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Effects of Technological, Organizational, and Environmental Factors on Social Media Adoption*

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Abstract

Electronic commerce is becoming a significant hub for sourcing products/services which helps organizations to connect with potential customers and gain competitive advantages, though little empirical work focuses on small businesses operating in developing countries to date. Increasingly, companies are looking to utilize social media to connect with stakeholders and pursue several benefits. This study aims to investigate the technological, organizational, and environmental (TOE) factors that influence small- and medium-sized enterprises' (SMEs) social media (SM) adoption in developing countries. This study used a closed-ended questionnaire to collect data from randomly-selected respondents (owners, executives, and managers) from SMEs in Pakistan. SMART PLS version 3.2.8 was used for path analysis of 316 responses and for structural equation modeling. The research findings include the direct influence of TOE factors (relative advantage, interactivity, visibility, top management support, and institutional pressure) on SMEs' SM adoption, and in turn SM adoption also has a positive influence on SMEs performance. Moreover, the coefficient of determination of the study showed that 77.7% of the variation in SM adoption occurs because of TOE factors and 29.8% variation in SMEs occurred because of SM adoption. This paper has implications for practitioners and scholars interested in exploring the SM adoption and usage by SMEs.

Keywords: Small and Medium-Sized Enterprises, Developing Countries, Social Media Adoption, Institutional Pressure, Relative Advantage

JEL Classification Code: M37, O33

1. Introduction

In the present era of globalization, technology is considered a key factor for improving market competitiveness and the country's economic situation. Generally, large organizations seized on opportunities to pursue and achieve economies of scale due to sufficient resources. And small businesses always suffered because of the limited resources, but technological development plays a key role in making small- and medium-sized enterprises (SMEs) competitive and enables them to be sustainable. Therefore, it is essential to focus on the factors that influence the adoption of technologies (Das et al., 2020). Ahmad et al. (2018) argued that technology, like social media (SM), could easily be adopted by a large organization because it is already connected to the Internet. But SM can be used by SMEs because of the minimal technical requirements and cost-effectiveness. The company can use SM for organizational public relations and communications, which help them to understand consumers' needs and drive them to react proactively and effectively to those needs (Parveen et al., 2016). Besides, Nguyen and Luu (2020) identified the several factors influencing the adoption by

industry and argued that there are limited studies dedicated to developing countries. The success of any technology and its influences on firm performance necessitates being appropriately adopted by firms. As many firms invest in SM, it is critical to identify the drivers that are linked with the adoption of technologies. Moreover, the adoption of new media like SM has significantly shifted marketing strategy and focus, and SM is now considered an important element of a marketing strategy (Becker & Lee, 2019).

Prior studies showed that the technological, organizational, and environmental (TOE) framework had been a prevalent model in exploring several information system issues. Empirical findings that employed the TOE model in the context of SMEs confirmed that it is an appropriate framework that can be used to understand the technology-based adoption (Ahmad et al., 2018; Cao et al., 2018). Unlike other technology, SM is a highly open and publicly-oriented system, which has both pros and cons. Thus, there may be other TOE determinants that are more specific to SM, which might influence SM adoption by SMEs. Therefore, to fill this gap in the existing literature and to advance the overarching model that defines the antecedents and advantages of SM adoption, we employed TOE framework.

This research aims to investigate the factors linked with TOE that help the SM adoption by SMEs, though the degree to which SM benefits SMEs is still not clear. Few studies have investigated the use of SM to advance business practices and their effects on organizations' performance (Garg et al., 2020). Though past studies explored the effects of SM on SMEs, several areas remains unexplored, including antecedents of SMEs success, the use of digital platforms by SMEs, and the effects on SMEs survival (Olanrewaju et al., 2020). Thus, this study investigates the factors of SM adoption in SMEs mainly operating in developing countries.

2. Literature Review

2.1. Theoretical Background and Conceptual Development

Unlike existing work, Chatterjee and Kar (2020), Lee et al. (2016) and Wamba et al. (2017) used linear models with a technology acceptance model or united theory of acceptance and use of technology. Wong et al. (2020) argue that they ignore organizational and environmental factors. The TOE framework comprises three different context groups – technological, organizational, environmental. The technological context refers to both current and new technologies that are applicable to the organization. The organizational context refers to the features of the firm in terms of its size, managerial level, and scope. The

environmental context refers to the environment in which firms operate, referring to its competitors, government agencies, and the industry. Indeed, as the TOE framework is combining both human and non-human determinants into a single framework, this provides superior strength over traditional models such as technology acceptance model and united theory of acceptance and use of technology (Awa et al., 2017). Many papers have linked new technology adoption with the TOE dimensions of the firm and provided a bigger sketch of the drivers influencing technology adoption (Abed, 2020).

The empirical findings from research adopting the TOE model have ensured that it is a valuable model with which to comprehend the IT-based adoption of innovation, especially SM by SMEs (Tajudeen et al., 2018). In addition, based on Abed (2020) argument that very little empirical work has been dedicated to SMEs to date regarding SM adoption, he concludes that the TOE framework has a robust theoretical basis, strong empirical support, and has been employed to investigate the adoption of new SM technology. The TOE framework is consistent with the contingency theory, resource-based view theory, and diffusion of innovation theory (Ahmad et al., 2018). This study employed some of the general TOE factors and also included specific drivers that are unique to SM and explored their influence on SM adoption (refer Figure 1)

2.2. Hypothesis Development

2.2.1. Technological Characteristics and SM Adoption

This study used three characteristics – relative advantage, interactivity, and visibility – of technology to be adopted. The relative advantage is the extent to which potential adopters consider innovation better than the alternative. Pee (2018) stated that awareness of the relative advantage of the enterprises' SM is beneficial to improve knowledge sharing and overall organization performance. Interactivity is the extent to which two or more parties can interact with each other using technology. SM is an innovative technology as it provides ways to increase the interaction between customers and organizations (Kizgin et al., 2020). Visibility is the extent to which something attracts general attention. Due to limited resources, SMEs are required to use and leverage SM for marketing activities as it provides them more visibility in contrast to large organizations (Braojos-Gomez et al., 2015). Past studies largely focus on the relative advantage, compatibility, and cost-effectiveness as predecessors of the technology adoption (Olanrewaju et al., 2020). Cesaroni and Consoli (2015) argue that the adoption of SM and its usage can provide organizations with higher visibility, interactivity, and cost-effectiveness. Thus, we proposed the following hypotheses:
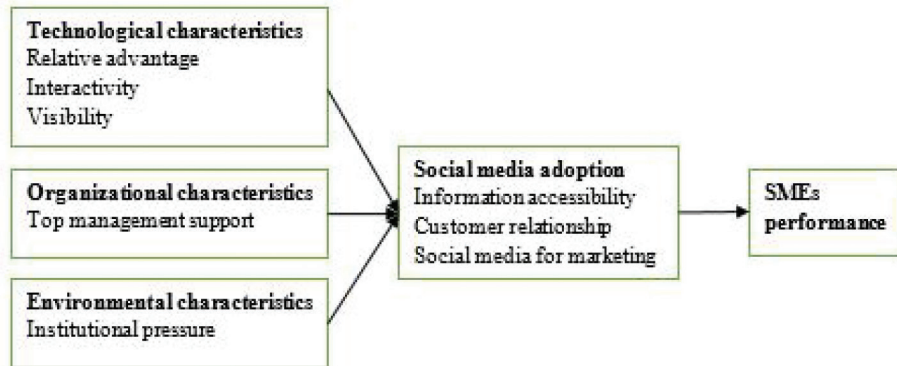
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Figure 1: Conceptual framework

H1. *Relative advantage have a significant influence on SM adoption in SMEs*

H2. *Interactivity has a significant influence on SM adoption in SMEs*

H3. *Visibility has a significant influence on SM adoption in SMEs*

2.2.2. Organizational characteristic and SM Adoption

The organizational construct includes internal characteristics of firms such as number of employees, size, turnover, managerial structure, and related issues. This study used top management and entrepreneurial orientation characteristics. The existing literature grounded on innovation largely focuses on top management as the main factor for varying the norms, values, and culture within the firms; in turn, this allows other internal stakeholders to adapt to the new technology (Olanrewaju et al., 2020). SM provides not only the advantages, but also disadvantages, which hinder top management choice to adopt SM. Some of the negative sides of SM adoption include the employees' waste of time and negative posts from dissatisfied customers, which can affect organization reputation (Ahmad et al., 2018). Furthermore, SM adoption requires continuous monitoring and well-educated and trained staff (Tajudeen et al., 2018). Maduku et al. (2016) found a significant relationship between top management support and mobile marketing adoption intention in African SMEs. Therefore, we hypothesize the following:

H4. *Top management support has a significant influence on SM adoption in SMEs*

2.2.3. Environmental Characteristics

This study used institutional pressure as a key factor in environmental characteristics. The institutional theory was found to be relevant in this research. This theory states that

environmental factors like institutional pressures drive firms to adopt innovations (Henderson et al., 2012). The institutional pressure defines the pressure that comes from the external environment that can persuade organizations to adopt general practices (DiMaggio & Powell, 1983). The stakeholders that may pressurize the firms to adopt SM includes potential customers, government agencies, and competitors. Past studies also used an institutional approach to investigate SM usage (Tajudeen et al., 2018). Thus, we proposed the following hypothesis:

H5. *Institutional pressure has a significant influence on SM adoption in SMEs*

2.2.4. Social Media Adoption and SMEs Performance

SM is a place for emotional expression, social activism, two-way communication, friendship development, and news updating. From an individual perspective, it is an e-space to share photos, update daily information, and drive a sense of belonging and self assurance (Nguyen, 2018). Whereas from an organizational viewpoint little is known. This study also investigated the influence of SM adoption on SMEs. The past scholarship outlined the importance of SM adoption in improving firm performance (Abu Bakar et al., 2019; Garg et al., 2020) and also it tested the association between SM and firm performance. The organizational usage of SM (Facebook) has an impact by improving customer relationships, information accessibility, and marketing (Ainin et al., 2015). Muafi (2020) argued that SM network offers a platform for knowledge sharing, innovation, and enhancement of SMEs' performance. Also, it improves the productivity of SMEs and increases their competitiveness (Potluri & Vajjhala, 2018). Moreover, with the growing expansion of social networking sites, it is important for all sizes of firms to protect the reputation of organization and brands. Thus, it is essential for the companies to adopt SM to improve reputation (Lee & Kwag, 2017). Olanrewaju et al. (2020) suggested that the SM adoption-SME performance link should be investigated in a more holistic manner using

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a longitudinal approach. Therefore, the current study aims to provide more robust empirical evidence by using a time-lag approach. In summary, we hypothesize:

H6. *SM adoption has a significant influence on SMEs' performance.*

3. Methodology

3.1. Sample and Data Collection

The critical respondents targeted were owners, executives, and managers, as they were considered to be the most well-informed about the organization's performance and environment (Zieba et al., 2016). A closed-ended questionnaire was used for data collection. Data collection occurred from May 2019 to October 2019 in the four regions of Pakistan – Sindh, Punjab, Baluchistan, and Khyber Pakhtunkhwa. The reason for collecting data in six months' lag time was to mitigate common method bias (Khan et al., 2019). In total, 316 valid responses were used for the analysis.

3.2. Measures

The five-point Likert scale (1=" strongly disagree"; 5="strongly agree") was used to record responses. The technological construct was assessed as follows: relative advantage – seven items were adapted from Ahmad et al. (2018); interactivity – three items were adapted from Ainin et al. (2015); visibility – three items were adapted from Dutot and Bergeron (2016). The top management support was assessed using four items from Ahmad et al. (2019). The institutional pressure was measured by adapting six items from Tajudeen et al. (2018). Specifically, SM adoption was assessed using 13 items – marketing (four items), customer relations and services (six items), and information accessibility (three items) adapted from Parveen et al. (2016). SMEs' performance was assessed using seven items from Cao et al. (2018) and Parveen et al. (2016).

4. Results and Discussion

4.1. Respondents and SMEs Information

Table 1 shows that, out of 316 respondents, 230 (72.7%) were male and 86 (27.3%) were female. Most respondents 110 (34.8%) were aged between 26 and 35 and had a master's degree 143 (45.2%). Thus, most decision-makers were young and well-educated. The majority of respondents were managers (41.8%), followed by executives (34.8%). Regarding company size, 176 (55.7%) had between 11 and 50 employees. The sample contained firms from diverse sectors, including business-related firms, professional services providers, information and

communication technologies, restaurants and event organizers, and logistics; most of them 147 (46.5%) were business-related. Regarding SM usage, 132 (41.7%) respondents admitted that SM use was minimal, reflecting a lack of interest, trust, and technical knowledge. However, the extensive use of SM as a marketing tool was revealed by other results for SM adoption ["A lot", 116 (36.7%); and "Extensive", 113 (35.7%)]. Regarding budget allocation, most respondents (284) allocate less than 25% to SM. Most SMEs 139 (44.0%)] were operating in Sindh, and 110 (34.8%) were using Facebook.

This study employed partial least square structural equation modeling to test the hypothesize model given its widespread application in business management and related disciplines, and it is considered the most fully developed and comprehensive system of variance. This study employs the full collinearity approach, specifically the variance inflation factor (VIF) for detecting evidence on common method bias (CMB) (Ahmed et al., 2020). The results of the study (Table 2) show that CMB is not a key concern since the computed VIFs are less than 5 (Hair et al., 2011). This study used a two-step approach evaluation of the measurement model and the structural model (Hair et al., 2010; Tian et al., 2020).

4.2. Evaluation of Measurement Model

At first, data were analyzed by assessing the central tendency and dispersion, followed by measuring validity and reliability (refer to Table 2). The reliability of the scales was measured using Cronbach's alpha (CA). According to Nunnally (1978), the CA values should exceed 0.7. After that, principle components analysis on each item was conducted. Afterward, convergent validity was projected (Li et al., 2020). Internal consistency reliability requires composite reliability (CR) to be ≥0.7 (Qalati et al., 2020). Regarding convergent validity, Fornell and Larcker (1981) recommended that the average variance extracted (AVE) should be ≥0.5 (Table 2). Table 2 shows the item loadings, weights, p-values, CA, CR, AVE, and Inner VIF to assess the reliabilities, internal consistency, convergent validity, and common method bias.

Regarding discriminant validity (see Table 3), the square of AVE for each variable must exceed the inter-correlation of the variables (Fornell & Larcker, 1981).

4.3. Evaluation of Structural Model

According to Wong (2013), the structural model should be used to assess the linear regression effects of the dependent variables on one another. This paper used PLS bootstrapping with 5000 bootstraps and 316 cases for demonstration of results related to paths and their significance level. Table 4 presents the comprehensive evaluations from the structural model. Figure 2 also illustrates the path coefficients and their level of significance.

Table 1: Demographical statistics of respondents and SMEs'.

		Frequency	Percentage
Gender	Male	230	72.7
	Female	86	27.3
Age (years)	Less than 25	36	11.4
	26–35	110	34.8
	36–45	94	29.7
	Over 50	76	24.0
Education	Basic/secondary	13	4.1
	Undergraduate	99	31.4
	Master's	143	45.2
	Other	61	19.3
Position	Owner	74	23.4
	Executive	110	34.8
	Manager	132	41.8
No. of employees	Less than 10	58	18.3
	11–50	176	55.7
	51–250	82	26.0
Demographical statistics of SMEs'			
Industry sector	Business-related (manufacturing, services, construction)	147	46.5
	Professional services	45	14.2
	ICT	71	22.5
	Restaurants and events	32	10.0
	Logistics	21	6.7
Firms level of utilization of social media	Minimum	132	41.7
	Basic	104	33.0
	Moderate	55	17.3
	Extensive	25	8.0
Use of SM as a marketing tool	Minimal	57	18.0
	Little	30	9.5
	A lot	116	36.7
	Extensive	113	35.8
Budget allocated	Less than 25%	284	90.0
	26–50%	17	5.3
	Over 50%	15	4.7
Location of the business	Sindh	139	44.0
	Baluchistan	37	11.7
	Punjab	92	29.1
	Khyber Pakhtunkhwa	48	15.2
Social media platform used	Facebook	110	34.8
	Twitter	18	5.7
	LinkedIn	62	19.6
	WhatsApp	92	29.1
	YouTube and other	34	10.8

Table 2: Evaluation of measurement model

|	Item code	Loadings	CA	CR	AVE	VIF
Relative	RA1	0.766	0.952	0.961	0.778	2.851
advantage	RA2	0.872				
	RA3	0.913				
	RA4	0.900				
	RA5	0.915				
	RA6	0.913				
	RA7	0.886				
Interactivity	I1	0.911	0.868	0.919	0.791	2.71
	I2	0.871				
	I3	0.886				
Visibility	V1	0.925	0.906	0.941	0.842	2.604
	V2	0.918				
	V3	0.910				
Top management	TMS1	0.917	0.935	0.954	0.837	1.992
support	TMS2	0.919				
	TMS3	0.911				
	TMS4	0.914				
Institutional	IP1	0.801	0.873	0.904	0.612	2.110
pressure	IP2	0.785				
	IP3	0.795				
	IP4	0.717				
	IP5	0.796				
	IP6	0.796				
Social media adoption			0.948	0.955	0.618	1
Customer	CR1	0.745	0.888	0.915	0.642	
relationship	CR2	0.725				
	CR3	0.772				
	CR4	0.813				
	CR5	0.754				
	CR6	0.726				
Information	IA1	0.800	0.961	0.974	0.927	
accessibility	IA2	0.811				
	IA3	0.822				
Social media	SMM1	0.812	0.944	0.959	0.855	
marketing	SMM2	0.811				
	SMM3	0.822				
	SMM4	0.797				
SMEs'	P1	0.831	0.935	0.947	0.718	
performance	P2	0.875				
	P3	0.862				
	P4	0.839				
	P5	0.861				
	P6	0.843				
	P7	0.819				

Table 3: Discriminant validity.

	1	2	3	4	5	6	7
Institutional pressure	*0.782*						
Interactivity	0.581	*0.89*					
Relative advantage	0.619	0.748	*0.882*				
SMEs' performance	0.489	0.461	0.457	*0.848*			
Social media adoption	0.688	0.719	0.74	0.546	*0.786*		
Top management support	0.624	0.603	0.595	0.478	0.777	*0.915*	
Visibility	0.645	0.694	0.709	0.464	0.757	0.601	*0.918*

Note: * Values on the diagonal (bold and italic) are the square root of the AVE while the off-diagonals are correlations

Table 4: Path coefficient and hypotheses testing.

Hypothesis	Relationship	Path coefficient	SD	*t*-value	Decision
H1	Relative advantage → SM adoption	0.183	0.053	3.472**	Supported
H2	Interactivity → SM adoption	0.118	0.047	2.492***	Supported
H3	Visibility → SM adoption	0.245	0.064	3.807**	Supported
H4	Top management support → SM adoption	0.381	0.075	5.067**	Supported
H5	Institutional pressure → SM adoption	0.111	0.055	2.011***	Supported
H6	SM adoption → SMEs' performance	0.546	0.054	10.105**	Supported

Note: Critical values. ** t-value > 2.58 (p < 0.01), *** t-value > 1.96 (p < 0.05)
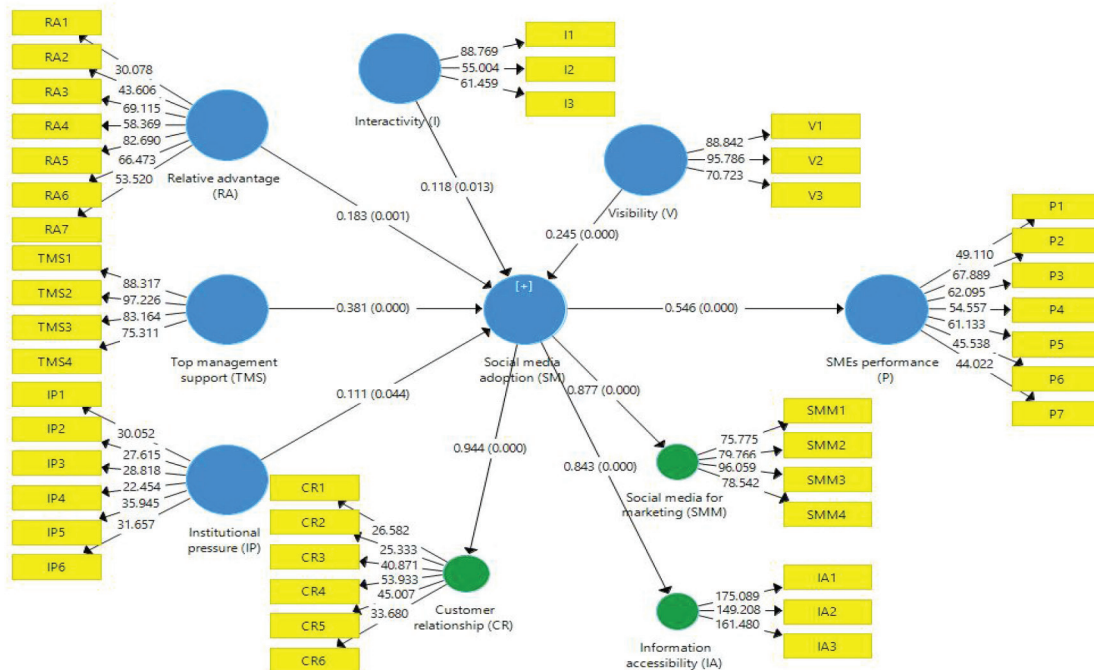
Figure 2: Structural equation modeling

Table 5: Structural model.

Construct	Cross validated redundancy			Coefficient of determination		SRMR
	SSO	SSE	Q²(=1–SSE/SSO)	R²	Adj. R²	
SM adoption	4,108.00	2,278.648	0.445	0.777	0.774	0.070
SMEs' performance	2,212.00	1,778.944	0.196	0.298	0.295	

According to Cohen (1988), R^2 values of 0.60, 0.33, and 0.19 are, respectively, substantial, moderate, and weak. In the present study, the R^2 value of 0.777 indicates that 77.7% of the variation in SM adoption occurred because of TOE factors, while 29.8% of the variation in SMEs' performance occurred because of SM adoption (refer Table 5). In addition, this study employed the cross-validated redundancy measure (Q^2) to evaluate the model. Henseler et al. (2009) suggested that $q^2>0$ shows that the model has predictive relevance. Values of 0.02, 0.15, and 0.35, respectively, indicate that an exogenous construct has a small, medium, or considerable predictive relevance for a specific endogenous construct. The current study's model has considerable predictive relevance for SM adoption and medium predictive relevance for SMEs' performance (Table 5).

Hair et al. (2011) propose the standardized root means square residual (SRMR) to assess the goodness of fit. SRMR is an absolute measure of fit: a value of zero indicates perfect fit, and a value less than 0.08 is considered a good fit (Hu & Bentler, 1999). Table 5 demonstrates the study's adequate goodness of fit.

This study highlights a number of TOE factors influencing SMEs' social media adoption. The results of the study interestingly stated that the relative advantage is found to be relevant in SMEs SM adoption decision (p=0.001); thus, H1 is supported. These findings are consistent with Ainin et al. (2015). The interactivity of SM adoption is considered a vital factor (p=0.013); therefore, H2 is supported. The results imply that SM offers an interactive platform that enable SMEs to have two-way communication with customers and business partners, which encourages enterprises to adopt it. These findings are in line with Alalwan (2018). Due to limited resources, visibility is also found significant for SMEs (p=0.001); thus, H3 is supported. These findings are consistent with Braojos-Gomez et al. (2015).

Top management support was found to be one of the essential factors in SMEs' decision to adopt SM (p=0.001); hence, H4 is supported. This finding is consistent with Ahmad et al. (2019). The results suggest that top management is keen on SM adoption and that employees are required to use SM extensively as a marketing tool. Another significant factor of SMEs SM adoption was institutional pressure (p=0.044); hence, H5 is supported. The results imply that pressure from the external environment has a positive influence on SM adoption. These findings are consistent with previous research, which argued that institutional pressure is one of the key factors of technology adoption (Tajudeen et al., 2018).

Lastly, the result of the study also demonstrates that SM adoption and usage have the strongest effects on SMEs' performance (bets=0.55, p=0.001) in terms of improving customer and service quality, cost reduction, and enhance information accessibility. Thus, H6 is supported. This result is found to be consistent with Cao et al. (2018 and Parveen et al. (2016).

5. Conclusion

This study investigated the impacts of SM adoption on SMEs' performance in developing countries, specifically Pakistan. The findings suggest that SM has a significant effect on SMEs' performance. Despite this substantial impact, budget allocation remains less than 25%. Furthermore, 41.7% of SMEs studied only used SM minimally for marketing. This paper suggests that SM enables SMEs operating in developing countries to connect effectively with customers, business partners, and other stakeholders on a more personal level because SM facilitates direct communications and immediate replies. Most importantly, this work highlights that SM adoption allows SMEs to build brand awareness and loyalty, improve customer relationships, and provide several benefits, including cost-effectiveness, relative advantage, visibility, and interactivity so that they can adjust to market conditions with limited resources. Ultimately, the proposed constructs provide a more detailed understanding of SM adoption for SME decision-makers.

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