595	0.621	0.539	0.556	0.673	0.673	**0.773**

Notes: The diagonal bolded values were the square root of AVE.

Table 5. Heterotrait-Monotrait Ratio. (Table view)

Construct	1	2	3	4	5	6	7	8	9	10	11
Perceived Relative Advantage (1)											
Perceived Complexity (2)	0.196										
Perceived Cost (3)	0.205	0.802									
Top Management Support (4)	0.624	0.346	0.330								
Availability of Financial Support (5)	0.623	0.479	0.411	0.781							
Perceived Employee Capability (6)	0.729	0.283	0.298	0.736	0.816						
Perceived Competitive Pressure (7)	0.879	0.378	0.416	0.717	0.726	0.694					
Perceived Customer Pressure (8)	0.869	0.418	0.423	0.742	0.851	0.828	0.926				
Perceived Vendor Support (9)	0.673	0.356	0.361	0.798	0.820	0.799	0.728	0.813			
Adopting Social Media Marketing (10)	0.740	0.284	0.273	0.811	0.778	0.896	0.755	0.851	0.827		
SMEs Performance (11)	0.711	0.262	0.187	0.706	0.704	0.724	0.664	0.661	0.704	0.826	

Notes: Strong HTMT indicated with < 0.85, and < 0.95 is acceptable.

Table 6. Cross-Loading Matrix and Multicolinearity Test (VIF).

Items	Cross-Loading Matrix											VIF
	PRA	PC	PCT	TMS	AFS	PEC	PCMP	PCSP	PVS	ASMM	SP	
PRA.1	**0.802**	0.097	0.139	0.362	0.346	0.476	0.562	0.572	0.415	0.473	0.432	*1.727*
PRA.2	**0.834**	0.108	0.126	0.436	0.395	0.531	0.554	0.565	0.463	0.479	0.503	*1.913*
PRA.3	**0.794**	0.185	0.175	0.423	0.467	0.458	0.544	0.571	0.458	0.450	0.523	*1.678*
PRA.4	**0.800**	0.155	0.154	0.435	0.424	0.482	0.534	0.541	0.455	0.471	0.505	*1.714*
PC.1	0.158	**0.788**	0.465	0.282	0.313	0.222	0.236	0.282	0.254	0.246	0.220	*1.440*
PC.2	0.062	**0.812**	0.575	0.157	0.274	0.156	0.213	0.245	0.199	0.131	0.100	*2.068*

												VIF
PC.3	0.148	**0.861**	0.631	0.255	0.356	0.206	0.260	0.291	0.267	0.193	0.196	*2.593*
PC.4	0.149	**0.796**	0.577	0.236	0.336	0.183	0.224	0.245	0.240	0.163	0.220	*2.190*
PCT.1	0.119	0.562	**0.847**	0.208	0.303	0.182	0.276	0.269	0.267	0.182	0.126	*2.501*
PCT.2	0.106	0.597	**0.846**	0.184	0.270	0.147	0.241	0.245	0.219	0.124	0.069	*2.709*
PCT.3	0.191	0.606	**0.886**	0.330	0.326	0.296	0.322	0.340	0.287	0.228	0.200	*2.339*
PCT.4	0.182	0.572	**0.845**	0.234	0.277	0.247	0.275	0.309	0.284	0.221	0.171	*1.929*
TMS.1	0.340	0.307	0.293	**0.785**	0.491	0.400	0.422	0.446	0.521	0.472	0.404	*1.689*
TMS.2	0.401	0.234	0.246	**0.830**	0.486	0.475	0.435	0.466	0.512	0.525	0.483	*1.858*
TMS.3	0.426	0.204	0.198	**0.804**	0.533	0.553	0.466	0.478	0.512	0.511	0.513	*1.685*
TMS.4	0.475	0.219	0.200	**0.794**	0.527	0.516	0.455	0.524	0.549	0.525	0.534	*1.630*
AFS.1	0.362	0.329	0.257	0.512	**0.793**	0.517	0.450	0.499	0.567	0.502	0.484	*1.641*
AFS.2	0.409	0.279	0.242	0.519	**0.809**	0.523	0.424	0.463	0.563	0.499	0.476	*1.699*
AFS.3	0.394	0.321	0.329	0.467	**0.776**	0.518	0.418	0.497	0.463	0.419	0.434	*1.679*
AFS.4	0.434	0.331	0.278	0.505	**0.787**	0.541	0.451	0.499	0.516	0.482	0.486	*1.663*
PEC.1	0.365	0.186	0.199	0.420	0.504	**0.791**	0.356	0.491	0.493	0.503	0.420	*1.782*
PEC.2	0.488	0.201	0.216	0.492	0.545	**0.819**	0.402	0.563	0.553	0.598	0.502	*1.841*
PEC.3	0.500	0.159	0.168	0.517	0.523	**0.798**	0.489	0.521	0.530	0.579	0.526	*1.703*
PEC.4	0.578	0.235	0.279	0.519	0.560	**0.814**	0.489	0.566	0.542	0.576	0.546	*1.786*
PCMP.1	0.541	0.173	0.215	0.412	0.409	0.414	**0.812**	0.548	0.447	0.447	0.411	*1.454*
PCMP.2	0.506	0.350	0.368	0.422	0.464	0.379	**0.774**	0.546	0.408	0.394	0.352	*1.412*
PCMP.3	0.579	0.192	0.228	0.490	0.454	0.498	**0.815**	0.576	0.493	0.485	0.517	*1.385*
PCSP.1	0.531	0.198	0.214	0.433	0.435	0.507	0.550	**0.773**	0.533	0.511	0.411	*1.511*
PCSP.2	0.591	0.236	0.253	0.536	0.515	0.554	0.601	**0.816**	0.546	0.584	0.501	*1.598*
PCSP.3	0.510	0.393	0.405	0.417	0.536	0.458	0.517	**0.735**	0.484	0.401	0.358	*1.527*
PCSP.4	0.511	0.232	0.236	0.442	0.435	0.527	0.474	**0.762**	0.449	0.497	0.426	*1.516*
PVS.1	0.439	0.200	0.201	0.509	0.487	0.512	0.432	0.508	**0.808**	0.516	0.464	*1.849*
PVS.2	0.421	0.256	0.274	0.547	0.519	0.497	0.454	0.508	**0.798**	0.491	0.474	*1.726*
PVS.3	0.426	0.290	0.258	0.556	0.581	0.539	0.448	0.503	**0.830**	0.498	0.495	*1.941*
PVS.4	0.487	0.225	0.277	0.489	0.562	0.564	0.476	0.574	**0.781**	0.572	0.496	*1.543*
ASMM.1	0.400	0.172	0.194	0.484	0.462	0.532	0.459	0.534	0.498	**0.800**	0.495	*1.492*
ASMM.2	0.515	0.189	0.157	0.517	0.490	0.594	0.459	0.536	0.522	**0.829**	0.573	*1.527*
ASMM.3	0.491	0.215	0.210	0.538	0.514	0.580	0.435	0.522	0.557	**0.805**	0.566	*1.413*
SP.1	0.418	0.129	0.082	0.429	0.408	0.444	0.399	0.393	0.448	0.522	**0.722**	*1.775*
SP.2	0.491	0.178	0.120	0.478	0.404	0.490	0.441	0.422	0.459	0.540	**0.774**	*1.915*
SP.3	0.494	0.202	0.174	0.470	0.511	0.502	0.465	0.475	0.495	0.521	**0.767**	*1.883*
SP.4	0.495	0.181	0.112	0.482	0.461	0.503	0.396	0.431	0.468	0.533	**0.808**	*2.200*
SP.5	0.434	0.201	0.156	0.469	0.498	0.497	0.377	0.420	0.470	0.487	**0.785**	*2.098*
SP.6	0.503	0.190	0.167	0.502	0.492	0.511	0.439	0.449	0.463	0.536	**0.791**	*2.058*
SP.7	0.444	0.200	0.152	0.432	0.449	0.410	0.393	0.414	0.447	0.496	**0.761**	*1.972*

Notes: VIF, Variance Inflation Factors; The threshold for VIF < 5 acceptable and moderate, VIF < 3 strongly no collinearity.

Hypothesis Testing

The structural model was assessed using Structural Equation Modeling (SEM) via Smart-PLS 4.0 to evaluate the relationships proposed in the study and determine the model's explanatory power [26]. The evaluation process involved multiple steps, beginning with an examination of the R-squared (R^2) values for each endogenous construct. An R^2 value above 0.1, approaching 1, is considered indicative of satisfactory explanatory power [26]. The analysis revealed that the adoption of social media marketing among SMEs has an R^2 value of 0.610, demonstrating that technology factors (perceived relative advantage, perceived complexity, perceived cost), organizational factors (top management support, availability of financial support, perceived employee capability), and environmental factors (perceived competitive pressure, perceived customer pressure, perceived vendor support) collectively account for a substantial portion of variance in adoption behavior. Moreover, SMEs' performance is influenced by the adoption of social media marketing, with an R^2 value of 0.453, indicating that social media adoption explains nearly half of the variance in performance outcomes. These values confirm that the model provides a meaningful representation of the hypothesized relationships.

The overall fit of the model was also evaluated using several indices. The standardized root mean square residual (SRMR) was 0.073, the squared Euclidean distance (d_ULS) was 5.524, geodesic distance (d_G) was 1.258, and the Normed Fit Index (NFI) was 0.735. Each of these values falls within the recommended thresholds, indicating that the model adequately fits the observed data [23]. Collectively, these results provide confidence in the structural model and support the suitability of testing the proposed hypotheses.
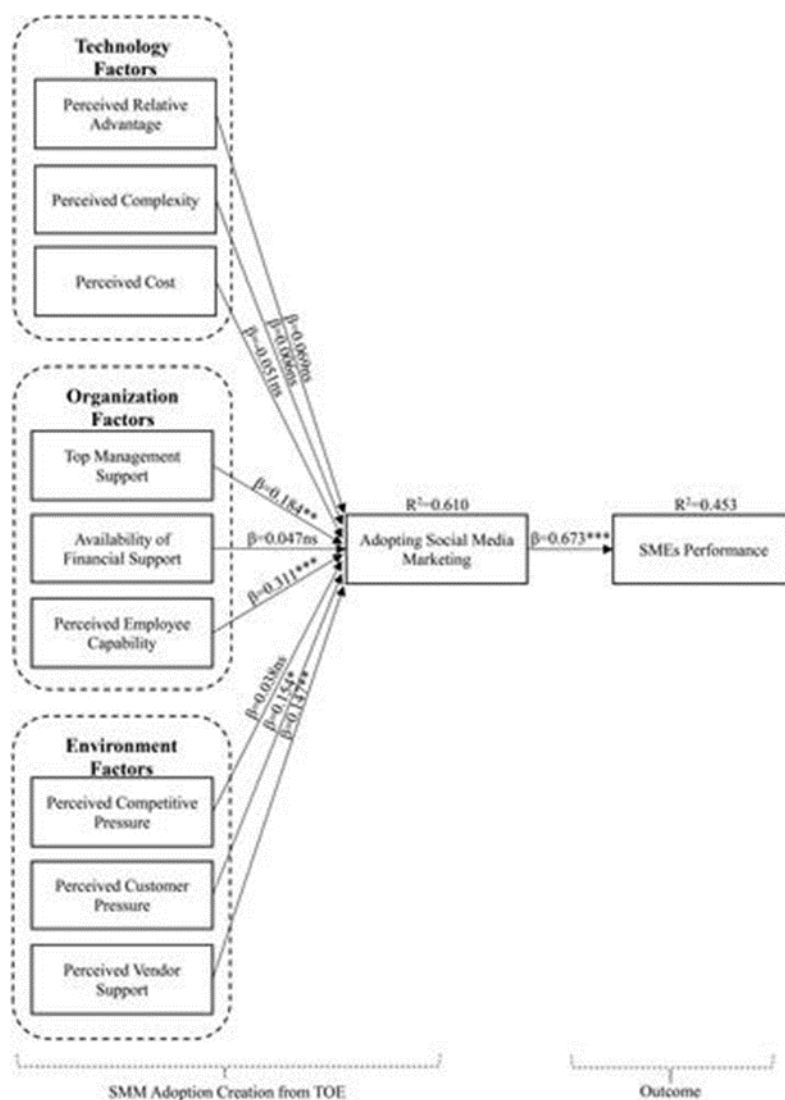
Figure 2. Summary of hypothesis testing visualized in graphics

This research determines the model's robustness by calculating the Goodness of Fit (GoF), which utilizes the formula: the square root of the product of communalities and Average Variance Extracted (AVE).

$$GoF = \sqrt{R^2 x \overline{AVE}}$$
$$= \sqrt{0.531 \; x \; 0.646}$$
$$GoF = 0.586$$

(1)

The study evaluated the model's predictive validity using established GoF benchmarks, which classify values below 0.1 as no fit, 0.10–0.25 as small fit, 0.25–0.36 as moderate fit, and values above 0.36 as high fit [27, 28]. The calculated GoF value for the model was 0.586, indicating a strong overall fit and demonstrating the robustness of the proposed conceptual framework.

Analysis of the structural model, presented in **Figure 2** and **Table 7**, revealed that the technology-related variables—perceived relative advantage, perceived complexity, and perceived cost—did not significantly influence SMEs' adoption of social media marketing. Specifically, their path coefficients were 0.069, 0.006, and –0.051, with corresponding t-values of 1.404, 0.122, and 1.014, suggesting that these technological perceptions were not decisive factors in the adoption process.

Organizational factors produced mixed outcomes. Top management support and perceived employee capability were both positively associated with social media adoption, with path coefficients of 0.184 and 0.311 and t-values of 2.899 and 5.042, confirming the importance of managerial encouragement and employee skills. In contrast, the availability of financial resources did not significantly impact adoption ($\beta = 0.047$, $t = 0.705$), indicating that budget availability alone may not drive SMEs toward embracing social media marketing.

Among environmental factors, customer expectations and vendor support emerged as significant drivers for social media adoption, with coefficients of 0.154 and 0.147 and t-values of 2.476 and 2.620. These results underscore the importance of

external pressures and collaborative support in motivating SMEs to adopt new marketing technologies. Conversely, competitive pressure did not significantly affect adoption ($\beta = 0.038$, t = 0.734), suggesting that the presence of competitors alone was insufficient to influence SMEs' decisions.

Finally, the adoption of social media marketing had a substantial positive impact on SMEs' performance, with a coefficient of 0.673 and a t-value of 17.730. This finding highlights that, while technological factors were less influential, organizational backing and environmental support are key to successful social media integration, which in turn enhances overall business performance.

Table 7. Summary of Hypothesis Testing.

Hypothesis	Path Coefficients	T-Value	P-Values	Conclusion
H1.a PRA→ASMM	0.069	1.404	0.160	Unsupported
H1.b PC→ASMM	0.006	0.122	0.903	Unsupported
H1.c PCT→ASMM	−0.051	1.014	0.311	Unsupported
H2.a TMS→ASMM	0.184**	2.899	0.004	Supported
H2.b AFS→ASMM	0.047	0.705	0.481	Unsupported
H2.c PEC→ASMM	0.311***	5.042	0.000	Supported
H3.a PCMP→ASMM	0.038	0.734	0.463	Unsupported
H3.b PCSP→ASMM	0.154*	2.476	0.013	Supported
H3.c PVS→ASMM	0.147**	2.620	0.009	Supported
H4 ASMM→SP	0.673***	17.730	0.000	Supported

Notes: Significance level.

***$P < 0.001$; **$P < 0.010$; *$P < 0.050$.

Discussion

Findings

This study examined the determinants of social media marketing adoption among SMEs within the TOE framework and assessed its impact on business performance. The results indicate that technological factors, including perceived relative advantage, perceived complexity, and perceived cost, did not exert a significant influence on SMEs' decisions to adopt social media marketing. This may be attributed to limited understanding of social media's potential benefits and constrained resources, which can obscure the perceived advantages of adoption. Perceived complexity did not emerge as a barrier, likely because SMEs prioritize customer engagement and visibility over technical challenges. Similarly, perceived cost did not significantly affect adoption, reflecting social media's cost-effectiveness and adaptability to SMEs' limited budgets. These findings align with prior research highlighting that technological perceptions alone are insufficient to drive adoption [1, 8].

Among organizational factors, top management support and perceived employee capability were found to positively and significantly influence social media marketing adoption. Strong managerial backing combined with skilled and knowledgeable employees encourages SMEs to embrace social media as a marketing tool. Conversely, the availability of financial resources did not significantly affect adoption, suggesting that social media's low cost relative to traditional marketing diminishes the influence of financial support. These results reinforce prior studies that emphasize the critical role of organizational readiness and human resources in technology adoption [8, 19].

Regarding environmental factors, customer pressure and vendor support were identified as significant motivators for SMEs to adopt social media marketing. Customer-driven demand encourages SMEs to maintain visibility and engagement, while vendor assistance—such as technical guidance and operational support—facilitates adoption. Competitive pressure, however, did not show a significant effect, implying that SMEs may base adoption decisions on internal strategies and customer relationships rather than the actions of competitors. Overall, the study highlights organizational and environmental factors as the primary drivers influencing SMEs' adoption of social media marketing.

Finally, the results demonstrate that adopting social media marketing significantly enhances SMEs' performance. Through these platforms, SMEs improve efficiency in addressing customer needs, broaden their reach, and innovate their marketing strategies. These improvements lead to increased customer engagement, optimized expenditures, and identification of new business opportunities, ultimately resulting in higher sales and overall performance. This finding supports prior research linking social media adoption to improved business outcomes [9].

Implications

Theoretical implications

The findings contribute to theory by extending the TOE framework in the context of social media adoption among SMEs. Social media is a customer-centric technology that has become a critical tool for business growth. Despite its importance, many SMEs lack guidance on how to effectively implement social media marketing. By integrating nine dimensions across

technological, organizational, and environmental factors, this study offers a detailed framework for understanding the adoption process and its impact on performance.

Specifically, organizational and environmental factors were found to have a greater influence than technological factors. Top management support and employee capability were instrumental in driving adoption, while customer pressure and vendor support reinforced SMEs' motivation to embrace social media marketing. Unlike previous studies that applied broader TOE constructs, this research identifies more specific determinants that provide actionable insights into social media adoption, thereby enriching theoretical understanding in innovation adoption and marketing management.

Furthermore, this study highlights social media marketing as a strategic tool for enhancing SMEs' performance. By adopting social media, SMEs can effectively identify customer needs, extend market reach, and implement innovative marketing strategies. This empirical evidence demonstrates that social media adoption serves as a practical approach to improving operational efficiency and competitive advantage, offering both theoretical insights and practical guidance for SMEs in the digital era.

Implications for SMEs

The findings of this study provide SME owners, managers, and executives with practical guidance on leveraging social media marketing to enhance business performance. Social media has emerged as a crucial tool for maintaining competitiveness, yet many SMEs lack a clear understanding of its potential benefits, optimal platform selection, and effective implementation strategies [8, 9]. This research clarifies the key factors influencing adoption and highlights the pathways through which social media can improve performance.

Although technological considerations such as perceived relative advantage, complexity, and cost did not significantly determine adoption, the desire to improve visibility and customer engagement drives SMEs to embrace these platforms. SMEs are encouraged to approach social media strategically, taking advantage of its cost-efficiency and broad reach to strengthen customer relationships and brand presence. This underscores the importance of building knowledge and awareness about social media's benefits, ensuring resources are allocated effectively to channels that provide measurable returns [1, 8].

Organizational factors play a critical role in successful adoption. The study demonstrates that top management support and employee capability are significant predictors, whereas financial support is less influential. This suggests that SME leaders should actively champion social media initiatives and integrate them into broader business strategies. Simultaneously, enhancing employees' skills through targeted training can improve the effectiveness of marketing campaigns. SMEs can thus achieve competitive advantages without large financial outlays, focusing instead on management endorsement and human capital development to maximize the impact of social media adoption.

From an environmental perspective, perceived customer pressure and vendor support significantly influence adoption, emphasizing a customer-focused approach. SMEs should engage proactively with customer feedback and preferences to strengthen their online presence, while leveraging vendor partnerships for technical and operational support. In contrast, competitive pressure appears less relevant, indicating that SMEs benefit more from cultivating a distinctive brand identity and loyal customer base rather than reacting to competitors.

Strategically, social media marketing enables SMEs to enhance performance by improving customer engagement, expanding market reach, and fostering innovation in marketing strategies. By prioritizing interactive, cost-effective, and data-driven approaches, SMEs can shift from traditional marketing to more dynamic, real-time engagement, ultimately increasing sales and overall performance [9]. This research encourages SMEs to integrate social media deeply into their business operations, ensuring sustained growth and competitiveness in the digital marketplace.

Conclusion, Limitations, and Future Research

This study demonstrates the practical value of the TOE framework in understanding social media marketing adoption within SMEs, offering meaningful contributions to the fields of vertical marketing and information management. Using SEM analysis, the research highlights that organizational factors—specifically top management support and perceived employee capability—alongside environmental factors, including perceived customer pressure and vendor support, play a crucial role in driving SMEs to adopt social media marketing. These findings underscore the strategic importance of social media adoption as a tool for improving business performance and competitive positioning [8, 9].

For SME managers, the results suggest the necessity of developing comprehensive social media strategies that integrate strong managerial backing and enhance employees' digital competencies. Furthermore, fostering active customer engagement and forming collaborative relationships with vendors can significantly strengthen the effectiveness of these strategies. Incorporating analytics-driven insights and tailoring marketing tactics to customer feedback can optimize social media campaigns and support overall business objectives [1, 9].

Despite these contributions, the study has several limitations. Technology-related factors, such as perceived relative advantage, complexity, and cost, showed a limited effect on adoption, indicating the need for further exploration to fully

understand their role in social media marketing adoption. Additionally, the focus on the pre-adoption phase restricts insights into the long-term effects on SME performance. Future research should consider examining both pre- and post-adoption stages to capture the complete trajectory of social media adoption and its impact on organizational outcomes [3]. Such longitudinal investigations could provide SMEs with a clearer roadmap for implementing social media strategies, enhancing competitiveness, and sustaining growth in both domestic and global markets.

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