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Advancing SME performance: a novel application of the technological-organizational-environment framework in social media marketing adoption

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ABSTRACT

This study advances the body of knowledge on social media utilization within Small and Medium-sized Enterprises (SMEs) by integrating complexity, cost, and capability into the Technology-Organization-Environment framework. It critically examines the influence of these factors on the adoption of social media marketing strategies to improve SMEs performance. Integrating these dimensions, this study elucidates their collective impact on SMEs' operational efficacy. We collected data from 508 Indonesian SMEs and employed Structural Equation Modeling to test our hypotheses. The results elucidate a discernible hesitancy among SMEs to adopt social media marketing strategies, primarily due to technological apprehensions concerning perceived advantage, complexity, and cost. Inversely, organizational influences such as top management support and perceived employee capability, alongside consumer and vendor pressure, are shown to significantly propel the adoption process. Importantly, the results confirm a substantial positive relationship between the strategic incorporation of social media marketing and the enhancement of SME performance. This research study makes a substantial contribution to the advancement of the TOE model as an effective solution for overcoming challenges faced by SMEs when embracing social media marketing and making impactful investments in digital marketing. By exploring the factors that shape social media marketing adoption in the context of SMEs, this study provides valuable insights for both industry practitioners and academic researchers.

IMPACT STATEMENT

In today's dynamic digital landscape, the successful adoption of social media marketing has become pivotal for the growth and sustainability of SMEs. However, despite its potential, the integration of these strategies among SMEs lags, impeding their performance and competitiveness. This study addresses this issue comprehensively. The research utilizes the TOE framework to investigate the factors influencing social media marketing adoption among SMEs and assess its impact on their performance. The findings highlight SMEs' challenges concerning technological factors, such as perceived relative advantage, complexity, and cost. On the other hand, organizational elements like top management support, perceived employee capability, and environmental aspects like perceived customer and vendor pressure have significant positive influences. By bridging the existing knowledge gap, this study provides practical guidance for SMEs, helping them leverage the benefits of social media marketing and enhance their performance.

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Introduction

The contemporary era of digitalization has significantly reshaped corporate practices by integrating modern technology to gain a competitive edge (Amoah et al., 2023). This transformation is in response to the highly dynamic market changes that impel businesses to adapt their marketing strategies. In order

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to confront these changes, industries, including SMEs, have embraced the use of social media as an essential tool (Patma et al., 2021). As disclosed by Suryani et al. (2021), approximately 30% of SMEs employ social media as a marketing instrument to facilitate their operational activities. The primary aim is to promote and communicate their value propositions to a broader customer base. SMEs perceive social media as a means to promote their products and services, expand market penetration, and foster connections with potential partners. Consequently, customers are encouraged to actively engage in online marketing activities and provide alternative solutions in their purchasing decision-making processes (Patma et al., 2021). Over the years, social media has evolved into a transformative social landscape, reshaping consumer behaviors and expectations. Recognizing its effectiveness, SMEs are increasingly motivated to adopt social media strategies to bolster their competitive advantage.

Prior research has established the applicability of integrating social media as an effective and efficient instrument for fostering sustainability within the context of SMEs (Amoah et al., 2023; Vrontis et al., 2022). Nonetheless, SMEs deal with challenges concerning financial resources, limited capabilities, and temporal constraints when contemplating the adoption of social media platforms. Notably, a comprehensive exploration of social media adoption within the specific framework of SMEs needs to be more conspicuously included in the existing body of literature. Consequently, a series of pertinent inquiries arise about SMEs' utilization of social media. These inquiries include the capacity of social media employment by SMEs to effectively cater to their customers' needs and expectations, the underlying factors motivating SMEs to embrace social media, the extent to which social media usage influences SMEs in their decision-making process regarding platform adoption, and the magnitude of the impact that social media adoption exerts on SMEs' performance. To date, extant scholarly investigations have not concentrated on the precise determinants of SMEs' decisions to adopt social media or their consequential effects on their performance. Consequently, a compelling necessity exists to undertake comprehensive research that explores more profound into the motivating factors that impel SMEs toward incorporating social media marketing and assesses the substantial effects it provokes on their overall performance.

The Technology-Organization-Environment (TOE) framework serves as the foundation of this study, including three principal predictors that influence the decision-making process of SMEs regarding the adoption of social media marketing. Tornatzky et al. (1990) work has conceptualized TOE as a model that embraces and implements technology, guided by technological, organizational, and environmental factors. As posited by Eze et al. (2021) and Qalati et al. (2022), these three TOE factors constitute the most effective and robust framework for SMEs in crafting consistent marketing strategies within their distinctive context. The TOE framework's dexterity lies in its adaptability in forecasting the levels of social media adoption in the business landscape. However, it is essential to note that the direct link between SMEs' adoption of social media marketing and the impact of TOE elements can vary depending on the organizational structure, the geographical setting of the study, and the type of technology employed (Ali Abbasi et al., 2022; Qalati et al., 2021). A significant gap exists in the availability of resources, organizational culture, communication capabilities, and environmental factors, all of which affect the relevance of TOE elements in the adoption of specific social media technologies. Thus, comprehending the determinants of social media marketing in SMEs necessitates a unique approach. Utilizing the TOE framework further fortifies this study with pragmatic flexibility to predict and interpret all-including facets of influencing factors in the context of SMEs' adoption of social media marketing. Prior research has merged the TOE framework with various models, including the Theory of Planned Behavior, the Technology Acceptance Model (TAM), and the Unified Theory of Acceptance and Use of Technology (UTAUT), within the SME domain (Ali Abbasi et al., 2022; Eze et al., 2021; Qalati et al., 2021). However, an empirical introspection into the precise determinants of social media adoption has yet to be explicitly conducted.

The scholarly investigation of social media technology within SMEs has significantly evolved, particularly through the application of the TOE framework. Abed (2020) instigated this scholarly conversation by elucidating the primary factors influencing the uptake of social commerce among SMEs in Saudi Arabia. This foundational research was furthered by the extensive works of Qalati et al. (2021) and Qalati et al. (2022), who broadened the scope of inquiry to include a diverse set of determinants, including the influence of entrepreneurial orientation and the exertion of competitive pressures on social media engagement. Complementing these attempts, Eze et al. (2021) provided a robust analytical instrument to navigate the complexities inherent in social media marketing for SMEs. Despite these comprehensive

explorations, the convolutions of the adoption process, specifically in terms of perceived complexity and the availability of financial support, remained underexplored (Ali Abbasi et al., 2022). Addressing this gaps, the current study proposes an integrated framework that holistically incorporating these elements, enhancing the conceptual clarity of the TOE framework's influence on SMEs' decision-making processes in the domain of social media marketing.

This study excels theoretical enrichment to proffer empirical insights with significant pragmatic consequences. In addressing the pressing research question (R.Q1): *'What motivates SMEs to adopt social media marketing?'* it critically dissects the interconnected TOE factors. This inquiry is pivotal, as it amplifies the theoretical narrative, providing a pragmatic compilation for SME managers to effectively synchronize digital marketing investments with validated research outcomes (Ali Abbasi et al., 2022). Subsequently, this study probes to elucidate on *how the impact of social media marketing implementation on SME performance* (R.Q2), aiming to elucidate the dynamics of innovative marketing strategies and their correlation with enhanced business performance. Advancing the discourse, this research integrates previously marginalized factors within the TOE framework—specifically perceived employee capability and vendor support. This not only augments the theoretical landscape but also illumines the essential human and relational dimensions that significantly influence technology adoption within SMEs. The in-depth analysis presented herein widens the TOE framework and, crucially, equips stakeholders in developing economies with a sophisticated comprehension of the mechanisms governing social media marketing adoption. This enriched understanding is poised to guide informed strategic and policy development, targeting the enhancement of SME performance within the digital global marketplace (Ali Abbasi et al., 2022).

The contributions of this research are deepens the theoretical underpinnings of the TOE framework and proffers actionable insights for industry practitioners. By incorporating underrepresented yet critical TOE dimensions, this study provides a granular view of the social media marketing adoption process. This academic enrichment is coupled with practical utility, offering a foundational pillar for SMEs to enhance their marketing effectiveness and, ultimately, their overall performance. Therefore, this research not only contributes to the academic advancement of the TOE model but also delineates an effective paradigm for addressing the multifaceted challenges that SMEs face in implementing social media marketing strategies and improving performance within the digital domain (Ali Abbasi et al., 2022).

Literature review and hypothesis

Related studies

In recent studies, the TOE framework has been a pivotal lens through which the adoption of social media by SMEs has been examined and shown in Table 1. Abed (2020) made significant advances by identifying crucial technological and environmental factors, such as security concerns and trading partner pressure, that drive social commerce adoption among Saudi Arabian SMEs. Similarly, Qalati et al. (2021) provided a comprehensive model that incorporates a broad spectrum of determinants including cost-effectiveness, visibility, and competitive pressures, enhancing the understanding of social media uptake in SMEs. Eze et al. (2021) further contributed by pinpointing challenges in the adoption process and offering a reliable analytical framework. However, these studies often focus on isolated aspects of the TOE framework and may not fully explore the interplay between these dimensions.

This study aims to fill the gaps in the current literature by integrating a wider array of factors across the technological, organizational, and environmental dimensions to construct an all-inclusive framework. Building upon the work of Qalati et al. (2022), which highlighted the significance of entrepreneurial orientation and competitive pressures, our research introduces additional variables such as perceived complexity and availability to financial support, which have been underexplored in prior research. By examining the relationships between these factors and their collective impact on social media adoption and SME performance, this study not only extends the TOE framework but also provides a more rough understanding of the adoption process which affects the SMEs performance. This approach offers theoretical contributions by unveiling the influence of perceived employee capability and vendor support, thus equipping decision-makers with an involved tool for navigating the complexities of social media marketing technology adoption in developing countries.

Table 1. Related Studies on SMEs and TOE Framework.

Authors	TOE Dimensions	Contributions
Abed (2020)	Perceived Usefulness (T) Security Concern (T) Top Management Support (O) Organizational Readiness (O) Consumer Pressure (E) Trading Partner Pressure (E)	The study enriches social commerce literature by empirically unveiling the key drivers of its adoption among Saudi Arabian SMEs.
Qalati et al. (2021)	Relative Advantage (T) Cost-Effectiveness (T) Compatability (T) Interactivity (T) Visibility (T) Top Management Support (O) Competitive Intensity (E) Competitive Pressure (E) Bandwagon Effect (E)	This paper advances the understanding of social media adoption in SMEs with an empirical model exploring multiple determinants of its uptake.
Eze et al. (2021)	Compatability (T) Affordability (T) Users' Acceptance Information (O) Efficiency Driven (O) Owner's Support (O) Competitor's Intelligence Gathering (E) Customer's Information Gatheting (E) Provider Credibility (E)	The study augments the TOE framework with insights into SMEs' challenges in adopting social media marketing, offering a reliable analytical tool for understanding this issue.
Qalati et al. (2022)	Relative Advantage (T) Cost-Effectiveness (T) Compatability (T) Interactivity (T) Top Management Support (O) Entrepreneurial Orientation (O) Consumer Pressure (E) Competitor Pressure (E)	The study highlights key technological, organizational, and environmental factors impacting SMEs' social media adoption and performance, presenting a novel framework with implications for various stakeholders.
This study	Perceived Relative Advantage (T) Perceived Complexity (T) Perceived Cost (T) Top Management Support (O) Availability to Financial Support (O) Perceived Employee Capability (O) Perceived Competitive Pressure (E) Perceived Customer Pressure (E) Perceived Vendor Support (E)	This study enhances the TOE framework by incorporating underexplored factors like perceived complexity and financial support, advancing the understanding of social media adoption in SMEs. It also provides practical insights by revealing the impact of employee capability and vendor support on SME performance in developing countries.

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

SMEs performance

In the fiercely competitive landscape, every SME strives to achieve optimal performance. SMEs' performance is defined as their ability to attain specific goals through a series of activities (Ramdan et al., 2022), with a particular focus on marketing activities that drive SMEs' performance (Ali Abbasi et al., 2022). Previous research has investigated various determinants of SMEs' performance, albeit often focusing on specific variables that have the potential to influence SMEs' performance (Ipinnaiye et al., 2017; Ndiaye et al., 2018). Few studies have delved into how internal and external determinants collectively impact business performance (Ipinnaiye et al., 2017). Hence, there is a need for a more comprehensive examination of the determinants driving SMEs' performance. To address this challenge, this study aims to develop an evidence-based understanding of the factors influencing SMEs' performance. Therefore, the research employs the TOE model to identify the determinants of adopting social media marketing as their primary strategy, which, in turn, drives SMEs' performance in Indonesia.

Technology-Organization-environment (TOE) framework

Originating from the realm of organizational psychology, the TOE framework provides a tripartite analytical perspective for understanding the adoption of technological innovation within organizations. Introduced by Tornatzky et al. (1990) in 1990, the framework identifies three critical influences:

technological, organizational, and environmental. The technological aspect denotes the suite of capabilities an organization wields to adopt and implement novel technologies. In parallel, the organizational aspect encapsulates the breadth and depth of an organization's attributes, including its scale and the strategic allocation of its resources. The environmental aspect places the organization in the broader context of market trends, competitive forces, and policy frameworks that may impact its operational dynamics (Baker, 2012). The TOE framework has proven to be an insightful tool, applied to an array of fields such as tourism (Wang et al., 2016) and e-commerce (Orji et al., 2022), highlighting its broad utility and the significance of its contributory dimensions.

The integration of the TOE framework within the scope of social media marketing, particularly for SMEs, has garnered empirical support for its robust explanatory power (Eze et al., 2021). The research of Ali Abbasi et al. (2022) underscores the framework's capacity to elucidate the comprehensive array of factors influencing SMEs' strategic decisions regarding social media adoption. Notably, the technology factor has emerged as a dominant motivator, potentially overshadowing organizational and environmental factors in its influence (Qalati et al., 2021). Yet, research by Pateli et al. (2020) presents a divergent view, suggesting organizational elements may take precedence. The challenges inherent in adopting social media marketing, such as limited resources and communication barriers faced by SMEs, underscore the framework's relevance and analytical value (Qalati et al., 2021). This research thus adopts the TOE framework as a holistic model to critically assess the nexus of technological, organizational, and environmental factors shaping social media marketing adoption in the SME context.

Employing the TOE framework, this study meticulously scrutinizes the determinants shaping social media marketing adoption among SMEs. In line with the delineation provided by Ali Abbasi et al. (2022), the investigation encompasses a spectrum of factors: from the perceived technological advantages and barriers, through the organizational readiness and support, to the environmental pressures and supports. These factors, collectively verified through empirical research and theoretical discourse, construct a robust framework that informs and streamlines the process of social media marketing adoption for SMEs. Thus, the TOE framework serves as both a beacon for academic inquiry and a pragmatic guide for SMEs navigating the complexities of the contemporary digital marketing landscape.

Technology factor

The increasing advancements in digital performance bring about significant changes for SMEs (Qalati et al., 2021). The technology factor plays a pivotal role in shaping these transformations (Eze et al., 2021). The technology factor pertains to both internal and external capabilities to implement social media marketing (Ali Abbasi et al., 2022). Experiences gained, whether internally or externally, regarding technology, encourage SMEs to perceive innovation changes positively (Eze et al., 2021). Previous research has explored perceived relative advantage, perceived complexity, and perceived cost as key dimensions of the technology factor that drive SMEs to adopt social media marketing. The first dimension, perceived relative advantage (Ali Abbasi et al., 2022; Qalati et al., 2022), depicts how far SMEs view technological innovation as providing a better value compared to available alternatives (Ali Abbasi et al., 2022; Qalati et al., 2022). Considered in terms of operational cost savings, information accessibility, broad audience reach, and interactive customer engagement, it tends to offer superior benefits (Pateli et al., 2020). Therefore, perceived relative advantage stands as a robust predictor driving SMEs' decisions to adopt social media marketing (Ali Abbasi et al., 2022; Qalati et al., 2022). Accordingly, the following hypotheses are proposed.

H1a. When SMEs employ technology with an increasing perceived relative advantage, they are more likely to adopt social media marketing

Perceived complexity is a consideration for SMEs when adopting social media marketing (Ali Abbasi et al., 2022). This refers to the extent of complexity or difficulty perceived in using new technology (Amoah et al., 2023+). The majority of SMEs view the use of social media as highly intricate in terms of technology implementation and management (Ali Abbasi et al., 2022). Given that an increase in perceived complexity triggers barriers to the adoption and ineffective management of social media

processes, it tends to pose difficulties for SMEs (Amoah et al., 2023). Therefore, the following hypothesis is formulated.

H1b. The higher the perceived complexity when SMEs use technology, the more challenging it becomes to adopt social media marketing

The consideration of investment costs, as seen in the availability of a substantial budget, also poses a challenge for SMEs (Patma et al., 2021). This budget covers expenses related to new technology, paid advertising, and the skills of employees in using the technology (Patma et al., 2021). The need for a larger budget represents a significant barrier, especially when the expected profits for SMEs remain uncertain (Ali Abbasi et al., 2022). Ali Abbasi et al. (2022) also highlight that perceived cost, coupled with a lack of financial support and inadequately skilled employees, makes it difficult for SMEs to adopt social media marketing. Therefore, the following hypothesis is formulated.

H1c. The higher the perceived cost when SMEs use technology, the more challenging it becomes to adopt social media marketing

Organization factor

The organization factor focuses on the resources shaping social media marketing technology for SMEs (Eze et al., 2021). This factor comprises two aspects: business characteristics (business size, managerial structure) and resources (employee capabilities, financial resources) (Maduku et al., 2016). According to Ali Abbasi et al. (2022), the organizational factor includes top management support, availability of financial support, and perceived employee capability, playing a crucial role as drivers for SMEs to adopt social media marketing. Building upon this, the study adopts these three dimensions to create an impact on adoption for SMEs.

Top management support is responsible for providing assistance such as resource provision and creating a conducive atmosphere to encourage the adoption process (Ali Abbasi et al., 2022). When SMEs aim to adopt social media marketing, strategic decisions and resource allocation revolve around the role of top management (Qalati et al., 2022). With a strong understanding of the potential of social media marketing, top management tends to provide resource support for innovation adoption (Eze et al., 2021). The support provided by top management translates positively to all employees (Ali Abbasi et al., 2022). Furthermore, creating a supportive environment further motivates the process of adopting social media marketing (Pateli et al., 2020). Hence, top management support is a crucial pillar for building and implementing the adoption of social media marketing in SMEs (Ali Abbasi et al., 2022; Qalati et al., 2022). Therefore, the research posits the following hypothesis:

H2a. When SMEs use technology with substantial top management support, they are more inclined to adopt social media marketing

The availability of financial resources is the primary determinant of the decision-making process for the adoption of social media marketing (Ali Abbasi et al., 2022; Amoah et al., 2023). Budget constraints present complex challenges for SMEs in adopting technology (Chatterjee et al., 2021). Given the substantial financial investment required for adopting social media marketing, precise budget allocation is necessary (Amoah et al., 2023). With the availability of financial support, SMEs can overcome the challenges of limited financial resources (Ali Abbasi et al., 2022; Amoah et al., 2023). Referred to as organizational slack, this represents the readiness of financial resources to support the overall resources of SMEs (human and technical resources) (Ali Abbasi et al., 2022). The availability of adequate financial support with proper allocation further motivates SMEs to adopt social media marketing (Amoah et al., 2023). Therefore, the research posits the following hypothesis:

H2b. The higher the perceived availability of financial support when SMEs use technology, the more likely they are to adopt social media marketing

A high level of skill, knowledge, and competence among employees, as perceived in employed capability, facilitates SMEs in the process of adopting new technology (Ahmad et al., 2018). Conversely, low employee skills and knowledge tend to hinder technology adoption in SMEs. Additionally, the significant

additional costs of adopting new technology need to balance technology innovation capabilities with employee competencies (Ali Abbasi et al., 2022). Amoah et al. (2023) asserts that employees willing to learn to enhance their capacity can motivate SMEs to adopt new technology. Even confident and competent employees using social media help SMEs implement effective social media marketing (Ahmad et al., 2018; Amoah et al., 2023). Therefore, the research posits the following hypothesis:

H2c. When SMEs use technology with an increasing perceived employed capability, they are more inclined to adopt social media marketing

Environment factor

Elements of the internal (management) and external (customers, competitors, and government) environment that shape the adoption of social media are known as the environment factor (Eze et al., 2021). Several previous studies have broadly explored elements related to the environmental factor in SMEs (Qalati et al., 2022). Ali Abbasi et al. (2022) stated that perceived competitive pressure, perceived customer pressure, and perceived vendor support significantly impact the process of adopting social media marketing. Based on these findings, this study adopts these three dimensions to further investigate the environment factor in determining adoption in SMEs.

The determinant of adoption focusing on the level of pressure exerted by the external environment is considered as perceived competitive pressure (Collado-Agudo et al., 2023). The drive to adopt social media arises from the perceived pressure from external competitors in the same industry. The presence of a threat to lose profits for SMEs and the technological innovation advancement held by competitors compared to SMEs (Ali Abbasi et al., 2022). Due to the high pressure exerted by competitors, SMEs become more active in expanding their market reach through the adoption of social media marketing. This decision to adopt brings many benefits, leading to a competitive advantage and even market dominance on a global scale (Ali Abbasi et al., 2022). Therefore, the study proposes the following hypothesis:

H3a. The higher the perceived competitive pressure when SMEs use technology, the more likely they are to adopt social media marketing

Perceived customer pressure encompasses various forms of pressure directed towards meeting the changing needs and expectations of customers (Amoah et al., 2023; Qalati et al., 2022). These evolving needs are closely aligned with technological advancements, rendering customers increasingly informed and interactive (Qalati et al., 2022). This dynamic exerts a notable influence on the decisions made by SMEs regarding the adoption of social media as a medium for communication and marketing that aligns with customer expectations. Previous research also highlights the pivotal role of perceived customer pressure as a motivating factor for SMEs in adopting social media marketing (Ali Abbasi et al., 2022; Amoah et al., 2023). Therefore, the study advances the following hypotheses:

H3b. The greater the perceived customer pressure experienced by SMEs when utilizing technology, the more disposed they are to adopt social media marketing

On the other hand, vendor policies play a role in strengthening SMEs' decisions to adopt social media marketing (Ali Abbasi et al., 2022). This can be seen in the technical assistance and training provided by vendors, which can mitigate technology-related risks. An increase in vendor support, positively impacting SMEs, further motivates them to adopt technology (Ali Abbasi et al., 2022). Therefore, this study proposes the following hypothesis:

H3c. When SMEs use technology with an increasing perception of vendor support, they tend to adopt social media marketing

Social media marketing adoption

Social media has become a new and strategic trend for all economic sectors, particularly for SMEs (Patma et al., 2021). Interactive communication platforms that support the development and wide dissemination of information through online channels, such as Facebook, Twitter, Instagram, and other media, are collectively referred to as social media marketing (Amoah et al., 2023; Eze et al., 2021). This innovative tool

is strategically employed for information sharing and long-term relationship building with customers, making it a prevalent form of marketing adopted by SMEs (Amoah et al., 2023; Chatterjee et al., 2021). Therefore, Trawnih et al. (2021) asserts that the adoption of social media by SMEs during crises can also aid in company survival since these platforms can facilitate closer engagement with consumers and the supply chain while reducing costs. Through this adoption, SMEs can engage in two-way communication with customers and interact with each other (Chatterjee et al., 2021). Considering SMEs' resource constraints and limited technical capabilities regarding new technologies, social media marketing overcomes these limitations and provides benefits that contribute to the enhancement of their business activities (Chatterjee et al., 2021). Patma et al. (2021) and Amoah et al. (2023) have identified several benefits for SMEs, including knowledge and information sharing, cost-effectiveness, increased sales, customer awareness, and even efficiency in product or service creation for customers. These technological innovations' benefits are transforming how SMEs interact with their customers and other stakeholders (Qalati et al., 2021). Moreover, Ahmad et al. (2018) and Qalati et al. (2021) found that the adoption of social media marketing results in an enhancement of SMEs' performance. This adoption is only feasible when SMEs utilize the TOE driving factors to adopt and assimilate new technologies (Qalati et al., 2022). Consequently, this research proposes the following hypotheses:

H4. SMEs that adopt social media marketing are likely to enhance SMEs' performance

Research model

This research model is developed based on previous research findings. The antecedents of the study are grounded in the TOE model originally proposed by Tornatzky et al. (1990). The TOE framework including three dimensions: technology factors, organization factors, and environment factors, in line with prior studies (Ali Abbasi et al., 2022; Eze et al., 2021). This study's theoretical framework represents a novel innovation from preceding studies by Abed (2020), Qalati et al. (2021), Eze et al. (2021), and Qalati et al. (2022), by integrating complexity, cost, and relative advantage as technological factors. It further incorporates employee capability and access to financial support as organizational factors, while market pressures—such as consumer, vendor, and competitive forces—epitomize the environmental factors.

The TOE framework has provided empirical evidence, contributing to an understanding of how the contextual factors of technology, organization, and environment impact the adoption and implementation of new technologies, particularly in the context of social media marketing, within SMEs. The factors from the TOE model play a pivotal role in social media marketing adoption, ultimately exerting a significant influence on SMEs' performance as the research outcome. Figure 1 illustrates a comprehensive and developed conceptual framework for this study, highlighting the interplay between technology, organization, environment, and their impact on social media marketing adoption and SMEs' performance. This model forms the foundation for the hypotheses and the subsequent investigation presented in the study.

Methods

Research context

Social media has become a strategic and innovative marketing tool for SMEs to gain a competitive advantage (Amoah et al., 2023). At this juncture, social media has transformed into a powerful medium that delivers significant results for SMEs' business growth and development, as acknowledged by both academics and practitioners (Ali Abbasi et al., 2022). Despite its potential, SMEs face practical challenges in the implementation of social media marketing, particularly among those in the early stages and lagging behind. These challenges encompass financial resources, limited resources, and time constraints, all of which influence SMEs' decisions to adopt technology and impact their performance (Amoah et al., 2023; Suryani et al., 2021). To address these gaps, SMEs require innovative approaches to enhance their performance by effectively adopting social media marketing strategies. This research aims to bridge the divide by investigating the factors influencing the adoption of social media marketing using the TOE framework to enhance SMEs' performance. The study adopts the TOE model, emphasizing three key factors based on technology factors (perceived relative advantage, perceived complexity,

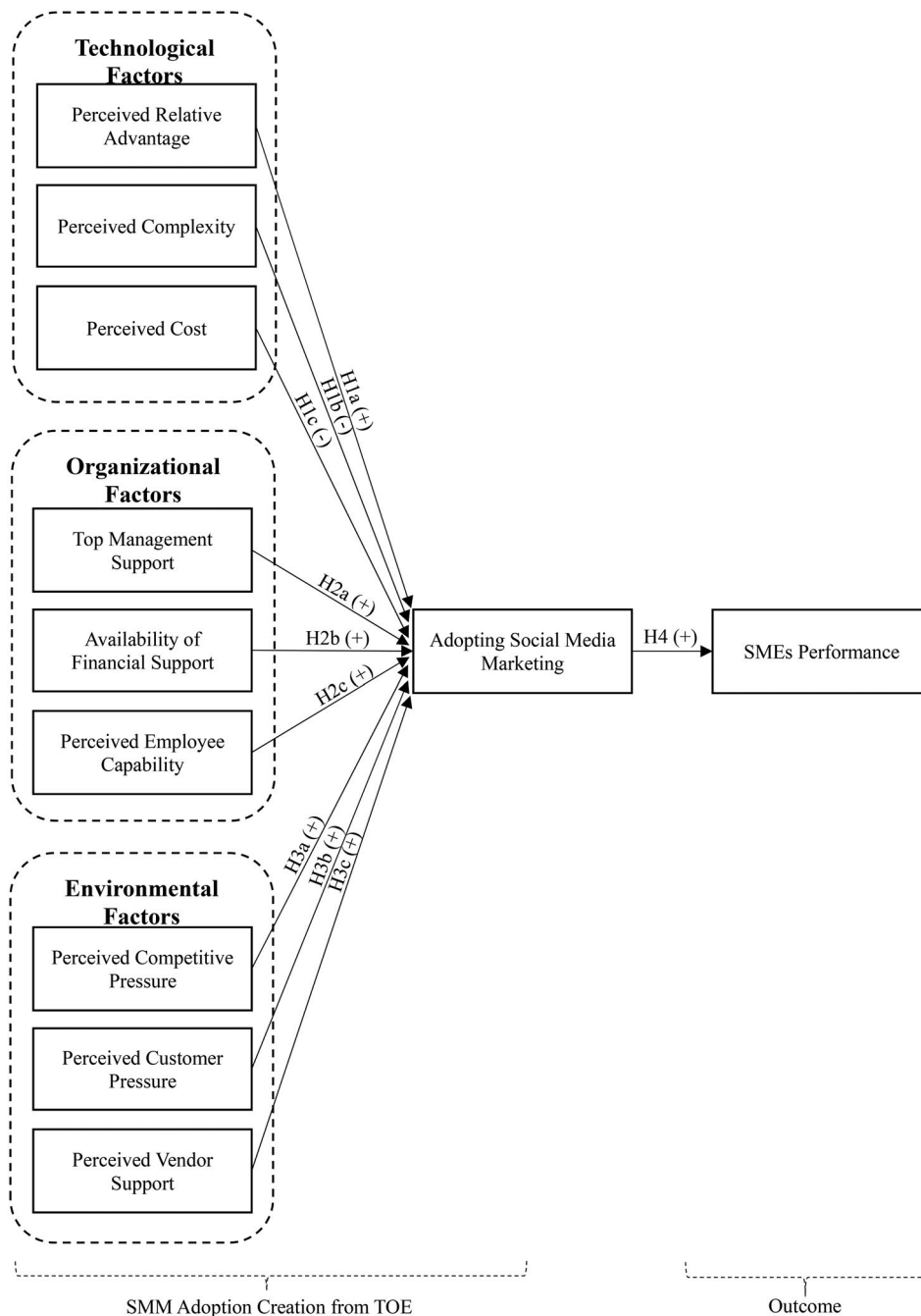


Figure 1. Proposed conceptual model predicting SMEs performance.

and perceived cost); organization factors (top management support, availability of financial support, and perceived employee capability); and environment factors (perceived competitive pressure, perceived customer pressure, and perceived vendor support) concerning the decision to adopt social media marketing for SMEs (Ali Abbasi et al., 2022; Eze et al., 2021). Subsequently, the research underscores how the adoption of social media marketing yields a positive impact that correlates with SMEs' performance. Therefore, this study aims to comprehensively explore this specific domain based on rigorous scientific procedures.

Operationalization

This study discusses how variables are defined and measured, which is represented in the operationalization section of the research. Several constructs to be observed include Technology factor (perceived

relative advantage, perceived complexity, and perceived cost), organization factor (top management support, availability of financial support, and perceived employee capability), and environment factor (perceived competitive pressure, perceived customer pressure, and perceived vendor support) as presented in [Appendix Table A](#). The following is the presentation of the research operationalization.

A. Perceived relative advantage

As described by Ali Abbasi et al. (2022), perceived relative advantage is depicted as a characteristic that enhances the value of a product or service, as seen from the perspective of both customers and businesses. Drawing from Ali Abbasi et al. (2022) definition and extending it to align with the context of this study, perceived relative advantage pertains to the extent to which prospective adopters view social media marketing as an innovation that offers greater benefits, thereby enhancing the value of the product or service compared to available alternatives. Perceived relative advantage is quantified using a 7-point Likert scale ranging from (7) strongly agree to (1) strongly disagree.

B. Perceived complexity

Amoah et al. (2023) provides a definition of perceived complexity, referring to the degree to which new technology depends on its intricacy and the difficulty of its usage. In the context of this research, this definition is refined to signify the perceived level of complexity that prospective adopters associate with the implementation and utilization of social media marketing. The measurement of perceived complexity is conducted through a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

C. Perceived cost

Maduku et al. (2016) define perceived cost as the expenses entailed in the implementation of technological innovation. This study conceptualizes this definition to signify the perceived cost by potential adopters to receive and utilize social media marketing as an innovation that facilitates direct interaction with customers or businesses. Perceived cost is assessed using a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

D. Top management support

Ali Abbasi et al. (2022) define top management support as the resources available to managers as a strategic approach. This study adapts the definition of top management support, focusing on the role of the primary coordinator who provides enthusiastic support, including the availability and coordination of all resources allocated to various departments to drive the adoption process. Top management support is quantified using a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

E. Availability of financial support

Ali Abbasi et al. (2022) provided a definition for top management support as resources available to managers as a strategic approach. In this study, the definition of top management support is adapted to focus on the key coordinating role that provides enthusiastic support, including the availability and coordination of all resources channeled to all departments to drive the adoption process. Top management support is assessed using a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

F. Perceived employee capability

Ali Abbasi et al. (2022) provided a definition for perceived employee capability as the presence of specialized human resources handling the technology adoption process. Building upon Ali Abbasi et al.'s definition and extending it to the context of this study, perceived employee capability focuses on the skills and competencies of employees that facilitate the adoption process of social media marketing. Perceived employee capability is assessed using a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

G. Perceived competitive pressure

Ali Abbasi et al. (2022) provide a definition for perceived competitive pressure as the pressure imposed by external competitors within the same industry. In the context of this study, we adapt this definition

to conceptualize perceived competitive pressure as the extent of pressure perceived by SMEs from external competitors, which serves as a determining factor for opportunities in adopting social media marketing. Perceived competitive pressure is evaluated through a 7-point Likert scale, with responses ranging from (7) strongly agree to (1) strongly disagree.

H. Perceived customer pressure

Qalati et al. (2022) defines perceived customer pressure as encompassing various types of pressure centered around and driven by customers to meet their demands. In this study, we adapt the definition of perceived customer pressure to focus on the pressure created by customers to meet the changing needs and expectations shaped by the customers themselves in the adoption of social media marketing. Perceived customer pressure is measured using a 7-point Likert scale, with responses ranging from (7) strongly agree to (1) strongly disagree.

I. Perceived vendor pressure. Ali Abbasi et al. (2022) defines perceived vendor pressure as referring to vendor marketing policies that influence the decision to adopt a technology. In the context of this study, the definition of perceived vendor pressure is further expanded to encompass vendor policies that include technical assistance and training to mitigate risks and strengthen the decision to adopt social media marketing (Ali Abbasi et al., 2022). Perceived vendor pressure is measured using a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

J. Social media marketing adoption

Ali Abbasi et al. (2022) defines adopting social media marketing as a dialogue triggered by customers or businesses by propelling communication that reveals information for the benefit of all parties involved. In the context of this study, the definition of adopting social media marketing is adapted to focus on an innovative and interactive communication model that supports the development and dissemination of information regarding products/services. This enables SMEs to connect with customers anytime and anywhere in marketing activities. Adopting social media marketing is assessed using a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

K. SMEs performance

According to Qalati et al. (2021), SMEs performance refers to every effort made by SMEs to achieve their best performance. Building upon this definition and adapting it to the context of this study, SMEs performance can be conceptualized as the ability of SMEs demonstrated through a series of activities aimed at reaching their goals and achieving their best performance. SMEs performance is measured using a 7-point Likert scale, ranging from (7) strongly agree to (1) strongly disagree.

Sampling and data collection procedure

Nonprobability sampling techniques and purposive sampling methods were employed to select participants for this research. Participants were chosen from SMEs utilizing social media in their marketing strategies. Participants were considered eligible to complete the questionnaire if they met the required characteristics to yield responses relevant to the research objectives (Huang et al., 2022, 2024). The research commenced its data collection process after receiving approval, from the Ethical Review Board of the College of Management at Chaoyang University of Technology. Data was gathered through a survey tool created on Google Forms, which included items tailored for this study. The initial part of the survey requested participants to give consent before proceeding with the questionnaire. Once consent was given respondents were asked to provide information, about their SMEs ownership status, employee count and other relevant corporate details. The third section of the questionnaire consisted of research questions designed specifically for this investigation. Participants were required to share their perceptions and experiences related to each research item in their responses. The Google Forms link was distributed via social media platforms (Facebook, Instagram, and WhatsApp) randomly. Data collection took place over a two-month period, resulting in 508 responses. This number satisfies the minimum sample

size requirement for data analysis using the 10 times rule ($10 \times n$), where n represents the total number of indicators (Hair et al., 2011; Kock & Hadaya, 2018), thereby establishing the minimum sample size at 450. The data collection procedure in this research followed the same approach as a previous study (Shih et al., 2024; Silaban et al., 2023).

Analysis technique

The SEM approach using Smart-PLS 4.0 in this research consists of several stages. The application of SmartPLS in this study allows for the use of a bootstrapping technique that provides a robust non-parametric method of inference, which is ideal for our research design featuring complex model structures. First, the measurement model stage was conducted, which involved validity and reliability tests, including convergent and discriminant validity. Convergent validity assessment was based on three metrics: Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha (CA) for internal consistency (Hair et al., 2017). Furthermore, discriminant validity was evaluated using criteria such as Fornell-Larcker, Heterotrait-Monotrait (HTMT), and cross-loading matrices (Fornell & Larcker, 1981; Henseler et al., 2015). Second, the structural model stage was based on values such as R-square and model fit. The R-square value is determined by the exogenous variable factors to measure the model's performance strength (Falk & Miller, 1992). Model fit criteria such as SRMR, d_ULS , d_G , and NFI were evaluated (Hu & Bentler, 1998). After ensuring that the SEM model fit criteria were met, hypothesis testing was conducted.

Results

Sample profile

This research successfully collected 508 valid responses over two months of data collection. The demographic composition of the study participants is as follows: concerning their roles within SMEs, business owners constituted the majority (52%) of the sample, followed by employees (30.3%). Regarding the number of employees within SMEs, the majority of participants had up to 300 million (76.4%). Regarding the annual sales revenue of SMEs, most respondents were associated with businesses generating earnings ranging from 300 million to 2.5 billion (20.3%). These earnings classifications were prevalent in the trade, hotel, and restaurant sectors (41.1%), with the service sector (21.3%) following closely. Concerning social media utilization, most respondents exhibited either moderate (39.8%) or extensive (29.3%) usage. Concerning the frequency of SMEs' social media use, a substantial portion of the participants reported frequent utilization (41.3%), followed by extensive usage (24.6%). This pattern was confirmed by the prominence of Instagram (44.3%) as SMEs' most widely used social media platform. The detailed profiles of the sample are presented in Table 2.

Common method variance (CMV)

The study initiated the assessment of Common Method Variance (CMV). Harman's Single Factor analysis was employed to ascertain the consistency of each participant's responses to all the items used in the research (Baumgartner et al., 2021). This was achieved by analyzing the loading of all items onto a single factor. The results revealed a CMV value of 16.3%, indicating that common method variance is not a major concern, as all values are below the 50% threshold (Baumgartner et al., 2021).

Validity and Reliability assessment

The study commenced with an assessment of validity and reliability. The results of the convergent validity testing indicated that the overall outer loading values exceeded the 0.70 threshold (Hair et al., 2017). Additionally, the values for Cronbach's Alpha (CA) and Composite Reliability (CR) demonstrated that the data exhibited strong internal consistency and validity since each value exceeded 0.70, signifying satisfactory reliability (Hair et al., 2017). On the other hand, the AVE values exceeded 0.50, indicating satisfactory convergent validity (Hair et al., 2017). Table 3 summarizes the results of convergent validity and internal consistency.

Table 2. Sample Profile.

Measure	Items	Frequency	(%)
Position in the business	Owners	264	52
	Managers	90	17.7
	Employee	154	30.3
The number of employee	1–5	315	62
	6–19	146	28.7
	20–99	47	9.3
Annual revenue	≤300 Million	388	76.4
	300 Million to 2.5 Billion	103	20.3
	2.5 Billion to 50 Billion	17	3.3
Sektor bisnis SMEs	Agriculture	55	10.8
	Stockbreeding	35	6.9
	Silviculture	6	1.2
	Fishery	6	1.2
	Mining and excavation	14	2.8
	Industry and processing	35	6.9
	Electricity, gas and clean water	11	2.2
	Construction	7	1.4
	Trade, hotels and restaurants	209	41.1
	Transport and communications	6	1.2
	Finance, rental and corporate services	16	3.1
	Service bureau	108	21.3
Level of social media utilization	Minimum	79	15.6
	Basic	78	15.4
	Moderate	202	39.8
	Extensive	149	29.3
Frequency of SMEs businesses using social media	Minimum	81	15.9
	Small	92	18.1
	Many	210	41.3
	Extensive	125	24.6
Social media platforms used	Facebook	106	20.9
	Twitter	15	3
	LinkedIn	5	1
	WhatsApp	88	17.3
	YouTube	10	2
	Instagram	225	44.3
	Tik-Tok	52	10.2
	Telegram	5	1
	Line	2	0.4

Discriminant validity

To assess discriminant validity, three approaches were used in this study. First, the Fornell-Larcker test showed that the square root of AVE (values bolded along the diagonal) was higher than the inter-construct correlations (Fornell & Larcker, 1981). Table 4 reveals that discriminant validity is satisfactory based on the Fornell-Larcker criterion. Second, the heterotrait-monotrait ratio (HTMT) method demonstrated that all HTMT values were below the threshold of <0.95 (Henseler et al., 2015). The HTMT values in Table 5 indicate that the data used to test the research model is robust. Third, the cross-loading matrix approach was used to test the strength of items from one construct compared to items from other constructs (Hair et al., 2017). Table 6 shows that all constructs have stronger loadings on their respective items compared to items from other constructs. Subsequently, we have also assessed multicollinearity through the Variance Inflation Factor (VIF) approach. The results indicate that all VIF values are below 3 as suggested by Hair et al. (2017), suggesting that multicollinearity is not present in this study. Thus, it can be concluded that each construct is discriminantly valid, contributing to a well-assessed measurement model toward hypothesis formulation.

Hypothesis testing

This study conducted an evaluation of the structural model using Structural Equation Modeling (SEM) with Smart-PLS 4.0 software aimed at assessing the model's validity in testing hypotheses (Falk & Miller, 1992). This evaluation consisted of several stages. First, determining the R-squared (R^2) values of each endogenous construct, with an R^2 value exceeding 0.1 or approaching 1 considered satisfactory (Falk & Miller, 1992). Findings in Figure 2 indicate that the construct 'adopting social media marketing' has an R^2

Table 3. Validity and Reliability.

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.

value of 0.610, explained by the path coefficients of ‘factor technology factors’ (perceived relative advantage, perceived complexity, and perceived cost); ‘organization factors’ (top management support, availability of financial support, and perceived employee capability); and ‘environment factors’ (perceived competitive pressure, perceived customer pressure, and perceived vendor support). Additionally, the construct ‘SMEs performance’ is explained by the path coefficients of ‘adopting social media marketing,’ with an R^2 value of 0.453. Based on the results of the endogenous constructs, this research model is considered suitable because it has R^2 values greater than 0.1. Second, model fit evaluation. The results demonstrate that each model meets the criteria, such as SRMR = 0.073; d_ULS = 5.524; d_G = 1.258; and NFI = 0.735, as per the recommended requirements (Hair et al., 2017).

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).

$$\begin{aligned}
 \text{GoF} &= \sqrt{R^2 \times \text{AVE}} \\
 &= \sqrt{0.531 \times 0.646} \\
 \text{GoF} &= 0.586
 \end{aligned}$$

The approach aligns with the framework of Phaosathianphan and Leelasantitham (2021), applying recognized GoF thresholds such as no-fit (<0.1), small-fit (0.10–0.25), moderate-fit (0.25–0.36), and high-fit

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.

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.

(>0.36), following the guidelines proposed by Tenenhaus et al. (2005) and Wetzels et al. (2009). The computed GoF value of 0.586 indicates that the research model exhibits a robust GoF, affirming its predictive solid validity.

Figure 2 and Table 7 present the results of the hypothesis testing analysis. These results indicate that the 'factor technology,' including perceived relative advantage (H1.a), perceived complexity (H1.b), and perceived cost (H1.c), does not significantly influence adopting social media marketing. H1.a, H1.b, and H1.c are not supported, with coefficient values $\beta=0.069$, 0.006, and -0.051 , and t-values of 1.404, 0.122, and 1.014. The 'organization factor,' comprising top management support (H2.a) and perceived employee capability (H2.c), significantly and positively influence adopting social media marketing, thus supporting H2.a and H2.c, with $\beta=0.184$ and 0.311 and t-values of 2.899 and 5.042. However, 'availability of financial support' (H2.b) does not significantly affect adopting social media marketing, and H2.b is not supported, with a coefficient value $\beta=0.047$ and a t-value of 0.705. The influence of 'perceived customer pressure' and 'perceived vendor support' as environmental factors on adopting social media marketing significantly and positively influences the model, supporting H3.b and H3.c, with $\beta=0.154$ and 0.147, and t-values of 2.476 and 2.620. Meanwhile, 'perceived competitive pressure' does not significantly affect adopting social media marketing, leading to the rejection of H3.a, with $\beta=0.038$ and a t-value of 0.734. Lastly, adopting social media marketing significantly and positively impacts 'SMEs performance,' thus confirming H4, with $\beta=0.673$ and a t-value of 17.730.

Discussion

This study aimed to investigate the factors influencing the adoption of social media marketing in SMEs within the TOE framework to enhance their performance. Firstly, it explored the influence of technology factors, organization factors, and environment factors on the adoption of social media marketing. The results indicated that technology factors, specifically perceived relative advantage (H1.a), perceived complexity (H1.b), and perceived cost (H1.c), did not significantly affect the adoption of social media marketing. This suggests that a lack of in-depth understanding of the potential of social media and resource constraints may obscure the perceived relative advantage (H1.a). Consequently, this poses a constraint for SMEs in finding the best ways to use social media as part of their marketing strategy. These findings

Table 6. Cross-Loading Matrix and Multicollinearity 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
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.

align with Amoah et al. (2023), who noted that the relationship of perceived relative advantage does not support the adoption of social media in SMEs. Perceived complexity (H1.b) does not appear to be a major barrier in the decision to adopt social media marketing because the desire to enhance visibility and customer engagement outweighs the perceived complexity, as supported by Ali Abbasi et al. (2022). The availability and flexibility of social media offer a range of options tailored to SMEs' budgets, thus perceived cost (H1.c) is not supported, confirming prior research (Ali Abbasi et al., 2022).

Among the three organization factors, the results indicate that adopting social media marketing is positively and significantly influenced by top management support (H2.a) and perceived employee capability (H2.c). Meanwhile, the availability of financial support (H2.b) does not exhibit a significant relationship. This research finding suggests that SMEs decide to adopt social media when there is strong top management support (H2.a) coupled with a better understanding and awareness of the benefits of using social media marketing. These results are consistent with Ali Abbasi et al. (2022), which reinforces top management support as a predictor of the adoption of social media technology. Additionally, perceived employee capability (H2.c) has a significant impact due to the level of understanding and skills of employees in using social media. This is confirmed by prior research (Ahmad et al., 2018; Amoah et al., 2023). Meanwhile, the availability of financial support (H2.b) does not demonstrate a significant

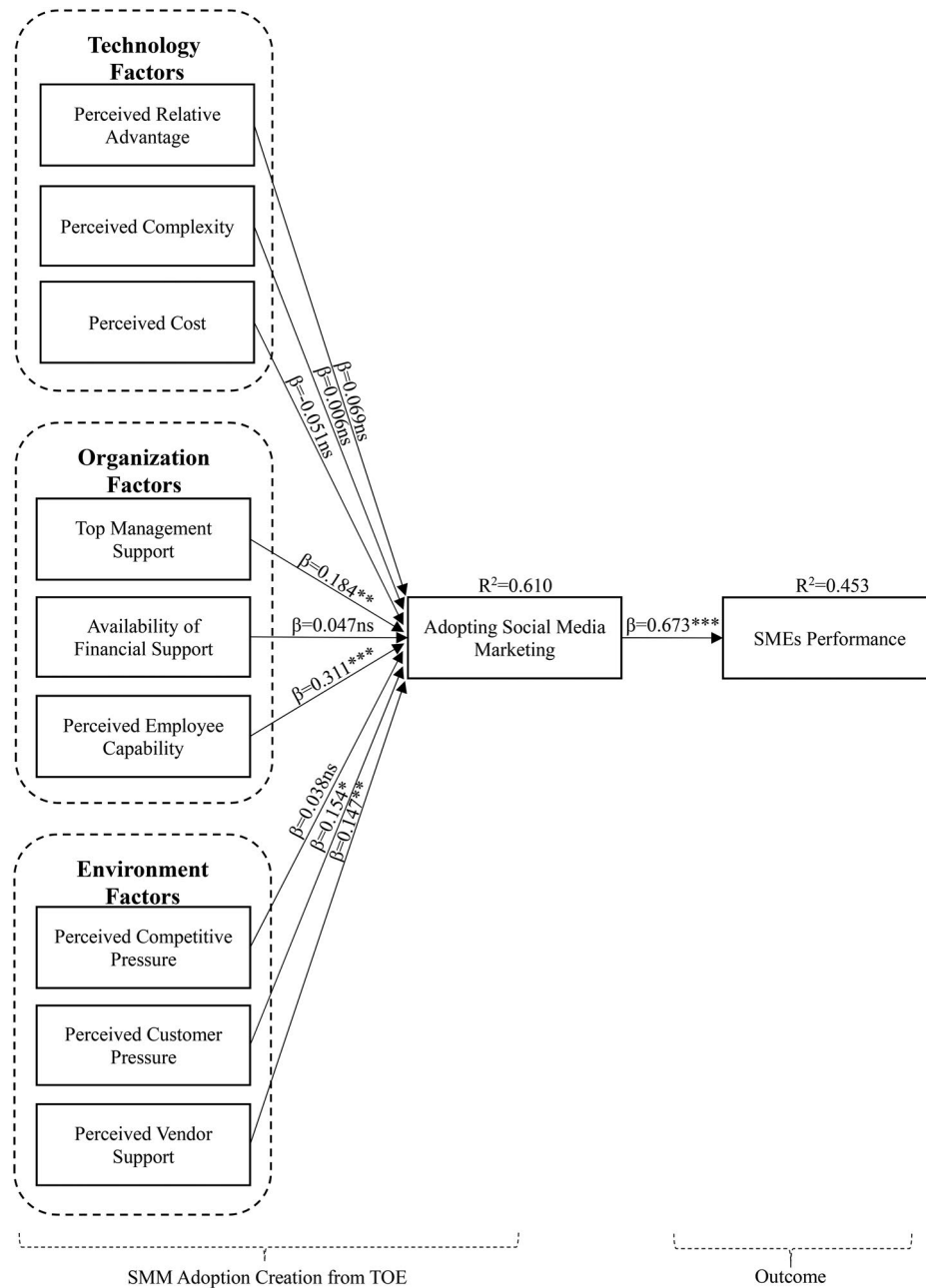


Figure 2. Summary of hypothesis testing visualized in graphics.

Table 7. Summary of Hypothesis Testing.

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

Notes: Significance level.

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

relationship with adopting social media marketing, possibly because social media marketing is cost-effective and has lower costs compared to other marketing tools.

The environment factor suggests that the influence of perceived customer pressure (H3.b) and perceived vendor support (H3.c) on adopting social media marketing by SMEs is positive and significant. In other words, perceived customer pressure (H3.b) indicates that social media helps SMEs enhance customer presence and reduce existing competitive pressures. This finding aligns with Qalati et al. (2022) and Amoah et al. (2023), who have demonstrated that perceived customer pressure plays a crucial role for SMEs in adopting social media. Similarly, perceived vendor support (H3.c) significantly influences the adoption of social media marketing in SMEs. This illustrates that SMEs receive support from vendors with the potential capability to meet technical, operational, and financial requirements, ultimately fostering a positive perspective on adopting social media marketing. This is consistent with prior research (Ali Abbasi et al., 2022). However, perceived competitive pressure (H3.a) does not demonstrate a significant relationship with adopting social media marketing. This finding contradicts Ali Abbasi et al. (2022), which found that perceived competitive pressure has a positive and significant relationship. One potential reason for the lack of significance in the impact of perceived competitive pressure is that SMEs base their marketing decisions on their understanding of their brand identity and customer base, rather than reacting to competitors' actions. Overall, organization factor (perceived employee capability) and environment factor (perceived vendor support) serve as primary predictor factors motivating SMEs to adopt social media marketing.

Lastly, the study's findings reveal that adopting social media marketing (H4) significantly and positively influences SMEs' performance. Efficiency in addressing customer needs has been enhanced through the adoption of social media marketing. This further expands their reach to a larger customer base. As a result, this implementation leads to increased attention and interest from potential customers. Moreover, SMEs adjust their marketing strategies in a more innovative manner, optimize their expenditures, and identify new opportunities. This has an impact on increased sales, ultimately enhancing the performance of SMEs that are increasingly connected and digitized. These findings are consistent with previous research (Qalati et al., 2021).

Implication

Implication for theory

The model based on the TOE framework illustrates that this research provides empirical support and a solid theoretical foundation regarding the adoption and innovation of social media technology. Since social media is a customer-focused technology, it has become an effective and beneficial marketing tool for SMEs. Because of social media's importance and its benefits, attention has been directed to various fields, especially information systems and management. SMEs can build and implement information systems that help them maximize the benefits of adopting social media. Social media is essential in modern marketing and business management for SMEs. Previous research indicates that most SMEs still need to be more hesitant to use social media marketing technology due to the lack of guidelines or frameworks to guide them in understanding and implementing the technology. Moreover, few systematic studies depict the actual state of social media adoption and SMEs' performance, even though business managers are active social media users (Maduku et al., 2016). Therefore, this research develops a conceptual framework by integrating the TOE model, aiming to enhance our understanding of the correlation between adopting social media marketing factors and SMEs' performance as a significant theoretical contribution to the field and an advancement of research in this area.

Based on the framework proposed by Tornatzky et al. (1990), this research investigates the factors influencing SMEs' adoption of social media. By employing the TOE framework, this study provides a relevant method for implementing innovative strategies through social media adoption. In line with the research findings, the theoretical implications are as follows: First, this research utilizes the nine dimensions of the three TOE framework factors: technology factors (perceived relative advantage, perceived complexity, and perceived cost); organization factors (top management support, availability of financial support, and perceived employee capability); and environment factors (perceived competitive pressure,

perceived customer pressure, and perceived vendor support) concerning the adoption of social media marketing (SMM) and SMEs' performance. When assessing these antecedents, the findings reveal that organization and environmental factors are more significant than technology factors. Organizational factors, through dimensions like top management support, understanding, and readiness for the benefits of using social media, and perceived employee capability in terms of the ability and expertise in applying the technology, are supported by environmental factors. These include perceived customer pressure for enhancing customer presence and perceived vendor support through potential vendor support, indicating a positive contribution to SMEs' adoption of social media marketing. In contrast, previous research that applied TOE factors typically used more general factors to test innovation adoption and found that adopting social media was challenging to predict in the context of SMEs (Qalati et al., 2021). Therefore, this research uncovers the relationships between more specific TOE factors and the adoption of social media marketing, which further expands the TOE framework collaboratively and interactively. Hence, this study enhances theoretical insights into empirical TOE factors through organization and environment factors in the vertical marketing and information management fields to achieve SMEs' competitive advantage.

Secondly, social media is crucial for SMEs to enhance their performance. This study also aims to demonstrate how effective the adoption of social media marketing is in improving SMEs' performance. Previous research has been limited in assessing and interpreting the picture regarding the implementation of social media marketing and its impact on SMEs' performance (Ali Abbasi et al., 2022). Consequently, these findings illustrate that SMEs deciding to adopt social media marketing show a significant improvement in their overall performance. Through adoption, SMEs can identify specific customer needs and have a broad reach to potential customers. Therefore, adopting social media marketing becomes an appropriate innovative strategy for enhancing SMEs' capabilities.

Implication for SMEs

The findings of this research offer a comprehensive view for SME owners, executives, and managers to understand the true importance of adopting social media marketing. To achieve a competitive advantage, much research focuses on the benefits gained from the implementation of social media marketing in SMEs (Ali Abbasi et al., 2022; Qalati et al., 2021). The implementation of social media marketing is seen as a key strategy that allows SMEs to maintain their competitive position, which positively impacts their performance. Despite its significant impact and importance for SMEs, existing literature is insufficient in exploring the factors that influence the adoption of social media marketing, selecting or practicing social media platforms, and how these impact the overall business management performance (Qalati et al., 2021). In light of these insights, this research facilitates a deeper understanding of the factors that influence the adoption of social media marketing and what kind of adoption is effectively enhancing SMEs' overall performance. First, this study suggests that SMEs might undervalue the benefits of social media due to limited understanding and resource concerns. While the perceived relative advantage does not significantly drive social media adoption, the urge to increase visibility and customer interaction is powerful enough to override apprehensions regarding the complexity of these platforms. The study advocates for SMEs to consider a strategic embrace of social media, leveraging its cost-effectiveness and expansive reach to foster customer engagement and enhance brand presence. Such findings underscore the need for SMEs to cultivate a more sophisticated understanding of social media marketing's potential, aligning with insights from Amoah et al. (2023) and Ali Abbasi et al. (2022), thereby guiding SMEs to judiciously allocate resources towards digital marketing channels that promise substantial returns on investment.

SME owners/managers strive to enhance their marketing practices through the adoption of social media by providing various tools to improve their performance, as evidenced by this research. Further, the present study elucidates that the adoption of social media marketing within SMEs is significantly influenced by top management support and perceived employee capability, contrary to financial support which does not exhibit a significant correlation. This accentuates the necessity for SME leadership to not only endorse social media initiatives but to also link these with the overarching business strategies,

fostering an environment where social media is perceived as an integral tool for achieving business objectives. Concurrently, enhancing the employees' adeptness in utilizing social media through targeted training can amplify the efficacy of these marketing efforts. This suggests that SMEs can leverage the cost-effective nature of social media marketing to forge a competitive stance in the market without necessitating substantial financial investment, thus reallocating resources to cultivate a robust understanding and strategic use of these platforms. The strategic implication posits that a blend of management support and skilled human capital trumps financial expenditure in cultivating a fruitful social media presence, enabling SMEs to effectively navigate the digital marketing environment.

For SMEs, the adoption of social media marketing should be strategically customer-focused, leveraging the significant influence of perceived customer pressure by engaging deeply with customer feedback and preferences to enhance their online presence. Concurrently, SMEs must capitalize on the substantial impact of vendor support, forging partnerships to meet the technical, operational, and financial facets of social media marketing initiatives. This dual approach, validated by the research of Qalati et al. (2022) and Amoah et al. (2023), suggests a departure from competitor-driven strategies, given the lack of significant correlation with competitive pressure, and instead encourages SMEs to develop and maintain a unique brand identity and customer loyalty. Ultimately, this paradigm shifts the emphasis from competition-based to customer-centric and resource-backed strategies, indicating a more sustainable pathway for SMEs to thrive in the dynamic landscape of social media marketing.

Strategic adoption of social media marketing is a pivotal enhancer of SME performance, offering a versatile avenue for improved customer engagement and market expansion. SMEs should, therefore, prioritize integrating social media within their marketing strategies to capitalize on its potential to not only magnify customer outreach but also stimulate interest among potential customers. This necessitates a pivot towards innovative and cost-optimized marketing tactics that leverage the interactive and analytical capabilities of social media platforms, facilitating a paradigm shift from traditional methods to more dynamic, real-time customer engagement. The consequent innovation and exploration of new market opportunities lead to increased sales and overall business performance. Endorsed by the scholarly insights of Qalati et al. (2021), these findings advocate for SMEs to embed social media marketing deeply into their operational strategies to ensure enhanced competitiveness and growth in the digital marketplace.

Conclusion, limitation and future studies

This research's adept application of the TOE framework provides a significant stride in vertical marketing and information management within the SME context. By employing SEM methodology, the study identifies that organization-related factors—particularly top management support and perceived employee capability—and environmental factors, such as perceived customer pressure and perceived vendor support, are pivotal in motivating SMEs to engage in social media marketing. These findings advocate for an integrative approach to marketing strategies, reinforcing that adopting social media is a strategic move that can result in substantial performance improvements for SMEs (Ali Abbasi et al., 2022; Qalati et al., 2021).

Building on these insights, it is imperative for SME managers to establish comprehensive social media marketing strategies, coupling top management support and optimizing employee capabilities to improve their market positioning. The results also suggest that attention to customer engagement and strategic vendor collaboration can significantly amplify the impact of social media marketing efforts. As such, integrating tailored marketing tactics that respond to customer interactions and leveraging analytics for market insights should be a cornerstone of SME marketing strategies (Amoah et al., 2023; Qalati et al., 2021).

While this study contributes valuable knowledge, it also reveals limitations, particularly the subdued relationship with technology-related factors—a dimension that warrants further investigation for a complete understanding of its influence on social media marketing adoption (Amoah et al., 2023; Qalati et al., 2021). Additionally, focusing exclusively on the pre-adoption phase restricts the scope of understanding the full impact on SME performance. Future research should, therefore, extend to both

pre-adoption and post-adoption phases to provide a comprehensive view (Suryani et al., 2021). This dual-phase analysis will enable SMEs to develop a nuanced marketing plan that not only integrates social media strategies but also enhances their competitiveness and sustainability in both domestic and international business arenas.

Author contributions

Conceptualisation: C.J.F.; A.D.K.S.; Methodology: A.D.K.S.; L.W.Y.; Software: A.D.K.S.; I.J.E.; Validation: A.D.K.S.; I.J.E.; Formal Analysis: A.D.K.S.; Investigation: A.D.K.S.; I.J.E.; Resource: C.J.F.; L.W.Y.; Data Curation: A.D.K.S.; I.J.E.; Writing-Original Draft: C.J.F.; A.D.K.S.; Writing & Review Editing: A.D.K.S.; I.J.E.; Visualisation: C.J.F.; L.W.Y.; Supervision: C.J.F.; L.W.Y.; Project Administrator: A.D.K.S.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, Andri Dayarana K. Silalahi (andridksilalahi@gmail.com), upon reasonable request.

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Appendix A

Table A. Measurement Items.

Construct	Items
<i>Perceived Relative Advantage</i> (Ali Abbasi et al., 2022)	Social media marketing would enable SMEs to market our products/services in a better way Social media marketing would enable our enterprise to communicate with customers effectively SMEs would be able to reach our customers timeously with social medial marketing Social media marketing would assist SMEs to develop better relationships with customers
<i>Perceived Complexity</i> (Ali Abbasi et al., 2022)	The use of social medial marketing would require a lot of mental effort The use of social media marketing would be frustrating Social medial marketing would be too complex for SMEs marketing activities The skills needed to use social medial marketing would be too complex for employees of SMEs
<i>Perceived Cost</i> (Ali Abbasi et al., 2022)	The costs involved in the adoption of social media marketing would be far greater than the expected benefits The cost of maintaining social medial marketing would be very high for SMEs The cost involved in providing support systems for social medial marketing would be too high The amount of money invested in training employees to use social medial marketing would be very high
<i>Top Management Support</i> (Ali Abbasi et al., 2022)	Top management would provide resources necessary for the adoption of social media marketing Top management would provide necessary support for the adoption of social media marketing Top management would support the use of social media marketing Top managers would be enthusiastic about adopting social media marketing
<i>Availability of Financial Support</i> (Ali Abbasi et al., 2022)	SMEs would have the financial resources for adopting social media marketing SMEs budgets would be significant enough to support the adoption of social media marketing It would be easy to obtain financial support for social media marketi*+ng adoption from local banks and/or other financial institutions SMEs would take social media marketing more seriously because of the adequate financial support receive from local banks
<i>Perceived Employee Capability</i> (Ali Abbasi et al., 2022)	Employees would be capable of learning new social media marketing related technology easily Employees would be capable of using social media marketing to solve SMEs marketing problems easily Employees would be capable of using social media marketing to interact with customers Employees would be capable of providing new ideas on social media marketing use for SMEs
<i>Perceived Competitive Pressure</i> (Ali Abbasi et al., 2022)	SMEs thinks that social media marketing has an influence on competition in their industry SMEs is under pressure from competitors to use social media marketing Some of SMEs competitors have already started using social media marketing Many of customers would expect SMEs to adopt social media marketing
<i>Perceived Customer Pressure</i> (Ali Abbasi et al., 2022)	Customers would demand that SMEs establish relationships with them using social media marketing Relationship with major customers would suffer if SMEs did not adopt social media marketing Customers consider would consider SMEs to be forward thinking by adopting marketing Vendors actively market the use of social media marketing
<i>Perceived Vendor Pressure</i> (Ali Abbasi et al., 2022)	There would be adequate technical support for social media marketing provided by vendors Training for social media marketing is would be adequately provided by vendors and other training service providers Social media marketing vendors are encouraging SMEs to adopt social media marketing by providing with free training sessions
<i>Adopting Social Media Marketing</i> (Ali Abbasi et al., 2022)	SMEs intends to adopt social media marketing SMEs intends to start using social media marketing regularly in the future SMEs would highly recommend social media marketing for other SME+s to adopt
<i>SMEs Performance</i> (Qalati et al., 2021)	Improved the customer relationship Improved service quality Increased customer engagement Increased SMEs brand visibility and reputation Increased customer loyalty and retention Enhanced customer service Increased awareness and market Share