P ISSN 2301.9093 | E ISSN 2540.8259

JMDK Jurnal Manajemen dan Kewirausahaan

https://jurnal.unmer.ac.id/index.php/jmdk/index

Vol. 13, No. 2, 2025: 175-188

TOE Framework and Social Media Adoption: Effects on Indonesian SME's Digital Performance

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Abstract

This study looks into how social media adoption is impacted by organizational, technological, and environmental (TOE) factors and how that affects the performance of small and medium-sized businesses (SMEs) in Indonesia. As pivotal elements of the national economy, constituting over 60% of GDP and 97% of employment, SMEs are under increasing pressure to adopt digital transformation. Nonetheless, their utilization of social media is often restricted by inadequate technological capabilities, organizational preparedness, and external environmental obstacles. In order to investigate how these factors affect the integration of social media into corporate operations and ascertain whether such adoption improves firm performance, this study makes use of the TOE framework. A quantitative methodology is utilized, with data gathered via online surveys distributed to SME proprietors throughout Indonesia. Findings show technological readiness boosts social media adoption (SMA), but the technological factor (TF) negatively impacts SME performance (SMEP), suggesting complex tech creates 'technostress.' The organizational factor (OF) doesn't affect SMA, but positively impacts performance via teamwork and communication (supporting RBV). The environmental factor (EF) strongly and positively influences both SMA and SMEP, reflecting high market competition. Crucially, SMA does not mediate the TOE-performance link, as SMEs use it reactively, without a strategy. In summary, while technology and environment drive adoption, sustainable performance hinges on organizational capability and an integrated digital strategy. This study's results provide useful information for policymakers, practitioners, and technology providers to promote inclusive digital growth and make the economy more resilient.

Keywords: Environmental Factor; Social Media Adoption; SME Performance; Technological Factor; Organizational Factor.

Article History:
Received: 28-10-2025
Revised: 12-11-2025
Accepted: 21-11-2025
Publish: 31-12-2025

DOI:
10.26905/jmdk.v13i2.16331

How to cite: Lia, D. A. Z., Fitri, R., Wiraguna, R. T., Wahyudi, H. D. (2025). TOE Framework and Social Media Adoption: Effects on Indonesian SME's Digital Performance. *Jurnal Manajemen dan Kewirausahaan, 13*(2), 175-188. https://doi.org/10.26905/jmdk.v13i2.16331.

INTRODUCTION

Small and medium-sized businesses (SMEs) are a big part of the economies of many countries. They help the economy grow and create jobs in many places, such as Indonesia. Evidence from the real world shows how important they are. The economy of the country depends a lot on small and medium-sized businesses. They make up almost all of the workforce and more than half of the GDP (Al Bakri, 2017). Small and medium-sized businesses (SMEs) are also important for social integration, innovation, and fighting poverty. The modern world, which is characterized by globalization and rapid digitalization, offers both exciting opportunities and challenging problems for these businesses. Using social media wisely has become an important way for small and medium-sized businesses (SMEs) to stay competitive, get noticed in the market, and make sure they stay in business for a long time. Social media is a digital tool that is very useful and doesn't cost much. McCann & Barlow (2015) say that it can change things to make marketing work better, make businesses more competitive, and make operations run more smoothly. Not all small and medium-sized businesses (SMEs) in Indonesia are using social media right now, even though it has a lot of potential. Al Bakri (2017) and Effendi et al. (2020) say that this is because of problems that have come up in their businesses, with their tech tools, and in the world around them.

The Technology–Organization–Environment (TOE) framework is widely accepted as a basic theoretical framework for academic research on the use of social media (Eveland & Tornatzky, 1990). This framework suggests that various elements work together to influence how people adopt technology. These elements include organizational factors like manager commitment and financial resources, external environmental factors such as competition and government support, and technological factors like usefulness, compatibility, and complexity of the technology. When considered, these factors significantly impact how companies decide to adopt new technologies. (Abed, 2020; Effendi et al., 2020). Integrating social media is especially helpful for small and medium-sized businesses (SMEs) because it makes their brands more visible, encourages customers to interact with them more, and makes communication channels work better. (Ahmad et al., 2019; Ainin et al., 2015). But these benefits are often outweighed by big problems like not having enough technical knowledge, not having enough money, and cultural resistance to change. (Al Bakri, 2017; El-Gohary, 2012). Furthermore, empirical research regularly emphasizes the need for more research into how these variables interact to affect the performance of SMEs, especially in developing nations like Indonesia, where infrastructural disparities and digital divides are still common. (Alkateeb & Abdalla, 2021; Pateli et al., 2020).

Despite the general recognition of social media's potential benefits for SMEs, most previous research has focused on developed economies. As a result, these studies only offer a limited comprehension of the unique opportunities and difficulties faced by SMEs functioning in emerging markets. Furthermore, not enough research has been done on the mediating role that social media adoption plays in the relationship between Technology–Organization–Environment (TOE) drivers and SME performance. The utilization of cross-sectoral datasets represents a prevalent limitation in contemporary research, constraining the capacity to infer causality and to elucidate the dynamic interplay between adoption and performance over time. (Qalati, Yuan, et al., 2021; Tripopsakul, 2018).

This study seeks to address existing gaps by analyzing the influence of TOE dimensions on social media adoption and evaluating the subsequent effects on SME performance within the Indonesian context. The study contextualizes the analysis within the distinctive socioeconomic and technological landscape of Indonesian SMEs, offering a more thorough assessment of the determinants affecting social media adoption through the application of the TOE framework as an analytical tool. This research provides novel insights into the interplay of various factors that enhance SME performance, illustrating the role of social media as a mediating conduit. The findings not only yield practical implications for enhancing digital adoption in Indonesia's SME sector but also seek to advance theoretical perspectives on social media adoption in SMEs.

This study is crucial as, particularly post-COVID-19 pandemic, enterprises increasingly depend on digital technology for growth and sustainability. Small and medium-sized businesses (SMEs) are the most important part of the Indonesian economy. They need to go digital to stay ahead of the competition. Social media is an easy and cheap way for small and medium-sized businesses (SMEs) to get around budget limits and reach more people. The study's results are meant to give lawmakers, business experts, and technology suppliers ideas that they can use. They are also meant to add to what we already know. This research helps create plans that teach people in nearby areas how to get the most out of technology, encourage more use of social media, and make small and medium-sized businesses (SMEs) in Indonesia more financially stable. Therefore, this study aims to analyze the influence of TOE (Technology, Organization, Environment) dimensions on social media adoption and evaluate the subsequent impact of that adoption on SME performance within the Indonesian context.

LITERATURE REVIEW

SMEs and Social Media Adoption

Small and medium-sized businesses' (SMEs') use of social media has emerged as a key area of scholarly research. Studies like the one conducted by Bogea et al. (2018) emphasize how internal organizational dynamics and external environmental factors interact to determine the adoption process. A good theoretical framework for

examining these effects is the Technology Organization–Environment (TOE) framework developed by Eveland & Tornatzky (1990). Because it incorporates three crucial dimensions: technological readiness, organizational capacity, and environmental pressures, this model has been widely used in a variety of fields (Abed, 2020; Effendi et al., 2020; Pateli et al., 2020; Tripopsakul, 2018). It is especially pertinent to questions about SMEs (Alkateeb & Abdalla, 2021). The TOE framework serves as the foundation for this study due to its comprehensive analysis. Since there isn't a single, widely agreed-upon definition of social media, the idea is intrinsically complicated and open to different interpretations. In scholarly discourse, Kaplan & Haenlein (2010) offer a crucial definition of social media. This viewpoint has been widely used in later research, especially in studies about its implications for education (Aldahdouh et al., 2020) and its applicability to SMEs (Ahmad et al., 2019; Qalati, Li, et al., 2021). Better sales, more interaction with customers, more brand visibility, a bigger marketing audience, better chances to do market research, and lower communication costs are some of the most common benefits. (McCann & Barlow, 2015). The literature also talks about other benefits, such as better integration of systems, more competition, lower costs, and the encouragement of working together. There are a lot of great things that can happen on social media, but many small and medium-sized businesses (SMEs) still have trouble getting started. Al Bakri (2017), El-Gohary (2012), and Meske & Stieglitz (2013) have identified several prevalent challenges, including insufficient technical skills or digital literacy, elevated implementation costs, trust deficits, constrained organizational resources, cultural resistance to new technologies, and inadequate support from institutions or infrastructure. Thus, even though the benefits of using social media are well known, it is still not used enough in many small and medium-sized businesses. (Al Bakri, 2017; McCann & Barlow, 2015).

Technological Factors

Many studies have investigated the link between technological advances and how well organizations do their jobs. The use of technology has been proven in a number of studies to improve the efficiency of organisations. Maduku et al. (2016) say that technology has a big effect on how well a corporation does. In addition, Dutot & Bergeron (2016) highlight the fact that the implementation of new technologies results in a significant improvement in performance, particularly in small and medium-sized businesses. However, Qalati, Li, et al. (2021) say that challenges with using technology can stop small and medium-sized firms from growing in a way that lasts. Kevin et al. (2006) assert that the technical context includes the technology that a business currently utilizes or can readily acquire. The trialability, observability, complexity, compatibility, and relative advantage of an innovation all affect how likely it is to be adopted. The idea of relative advantage is that people look at the pros and cons of a new technology and compare them to those of older technologies. This assumption greatly influences individuals' decisions regarding the adoption of new technology. (Gangwar et al., 2015; Ramdani et al., 2013). Compatibility analysis examines the degree to which a new idea aligns with an organization's culture and procedures, facilitating its integration. (Gangwar et al., 2015). Complexity, on the other hand, shows how hard it is to use something. People are less likely to use something that looks complicated. (Liaw, 2008). AlSharji et al. (2018) say that small and medium-sized businesses (SMEs) can reduce uncertainty and increase confidence through trialability and observability, which let them test and watch new technologies before using them fully.

Social media, which is part of the Web 2.0 paradigm, has features that let people interact with each other. These traits can help small and medium-sized businesses (SMEs) connect with customers better, get more exposure in the market, and do better overall. Small and medium-sized businesses (SMEs) need to know how cost-effective new technology is because money is often a big factor in their decisions about whether or not to use it. (Qalati, Yuan, et al., 2021). Furthermore, its widespread adoption is facilitated by its benefits over conventional marketing tools and its compatibility with modern SME operational practices. (Effendi et al., 2020). Some previous studies identified certain strengths; however, the overall findings remain ambiguous. Some studies, Ahani et al. (2017) and Hamad et al. (2018), have demonstrated that compatibility and relative advantage across various contexts produce favorable results. However, AlSharji et al. (2018) identified no statistically significant correlations in specific cases, indicating contradictory results. Furthermore, technological complexity persists as a significant barrier, since intricate systems frequently deter adoption (Trawnih et al., 2021). These findings collectively highlight the imperative for additional study to clarify the interaction between organisational and technological elements in influencing the success of SMEs and SMAs.

According to Ariel & Avidar (2015), Technological progress has a direct impact on the success of SMEs because it improves managerial decision-making, streamlines operational procedures, and allows for more effective communication. By using social media platforms, small and medium-sized businesses (SMEs) can build customer loyalty, talk directly to customers, and improve their credibility and brand awareness (Lee & Kozar, 2012). To fully take advantage of these benefits, SMEs need to carefully think about how much it will cost to adopt the new technology and how well it will work with their current systems. Based on this reasoning, the following hypotheses are developed:

H_1: Technological factors significantly influence the adoption of social media applications within SMEs.
H_2: Technological factors significantly influence overall SME performance.

Organizational Factors

Both the adoption of technological innovations and their subsequent impact on organizational performance are significantly shaped by organizational factors (OF). Previous research highlights that an organization's inherent attributes, including the level of managerial participation, firm size, organizational structure, and financial resources, serve as critical factors in determining how much social media integration small and medium-sized businesses (SMEs) incorporate into their operations (Abed, 2020; Effendi et al., 2020). Senior management's dedication is especially noteworthy since it shows how eager executives are to support, encourage, and facilitate the use of technology in the service of strategic objectives (Abed, 2020). Given that leaders are usually the main forces behind organizational change by defining workable strategies, assigning funds and staff, and providing direction and inspiration, effective managerial support is essential to successful implementation (Pateli et al., 2020). SMEs with strong top-level commitment, primarily leadership, set strategic priorities, direct resource allocation, and foster an innovative environment (Trawnih et al., 2021). Furthermore, organizational leaders' positive attitudes and technological literacy are important facilitators that support adoption and promote efficient use of these platforms (Effendi et al., 2020). Another important organizational component is financial capacity. Sufficient financial resources allow SMEs to make the operational, training, and infrastructure investments required for social media adoption (Trawnih et al., 2021). In developing nations, where SMEs find it difficult to obtain adequate funding for technological innovation, financial limitations frequently serve as significant obstacles (Çallı & Clark, 2015; Potluri & Vajjhala, 2018). Adoption levels are also influenced by the size and structure of the company. Smaller businesses may find it simpler to incorporate new technologies due to their increased flexibility and adaptability (Jenkins, 2009). On the other hand, bureaucratic barriers may hinder the adoption of innovation in larger businesses. However, even in more structured organizations, these obstacles can be lessened with strong managerial involvement (Nazir et al., 2024). Consequently, the second hypothesis is formulated as:

H_3: Organizational Factors have a significant effect on SMA among SMEs.
H_4: Organizational Factors have a significant effect on SME performance.

Environmental Factors

There are things that a small or medium-sized business (SME) can't control that could stop it from competing, staying in business, or growing. These are called environmental factors. Trawnih et al. (2021) address various issues, including competition, environmental uncertainty, and government support. Kahveci (2025) asserts that these factors significantly influence the frequency and efficacy with which SMEs utilize technologies. The government plays a big role because it can either help or hurt the growth of technology. Tax breaks, spending on infrastructure, and well-thought-out rules are all examples of public policy tools that get small and medium-sized businesses (SMEs) to use social media. Al-Okaily et al. (2020) found that small and medium-sized businesses (SMEs) are much more likely to use technology when the government helps them, especially when things are unstable. Conversely, the lack of supportive measures, which may manifest as stringent regulations or insufficient infrastructure, can hinder digital transformation and limit the ability of small and medium-sized enterprises (SMEs) to leverage social media in their business operations (Borgman et al., 2013).

Competition is one big thing that changes how people use social media apps (SMA). Lertwongsatien & Wongpinunwatana (2003) say that this shows how competitive industries are, which makes small and medium-sized businesses (SMEs) come up with new ways to stay ahead of the competition or move up in the rankings. Scupola (2003) A study found that small and medium-sized businesses (SMEs) that work in very competitive markets are more likely to use social media marketing to stay relevant. In developing economies such as Thailand, Pakistan, and the United Arab Emirates, competition drives the adoption of new ideas (Nuseir & Al, 2018; Qalati, Li, et al., 2021; Tripopsakul, 2018). This is because companies are changing to meet the needs of their customers and the changing business environment. These pressures got even worse when the COVID-19 pandemic started, and as a result, digital transformation became necessary for a company to stay in business during a time of widespread economic uncertainty (Klein & Todesco, 2021).

SMA is also affected by the bandwagon effect, when firms copy their rivals (Abrahamson & Rosenkopf, 1993). When the market is unpredictable, small and medium-sized enterprises may feel they must follow industry standards to be competitive. Political upheavals and natural catastrophes may force companies to employ social media as part of their resilience strategy (Al-Okaily et al., 2020). Due to market competition and limited expansion (Zhu et al., 2003), SMEs are under pressure to embrace social media to become more visible and adaptable. These extrinsic variables have different consequences. Competition hurt Indonesian SMEs' performance (Studen & Tiberius, 2020). External factors (EF) impact social media adoption and company performance. Competitors force strategic adjustments, which force organizations to rethink their digital strategies to be competitive (Geurin & Burch, 2017). Too much competition can waste resources and make things less efficient. On the other hand, the bandwagon effect can also lead to the early or wrong use of technology, which can cause problems (Abrahamson & Rosenkopf, 1993).

The body of existing research emphasizes how EF, SMA, and SME performance are interrelated. The way SMEs use digital technologies to achieve strategic goals is influenced by a few factors, including market dynamics, environmental factors, and government incentives (Eveland & Tornatzky, 1990). Adoption of digital innovations, especially social media, allows businesses to gain a competitive edge while changing the structure of their industries, claim Nazir et al. (2024). Karna Suganda et al. (2022) provided evidence in favor of this thesis by showing that social media adoption promotes product innovation, speeds up entry into new markets, and increases revenue. Accordingly, this study's hypothesis is:

H_5: Environmental Factors have a significant effect on SMA among SMEs.

H_6: Environmental Factors have a significant effect on SME performance.

Social Media Adoption and SME Performance

Since the global financial crisis of 2008–2009, small and medium-sized businesses (SMEs) have been seen as important parts of making the economy more stable, long-lasting, and open to all. They have effects that go far beyond business. They are important for creating jobs, promoting social harmony, lowering poverty, and sparking creativity. In many developing countries, small and medium-sized enterprises (SMEs) account for more than 40% of the economy and almost 70% of all jobs. This shows how important they are for the economy to grow both in the area and around the world.

But SMEs need to change with globalization to keep growing and stay competitive in global markets. This means using digital technologies and putting them all together. SMA also helps new management practices, business models, and communication frameworks grow, which all make small and medium-sized businesses stronger and better at solving problems. More and more people agree that how well a company runs its business affects how well it does. Small and medium-sized businesses (SMEs) can use social networking sites to get the word out about their brands, compete with bigger businesses, and offer better customer service without spending a lot of money. These sites help people trust each other, get people to share what they know, and, in the end, help businesses do better. They also make it easier for people to talk about products and services with each other. In the past, social media has helped businesses do better by making marketing more effective, getting customers more involved, and encouraging collaborative innovation (Odoom et al., 2017; Parveen et al., 2015; Sahaym et al., 2021; Tajudeen et al., 2018).

There is a lot of evidence from real life that SMA is linked to better performance in small and medium-sized businesses (Ahmad et al., 2019; Paniagua & Sapena, 2014; Parveen et al., 2015; Rodriguez et al., 2012; Tajudeen et al., 2018). Some of the benefits that have been reported are higher sales, lower costs, happier customers, better brand recognition, stronger business-to-business relationships, and more visitors to the website. But these benefits can only happen if SMA projects are in line with clear long-term strategic planning and organizational goals. Without this kind of alignment, small and medium-sized businesses (SMEs) risk not getting the most out of social media, which makes the difference in performance between effective and ineffective adopters even bigger (McCann & Barlow, 2015).

From the perspective of the Resource-Based View (RBV), social media is conceptualized as a valuable organizational asset capable of generating sustained competitive advantage. By enabling stakeholder participation, reinforcing customer bonds, and broadening access to market insights, social media functions as an integrated resource system. Becker et al. (2012) argue that SMEs can exploit these interconnected tools to surpass competitors.

Despite its well-documented advantages, prior scholarship demonstrates considerable variation in the operationalization of "performance," thereby producing inconsistent empirical findings. Moreover, most studies have focused on developed economies, leaving a limited understanding of the dynamics within emerging markets. The predominance of cross-sectional research designs further restricts causal interpretation. Therefore, the final hypothesis of this study is stated as:

H_7: SMA has a significant effect on SME performance.

H_8: SMA mediates the relationship between Technological Factors and SMEs' performance.

H_9: SMA mediates the relationship between Organizational Factors and SMEs' performance.

H_{10}: SMA mediates the relationship between Environmental Factors and SMEs' performance.

The conceptual framework presented in Figure 1 encapsulates the interconnections established in prior literature and formulated within the hypotheses, combining the TOE framework with Strategic Management Accounting (SMA) and the performance of SMEs. This model examines not only the direct influence of TOE dimensions on both SMA and SME performance but also highlights the intermediary function of SMA in bridging TOE factors with organizational outcomes. By offering such an integrative structure, the model provides a robust foundation for investigating the dynamics of digital adoption among SMEs in emerging economies, thereby yielding valuable insights for policymakers, business practitioners, and technology developers.

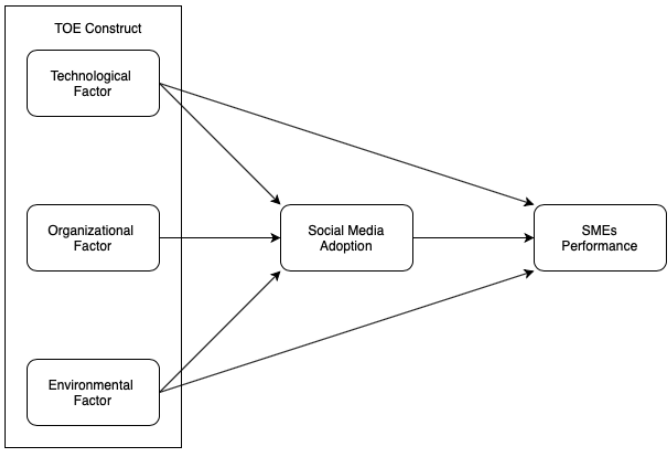

Figure 1. A Conceptual Framework

METHOD

The impact of the Technology–Organization–Environment (TOE) paradigm on Social Media Adoption (SMA) and, in turn, on the performance of small and medium-sized businesses (SMEs) in Indonesia is examined in this study using a quantitative methodological approach. It looks at how organizational, technological, and environmental factors interact to affect how much small and medium-sized businesses (SMEs) use social media. To gather accurate data from small and medium-sized business (SME) owners in different parts of Indonesia at the same time, the study used a cross-sectional methodology. According to the suggested conceptual model, social media adoption serves as a mediating construct that links small and medium-sized businesses' (SMEs') performance outcomes to the TOE dimensions. A structured survey instrument based on measurement scales that have undergone rigorous validation in previous academic research to ensure their accuracy will be used to collect data for the study. The reliability and validity of the results are ensured by carefully contextualizing the instrument to the Indonesian SME environment, which improves its clarity and applicability.

Data will be gathered through an online survey directed at owners and managers of small and medium-sized enterprises (SMEs) across various industries in Indonesia. A random sampling technique will be utilized, aiming for a final sample size of 330 participants. The survey will be administered via a digital platform to maximize accessibility while minimizing costs. Before the main distribution, a pilot study will be undertaken to assess the validity of the questionnaire, ensuring that the items are reliable, clearly understood, and suitably aligned with the contextual background of the intended respondents.

This study uses modified measuring items from scales that have been tested in real life. Each idea is given a score 1-5 scale, 1 for "strongly disagree" and 5 for "strongly agree." This is in line with what other studies have found. The tool keeps track of how well SMEs do in terms of their business, technology, the environment, and social media. To analyze the primary data, this study will employ PLS-SEM. The analysis will follow a two-step process: first, the measurement model will be assessed for reliability and validity. Second, to conduct the hypothesis test, the structural model will be evaluated using a bootstrapping procedure to determine the statistical significance (p-values) and direction of the path coefficients, thereby testing the relationships between the TOE factors, social media adoption, and SME performance.

RESULT

The gender distribution of respondents is reasonably balanced, as evidenced by Table 1, with 54.5% being male and 45.5% being female. This ensures a variety of perspectives. Most participants are aged 45–54 (31.8%), followed by those 25–34 (25.5%) and 35–44 (20.6%), suggesting that many SME leaders are experienced and likely to make informed business decisions, including in digital marketing. In terms of education, 60% hold a Diploma 4 or Bachelor's degree, 21.8% have completed high school, and 16.7% hold a lower diploma. Only 1.5% have a Master's degree. This suggests a relatively well-educated group, likely open to adopting new technologies. Occupationally, 43.6% are SME owners, 40.6% are managers or supervisors, and 15.8% are employees. This highlights that most respondents are in leadership roles, making them key decision-makers.

Sector-wise, the highest representation is from food and beverage (27.3%), followed by health and beauty (25.5%) and services (19.1%). Retail (12.4%) and tech/digital (15.8%) are less represented. These patterns reflect market demand and industry trends in Indonesia. Regarding business age, nearly half (49.7%) have operated for 7–10 years, 32.7% for 4–6 years, and 18.2% for over a decade. Only 1.2% are newer businesses (1–3 years), indicating a mature and stable sample. Overall, the respondents are experienced, educated, and in decision-making roles, mainly from well-established SMEs in key consumer sectors. This profile supports the study's focus on technology adoption and strategic business behavior.

Table 1. Distribution of Respondent Data

Characteristic	Category	Frequency	Presentation
Gender	Male	180	54.5%
	Female	150	45.5%.
Age	18 - 24	59	17.9%
	25 – 34	84	25.5%
	35 – 44	68	20.6%
	45 – 54	105	31.8%
	> 55	14	4.2%
Education	Senior & Vocational High School	72	21.8%
	Diploma 1/2/3	55	16,7%
	Applied Bachelor/Bachelor's Degree	198	60%
	Master's Degree	5	1.5%
Occupation Status	SMEs Employee	52	15.8%
	Manager / Supervisor	134	40.6%
	Owner of SMEs	144	43.6%
Type of SMEs	Service	63	19.1%
	Health & Beauty	84	25.5%
	Food & Beverage	90	27.3%
	Retail	41	12.4%
	Technology & Digital	52	15.8%
Duration of Business	1 – 3 Years	3	1.2%
	4 – 6 Years	108	32.7%
	7 – 10 Years	158	47.9%
	More than 10 Years	60	18.2%

The standardised loading factor values for each indicator (Table 2) let you see how reliable each one is. It is considered that an indication is legitimate when its loading factor reaches a level of 0.7. Based on the analysis, all of the indicators used in this research meet this condition. Table 2 shows the full findings. The table shows that every variable item has an outside loading of more than 0.7. Consequently, all measuring items included in this study are validated and deemed suitable for further analysis.

Table 2. Outer Loading Factor

Variabel	Indicator	Item	Outer Loading Factor
Technological Factors (Ahmad et al., 2019; Nazir et al., 2024; Qalati, Yuan, et al., 2021)	Relative Advantage	The advent of social media has created novel avenues through which businesses can foster organizational expansion and cultivate more dynamic interactions with their stakeholders.	0.906
		Social media helps SMEs complete specific tasks more efficiently.	0.904
		Social media contributes to improved productivity within the organization.	0.872
		Social media enables SMEs to gather insights about their competitors.	0.836
		Social media enhances the effectiveness of advertising and marketing efforts.	0.961
		Social media contributes positively to the company's public image.	0.936
	Cost Effectiveness	The utilization of social media platforms was strategically implemented as a means to minimize expenditures associated with marketing communication activities.	0.965
		Digital social networking platforms significantly reduce the temporal and operational demands associated with branding initiatives, marketing strategies, and customer service management.	0.984
		Social media represents a comparatively more economical promotional avenue for SMEs than conventional platforms.	0.974
	Compatibility	Our company's existing technological infrastructure supports.	0.860

Variabel	Indicator	Item	Outer Loading Factor
		The adoption of social media aligns with our organizational values and beliefs.	0.732
		The adoption of social media fits well with our current business processes and operations.	0.863
	Interactivity	Social media serves as a medium that facilitates two-way, dynamic interaction between organizations and their customers.	0.914
		Through sustained engagement, social media also functions as a platform that fosters collaborative processes, enabling customers to actively contribute to the creation and enhancement of value.	0.924
		Social media allows controlled customer interactions through mentions and replies.	0.652
	Visibility	We promote our latest services or products	0.801
		Social media helps increase the visibility of our business.	0.768
		Social media supports brand awareness and brand presence in the market.	0.689
Organizational Factors (Ahmad et al., 2019; Nazir et al., 2024; Qalati, Yuan, et al., 2021)	Top management support	SME owners show strong interest in adopting social media.	0.958
		SME owners view social media adoption as strategically important.	0.957
		SME owners have demonstrated support for integrating social media into business practices.	0.949
		SME owners emphasize research and development, technological leadership, and innovation.	0.970
Environmental Factors (Ahmad et al., 2019; Nazir et al., 2024; Qalati, Yuan, et al., 2021)	Competitive industry	Customers can easily switch to competitors offering similar products or services.	0.812
		Customers have access to alternative offerings that serve the same function, even from different markets.	0.902
		There is considerable competition within our industry.	0.794
	Competitive pressure	The strategic utilization of social media contributes significantly to the establishment of a more resilient and sustainable competitive edge.	0.954
		Moreover, social media strengthens organizational capacity to surpass industry rivals by enhancing performance differentials.	0.950
		Social media supports increased profitability for the business.	0.944
	Bandwagon effect	Social media is widely used, which encourages us to adopt it.	0.783
		SME owners follow peer companies in adopting social media tools.	0.880
		SME owners chose to adopt social media largely because many other businesses are already using it.	0.782
Social Media Adoption (Ahmad et al., 2019; Nazir et al., 2024; Qalati, Yuan, et al., 2021)	Social media for marketing	Social media adoption supports marketing research activities.	0.961
		Social media adoption facilitates word-of-mouth marketing through likes, shares, and followers.	0.963
		Social media adoption enables SME owners to promote products and services effectively.	0.959
		Social media adoption helps SME owners deliver better customer service.	0.855
	Customer relationship	Social media adoption supports the development of long-term customer relationships.	0.937
		Social media adoption facilitates direct communication with customers.	0.941
		Social media adoption allows SME owners to manage customer service interactions.	0.899

Variabel	Indicator	Item	Outer Loading Factor
	Information accessibility	Social media adoption enables SME owners to collect feedback on existing products and services.	0.941
		Social media adoption supports obtaining input on new or upcoming offerings.	0.917
		Social media adoption helps SME owners reach new customer segments.	0.938
		Social media adoption allows SME owners to access general market information.	0.906
		Social media adoption helps gather competitive intelligence.	0.944
		Social media adoption facilitates the collection of customer-related data.	0.957
SMEs' performance (Ahmad et al., 2019; Qalati, Yuan, et al., 2021)	Strengthened customer relationships		0.938
	Improved service quality		0.941
	Greater customer engagement		0.892
	Enhanced visibility and brand reputation		0.719
	Increased customer loyalty and retention		0.902
	Better customer support services		0.932
	Higher brand awareness and market share		0.899

All of the measurement indicators show outside loading values that are always higher than the 0.70 threshold that was set. Table 3, that for each latent construct is higher than the minimum requirement of 0.50 (AVE). This demonstrates that the constructs possess convergent validity. Also, the scores for Cronbach's Alpha and Composite Reliability (CR) for each construct are higher than the recommended level of 0.70. When looked at as a whole, these statistical results strongly support the idea that the constructs used in this study are both valid and reliable.

Table 3. Construct Reliability and Validity

Variable	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)	Result
Technological Factor	0.817	0.818	0.896	0.743	Valid & Reliable
Organizational Factor	0.971	0.983	0.978	0.919	Valid & Reliable
Environmental Factor	0.826	0.831	0.899	0.756	Valid & Reliable
Social Media Adoption	0.950	0.952	0.956	0.871	Valid & Reliable
SMEs Performance	0.956	0.959	0.964	0.796	Valid & Reliable

The evaluation of the inner model in this research involves two principal components: the examination of the R-Square values and the testing of hypotheses (refer to Table 4 and Figure 2). Within the context of PLS-SEM, an R-Square coefficient exceeding 0.67 is typically regarded as indicative of strong explanatory power, values ranging between 0.33 and 0.67 suggest a moderate level of explanatory adequacy, while coefficients below 0.33 denote weak predictive strength. Based on the data reported (Table 4), the R-Square value for SMA is computed to be 0.645, meaning that exogenous factors contained within the TOE framework can explain 64.5% of the variation seen in SMA, while the remaining 35.5% is due to effects outside the model. Accordingly, SMA is classified within the category of moderate predictive capacity. Comparably, the R-Square value for SMEP is determined at 0.577, indicating that 57.7% of the variance in SMEP is accounted for by SMA in conjunction with other predictive variables, while the residual 42.3% is attributable to factors not incorporated into the present model. This value likewise places SMEP within the moderate explanatory classification.

Table 4. R-Square Model

Variable	R-Square
SMA	0.645
SMEP	0.577

The outcomes of the hypothesis testing, as illustrated in Figure 2, reveal a mixture of statistically significant and non-significant associations among the investigated constructs. The pathway from technological factors (TF) to social media adoption (SMA) exhibits a robust, positive, and highly significant effect ($\beta = 0.725$; $p < 0.001$), implying that a higher level of technological readiness substantially facilitates the uptake of social media.

Conversely, the direct pathway linking TF to SMEs' performance (SMEP) is negative yet statistically significant (β = -0.138; p = 0.023), suggesting that technological readiness, in isolation, does not necessarily translate into enhanced performance unless effectively utilized. The association between organizational factors (OF) and SMA is positive but does not achieve conventional levels of statistical significance (β = 0.078; p = 0.052), thereby providing only modest empirical support. On the other hand, environmental factors (EF) exhibit a frequently favourable and statistically significant impact on the two variables SMA (β = 0.099; p = 0.005) and the SMEP (β = 0.860; p < 0.001), thereby emphasising the crucial role that external environmental conditions play in influencing both implementation behaviour and performance outcomes.

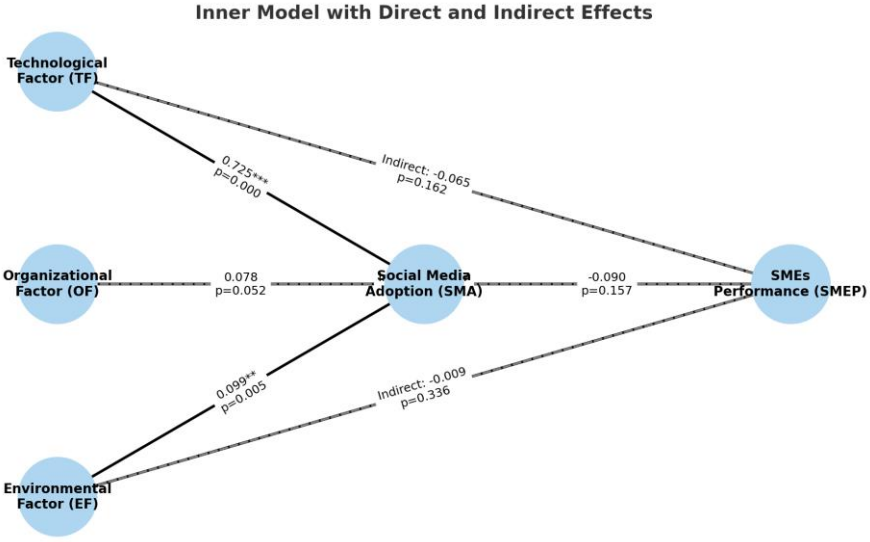

Figure 2. Inner Model with Direct and Indirect Effects

Due to the fact that the correlation between Social Media Adoption and Social Media Engagement Performance (SMEP) is negative and statistically insignificant (β = -0.090; p = 0.157), it can be concluded that the mere adoption of social media does not ensure increases in performance. As a further point of interest, the analysis of mediation indicates that the indirect effects of TF (β = -0.065; p = 0.162), OF (β = -0.007; p = 0.389), and EF (β = -0.009; p = 0.336) on SMEP via SMA are not statistically significant. Based on the findings presented, it seems that SMA does not function as a significant mediating mechanism that links the TOE dimensions to the performance of SMEs within the context of this study.

DISCUSSION

The findings bring to light a multifaceted understanding of the extent to which the performance of small and medium-sized enterprises (SMEs) is influenced by the technological (TF), organisational (OF), and environmental (EF) dimensions. This is accomplished through direct mechanisms as well as indirectly through the mediation of social media adoption (SMA). The descriptive evidence further demonstrates that a significant proportion of participants were proprietors or managerial representatives of culinary SMEs concentrated within two tourism-oriented urban centres, namely Batu and Yogyakarta. Most had been operating for more than five years, but with limited formal digital marketing training, and their businesses were predominantly micro-scale. This context is critical for interpreting the results, as it reflects enterprises that are often highly adaptive to customer trends but constrained by resources and structured digital strategies.

The Effect of Technological Factors on The Adoption of Social Media within SMEs.

The findings of Hypothesis 1 demonstrate that Technological Factors have a substantial and favourable influence on Social Media Adoption (SMA). This finding indicates that SMEs with even a basic level of technological readiness - such as reliable internet access, smartphones, or point-of-sale (POS) systems - exhibit a greater likelihood of incorporating social media platforms into their marketing strategies. Comparable trends have likewise been documented in prior research, including the study by Ahmad et al. (2019), where minimal technological infrastructure acted as a trigger for adoption, especially in markets where face-to-face interactions are common but increasingly supplemented by digital engagement. The positive coefficient here reflects that for these respondents, technology access is no longer a barrier; rather, it becomes an enabler for initial digital adoption.

The Counter-Intuitive 'Technostress' Effect of Technology on Performance

Notably, the second hypothesis (H2: TF → SMEP) receives empirical support; however, the relationship is characterized by a negative path coefficient (β = –0.138, p = 0.023). Such an outcome, which appears counterintuitive, implies that within the context of these SMEs, greater technological readiness does not necessarily foster improved performance. On the contrary, it may introduce operational inefficiencies that hinder effectiveness. This observation resonates with prior discussions in the "technostress" stream of research (Ragu-Nathan et al., 2008; Tarafdar et al., 2011), where technology, without adequate digital skills or strategic integration, increases operational complexity and distracts from core business functions. For example, in micro business settings like those common among respondents, investment in sophisticated tools without the human resource capacity to use them effectively can lead to underutilization, wasted costs, and even customer service lapses.

The Divergent Roles of Organizational Factors

There is no evidence to support Hypothesis 3 (OF → SMA), which suggests that internal organizational features, such as size, structure, or resource availability, did not play a major role in driving the adoption of social media applications. Given that the majority of respondents operate with fewer than 10 employees and largely family-based management, formal organizational alignment may not be a prerequisite for technology adoption. Instead, decisions about adopting SMA are often made informally, driven by owner intuition or peer influence rather than formal policies or resource planning.

Conversely, H4 (OF → SMEP) is positive and significant, which indicates that even without formal structures, organizational elements like entrepreneurial orientation, teamwork, and internal communication can still influence performance directly. Despite the lack of advanced digital adoption, this is in line with the Resource-Based View (RBV) (Barney, 1991) that states that human capital, small-scale firms' internal and tacit knowledge, are significant performance drivers.

Environmental Factors as a Catalyst

From an environmental perspective, H5 (EF → SMA) and H6 (EF → SMEP) are both positive and significant. This is consistent with studies highlighting that market dynamism, competitive pressures, and customer expectations, particularly in tourism-oriented cities, encourage both technology adoption and performance improvements (Nambisan et al., 2019). In tourism cities like Batu and Yogyakarta, Indonesia, where SMEs serve a large influx of both local and international tourists, competitive visibility is crucial, and environmental pressures become a catalyst for digital experimentation.

The 'Adoption-Performance Gap' and the Failure of SMA as a Mediator

A critical finding of this study is the comprehensive lack of empirical support for H7, H8, H9, and H10. This indicates that Social Media Adoption (SMA) not only fails to significantly impact SME performance directly (H7) but also fails to function as a mediator between the TOE characteristics and performance (H8-H10).

There is, however, a lack of empirical support for the hypotheses H7 through H10, which propose that Social Media Adoption (SMA) serves as a mediator between TOE characteristics and SMEP. In this particular sample, the sheer use of social media is not enough to transfer contextual preparation into observable gains in organisational performance, as shown by the existence of route coefficients that are either minor or even negative. This outcome resonates with the conclusions of Al Bakri (2017) and Ahmad et al. (2018), who noted that SMEs frequently engage in social media usage in a reactive manner, often devoid of a coherent content framework, systematic performance monitoring, or alignment with overarching strategic objectives. Among respondents in the present investigation, SMA practices were predominantly confined to rudimentary promotional postings, lacking the sophistication of targeted advertising, data-driven analytics, or integration with customer relationship management platforms. Such limitations provide a plausible explanation for the weak mediating influence observed.

CONCLUSION

Theoretically, these results enrich the TOE framework by underscoring that contextual readiness and environmental pressure can drive adoption and performance directly, but the mediating role of SMA is not automatic; it requires strategic, skill-intensive deployment. From the RBV perspective, SMA can be a valuable resource, but without complementary capabilities such as digital literacy, creative content development, and data-driven decision-making, its performance impact remains muted.

From a managerial implication standpoint, this study suggests that SMEs, particularly in tourism-heavy culinary sectors, must move beyond viewing SMA as a one-off promotional tool. Instead, they should embed it into broader marketing strategies, allocate dedicated resources, and integrate it with other operational processes. Policymakers and industry associations could support this shift by offering targeted digital skills training,

subsidized access to analytics tools, and peer learning networks to ensure that technological adoption translates into sustainable performance gains.

For future researchers, this study highlights several promising avenues. First, a longitudinal study is recommended to track the co-evolution of social media adoption and SME performance over time, which could establish causality more clearly. Second, future studies could explicitly test the moderating role of complementary capabilities (e.g., digital literacy, data analytics skills) on the SMA performance relationship. Finally, replicating this model in other industrial sectors (beyond tourism or culinary) and different national contexts would be valuable to assess the generalizability of these findings, particularly regarding the powerful influence of environmental factors.

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