Effects of Technological-Organizational-Environmental (TOE) Factors on Social Media Adoption in Small and Medium Enterprises

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This study aims to investigate the technological-organizational-environmental (TOE) factor of influencing 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 operating in Pakistan. SMART PLS version 3.2.8 was used for path analysis of 423 responses. The research findings include the direct influence of TOE factors on SMEs SM adoption and SMEs performance. Furthers, this paper also has implications for practitioners and scholars interested in exploring the SM adoption and usage in SMEs.

Keywords:

Small and medium-sized enterprises; developing countries; TOE factors; social media adoption; institutional pressure; top management support; relative advantage; interactivity; visibility.

1. Introduction

In the present era of globalization, technology has been considered a key factor for improving market competitiveness and the country's economic situation. Most 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 SMEs competitive and enables them to sustain. Therefore, it's essential to focus on the factors which influence the adoption of technologies [1]. [2] 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's use of SM is varying the organizational public relations and communications, which helps them to understand consumers' needs and drive them to react proactively and effectively to those needs [3]. For the success of any technology and its influences on firm performance, it 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.

Prior studies illustrated that the TOE framework had been a prevalent model in exploring several information system issues. Empirical findings from the prior studies that employed the TOE model in the context of SMEs confirmed that it is an appropriate framework which can be used to understand the technology-based adoption [2][4]. Unlike other technology, SM is a highly open and public-oriented system, which has both pros and cons. Thus, there may be other TOE determinants that are more specific to SM that might influence SMEs to adopt SM. 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 context that helps to SM adoption in SMEs as the degree to which SM benefits the SMEs is still not clear. And few studies have investigated the use of SM to advance business practices and their effects on organizations' performance [5]. Though, past studies explored the effects of SM on SMEs, but several areas remains unexplored, including antecedents of SMEs success, the use of digital platforms by SMEs and the effects on SMEs survival [6]. Thus, this scholarship also explore the advantages linked with SM adoption in SMEs.

2. LITERATURE REVIEW

2.1 Theoretical background

Unlike existing work, [7][8] used liner models with a technology acceptance model or united theory of acceptance and use of technology [9] argue that they ignore organizational and environmental factors. The TOE framework comprises of technological-organizational-environmental three different context groups. The technological one elaborates both current and new technologies that are applicable to the organization. The organizational 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 its industry. Indeed, as the TOE framework has combined both human and non-human determinants into a single

framework, this renders superior strength over traditional models such as technology acceptance model and united theory of acceptance and use of technology [10]. 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 [11]. 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 in SMEs [12]. In addition, based on [11] argument that very little empirical work dedicated to SMEs to date regarding SM adoption and conclude that TOE framework has a robust theoretical basis, strong empirical support and has been employed to investigate the adoption of new technology SM. The TOE framework is consistent with the contingency theory, resource-based view theory, and diffusion of innovation theory [2]. 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)
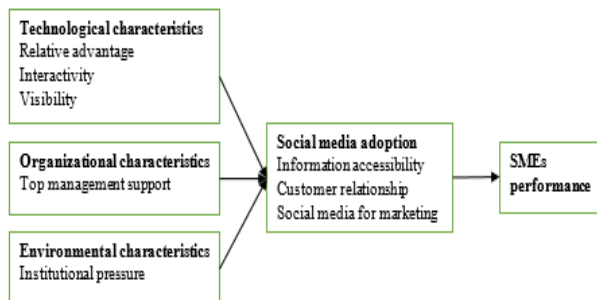
Fig 1. Conceptual framework

2.2 Hypotheses development

2.2.1 Technological characteristics and SM adoption

This study used three characteristics (relative advantage, interactivity, and visibility) of technology to be adopted. Relative advantage is the extent to which potential adopters consider innovation as better than the alternative. [13] 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 [14]. Visibility is the extent to which something attracts general attention. Due to limited resources, SMEs' is required to use and leverage SM for marketing activities as it provides them more visibility in contrast with large organizations [15]. Past studies largely focus on the relative advantage, compatibility, and cost-effectiveness as predecessors of the technology adoption [6]. [16] 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

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 several employees, size, turnover, managerial structure, related issues. This study used top management and entrepreneurial orientation characteristics. The existing literature grounded on innovation largely focus 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 [6]. 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, negative posts of dissatisfied customers, which can affect organization reputation [2]. Furthers, SM adoption requires continuous monitoring, well-educated and trained staff [12]. [17] 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 scholarship. This theory stated that environmental factors like institutional pressures drive firms to adopt innovations [18]. The institutional pressure defines the pressure that comes from the external environment that can persuade organizations to adopt general practices [19]. 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 [12]. Thus, we proposed the following hypothesis

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

2.2.4 Social media adoption and SMEs performance.

This study also investigated the influence of SM adoption on SMEs. The past scholarships outlined the importance of SM adoption in improving firm performance [20] and also 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 [21]. [6] suggested that the SM-adoption–SME-performance link should be investigated in a more holistic manner using 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 study sample was randomly selected from SMEs listed by Pakistan's SMEDA, and their online existence was confirmed using the well-known and authorized Pakistani websites businesslist.pk and mustakbil.com [22][23].

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 [24]. A closed-ended questionnaire was used for data collection. Data collection occurred from May 2019 to October 2019 in all 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 [25]. In total, 650 questionnaires were distributed, resulting in 423 valid responses.

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 adapted from [2]; interactivity [three items adapted from [21]; and visibility [three items from [26]. The top management support was assessed using four items from [27]. The institutional pressure was measured by adapting six items from [12]. Specifically, SM adoption was assessed using 13 items [SM for marketing (four items), customer relations and services (six items), and information accessibility (three items)] adapted from [3]. SMEs' performance was assessed using seven items from [3][4].

4. RESULTS

4.1 Respondents and SMEs information

Table 1 demonstrates that out of 423 respondents, 77.54% (328) were male, and 22.46% (95) were females.

Most respondents [161 (38.0%)] were aged between 26 and 35 years and had a master's degree [184 (43.49%)]. Thus, most decision-makers were young and well-educated. The majority of respondents were managers [171 (40.42%)], followed by executives [145 (34.27%)]. Regarding company size, 231 (54.60%) had less than 50 employees (small businesses), followed by 108 (25.53%) medium-sized companies. The sample contained firms from diverse sectors, including business-related firms, professional services providers, information and communication technologies, restaurants and event organizers, and logistics, with most companies [205 (48.46%)] run by the business owner. Regarding SM usage, 182 (43.02%) 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", 160 (37.82%); and "Extensive", 151 (35.69%)]. Regarding budget allocation, most respondents [385 (91.01%)] allocate less than 25% to SM. Most SMEs [184 (43.26%)] were operating in Sindh, and 146 (34.51%) were using Facebook

Table 1. Demographical statistics of respondents and SMEs'.

		Frequency	%
Gender	Male	328	77.5
	Female	95	22.5
Age (years)	Less than 25	52	12.3
	26–35	161	38.1
	36–45	95	22.5
	Over 50	115	27.2
Education	Basic/secondary	19	4.5
	Undergraduate	126	29.8
	Master's	184	43.5
	Other	94	22.2
Position	Owner	107	25.3
	Executive	145	34.3
	Manager	171	40.4
No. of employees	Less than 10	84	19.9
	11–50	231	54.6
	51–250	108	25.5
Demographical statistics of SMEs'			
Industry sector	Business-related (manufacturing, services, construction)	205	48.5
	Professional services	57	13.5
	ICT	89	21.0
	Restaurants and events	38	9.0

	Logistics	34	8.0
Firms level of utilization of social media	Minimum	182	43.0
	Basic	135	31.9
	Moderate	78	18.4
	Extensive	28	6.6
Use of SM as a marketing tool	Minimal	73	17.3
	Little	39	9.2
	A lot	160	37.8
	Extensive	151	35.7
Budget allocated	Less than 25%	385	91.0
	26–50%	24	5.7
	Over 50%	14	3.3
Location of the business	Sindh	183	43.3
	Baluchistan	56	13.2
	Punjab	131	31.0
	Khyber Pakhtunkhwa	53	12.5
Social media platform used	Facebook	146	34.5
	Twitter	22	5.2
	LinkedIn	93	22.0
	WhatsApp	118	27.9
	YouTube	19	4.5
	Other	25	5.9

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). The results of the study shown in Table 2, stated that CMB is not a key concern since the computed VIFs are less than 5 [28]. This study used a two-step approach evaluation of the measurement model and the structural model [29]

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 [30], the CA values should exceed 0.7. After that, principle components analysis on each item was conducted. Afterward, convergent validity was projected. Internal

consistency reliability requires composite reliability (CR) to be ≥0.7. Regarding convergent validity, [31] recommended that the average variance extracted (AVE) should be ≥0.5 (Table II). Table 2 demonstrates the item loadings, weights, p-values, CA, CR, AVE, and Inner VIF to assess the reliabilities, internal consistency, convergent validity, and common method bias.

Table 2. Evaluation of measurement model

	Item code	Loadings	CA	CR	AVE	VIF
Relative advantage	RA1	0.75	0.94	0.95	0.73	2.62
	RA2	0.85				
	RA3	0.88				
	RA4	0.87				
	RA5	0.89				
	RA6	0.87				
	RA7	0.87				
Interactivity	I1	0.9	0.86	0.91	0.78	2.44
	I2	0.87				
	I3	0.89				
Visibility	V1	0.92	0.91	0.94	0.84	1.91
	V2	0.92				
	V3	0.91				
Top management support	TMS1	0.9	0.92	0.94	0.81	1.74
	TMS2	0.89				
	TMS3	0.9				
	TMS4	0.9				
Institutional pressure	IP1	0.77	0.87	0.9	0.6	1.93
	IP2	0.77				
	IP3	0.77				
	IP4	0.74				
	IP5	0.78				
	IP6	0.8				
Social media adoption			0.94	0.95	0.59	1
Customer relationship	CR1	0.73	0.88	0.91	0.62	
	CR2	0.74				
	CR3	0.74				
	CR4	0.78				
	CR5	0.75				
	CR6	0.72				
Information accessibility	IA1	0.73	0.91	0.95	0.85	
	IA2	0.79				
	IA3	0.81				
Social media marketing	SMM1	0.8	0.92	0.95	0.82	
	SMM2	0.8				

	SMM3	0.81				
	SMM4	0.79				
SMEs'	P1	0.82	0.94	0.95	0.73	
performance	P2	0.87				
	P3	0.87				
	P4	0.85				
	P5	0.87				
	P6	0.85				
	P7	0.84				

Regarding discriminant validity (see Table 3), that demonstrates the square of AVE for each variable must exceed the inter-correlation of the variables [31].

Table 3. Discriminant validity.

	1	2	3	4	5	6	7	8
Entrepreneurial orientation	0.82							
Institutional pressure	0.64	0.77						
Interactivity	0.7	0.52	0.88					
Relative advantage	0.79	0.55	0.74	0.86				
SMEs' performance	0.49	0.49	0.42	0.43	0.85			
Social media adoption	0.75	0.66	0.68	0.7	0.55	0.77		
Top management support	0.67	0.58	0.54	0.54	0.42	0.69	0.9	
Visibility	0.66	0.59	0.57	0.61	0.44	0.66	0.47	0.92
Note: Values on the diagonal (bold and italic) are the square root of the AVE while the off-diagonals are correlations								

4.3 Evaluation of structural model

According to [32], the structural model should be used to assess the liner regression effects of the dependent variables on one another. This paper used PLS bootstrapping with 5000 bootstraps and 423 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 4. Path coefficient and hypotheses testing.

Hypothesis	Relationship	Path coefficient	SD	t-value	Decision
H1	Relative advantage → SM adoption	0.20	0.04	4.37**	Supported
H2	Interactivity → SM adoption	0.164	0.04	3.80**	Supported
H3	Visibility → SM adoption	0.214	0.05	4.22**	Supported
H4	Top management support → SM adoption	0.301	0.06	5.23**	Supported
H5	Institutional pressure → SM adoption	0.163	0.05	3.19**	Supported
H6	SM adoption → SMEs' performance	0.55	0.05	11.69**	Supported
Notes: Critical values. ** t-value > 2.58 (p < 0.01)					

Fig 2. Structural equation modeling

According to [33], 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 0.71 indicates that 71.0% of the variation in SM adoption occurred because of TOE factors, while 30.0% 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. [34] 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).

[28] 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 [35]. Table 5 demonstrates the study's adequate goodness of fit.

Table 5. Structural model.

	Cross validated redundancy			Coefficient of determination		SRMR
Construct	SSO	SSE	$Q^2(=1-SSE/SSO)$	R^2	Adj. R^2	0.07

SM adoption	5,499.0	3,383.6	0.38	0.71	0.70	
SMEs' performance	2,961.0	2,371.2	0.20	0.30	0.298	

5. DISCUSSION

This study enlightens a number of TOE factors influencing SMEs' social media adoption. The results of the study found interesting stated that the relative advantage found to be relevant in SMEs SM adoption decision (p=0.001); thus, H1 supported. These findings of the study consistent with [21]. The interactivity of SM adoption is considered a vital factor (p=0.001); therefore, H2 supported. The results imply that it offers an interactive platform that enables SMEs to have two-way communication with customers and business partners, which encourages enterprises to adopt it. These findings of the study in line with [36]. Due to limited resources, visibility is also found significant for SMEs (p=0.001); thus, H3 supported. These findings are consistent with [15].

Top management support was found to be one of the essential factors in SMEs' decision to adopt SM (p=0.001); hence H4 supported. This finding is consistent with [27]. 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 found institutional pressure (p=0.001); hence H5 supported. The results imply that pressure from the eternal environment has a positive influence on SM adoption. These findings are consistent with prior scholarships, which argued that institutional pressure is one of the key factors of technology adoption [12]. In last, the result of the study also demonstrates that SM adoption and usage has the most strong 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 supported. This result of the study found to consist with [3][4].

5.1 Theoretical contribution

This paper makes several contributions to the existing literature of SME SM adoption in developing countries. The findings of the study generalizable to developing countries, specifically Pakistan and alike, where little literature is available.

This study extends current theory by adding to the TOE framework and linking it to the factors from the diffusion of innovation theory, then applying it to examine the growing phenomenon of SMEs SM adoption. Furthers, this research provides modest support to the literature by providing empirical help from the SM perspective with good explanatory power.

Past studies have either investigated the constructs individually or in a different dimension [2][4][6] or called for further empirical exploration regarding theory building and validation. This study, thus, offered a related and parsimonious approach (grounded on the TOE framework) for investigating this research phenomenon.

Few studies have focused on the SMEs SM adoption [3][5][6] and investigated the hypotheses similar to those in our study. Recently, scholars have examined the predecessors and outcomes of numerous IT systems. However, from the SM perspective, there is a need to examine SM adoption and its usage in the context of SMEs operating in emerging countries. Our study, therefore, employed an integrative framework to investigate the predecessors of SM adoption, their extent, and their effects on SME performance.

5.2 Practical contribution

The most widely utilized SM applications were social networking services. Before deciding which application(s) to adopt as part of their strategic plans, decision-makers must work closely with the most popular SM tools in their country, i.e., Facebook in Pakistan, WhatsApp in India, and WeChat in China.

SMEs' owners/managers in developing countries are seeking to improve marketing practices via SM adoption, which provides multiple tools to improve firm performance. However, owners/managers may not optimally maximize their SM presence if their goal does not encompass exploiting SM for marketing purposes. The most common media types used by firms are Facebook and WhatsApp; both were considered cost-effective. The speed, ease of use, interactive nature, and ability to reach large customers make SM essential for SMEs in developing countries like Pakistan. Engaging existing and prospective customers, creating and sharing content, and monitoring competitors' activities via SM are possible benefits for organizations that embrace SM marketing activities.

5.3 Limitation and future research

This study, like any research, has certain limitations, which highlight avenues for future research. From a broader perspective, there may be other predecessors and influence factors. Consequently, the involvement of only limited factors and associated elements may be considered a limitation. Also, the sample size and reach may be considered a limitation. Moreover, the model was tested in SMEs in a single country through a field survey.

The outcomes represent a snapshot at a particular time, but the effects of SM are volatile over time. Most firms involved were business (profit-based), professional services, and IT firms. The present work did not explore the association between SM adoption and the firm's strategic viewpoint. It would be interesting, therefore, to investigate the effects of strategies and leadership on SM adoption in SMEs. Forthcoming work could also investigate product-based and service-based SMEs separately, as well as large firms in developing countries. Finally, the mediating role of SM adoption should be explored.

6. 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, 37% of SMEs studied only used SM minimally for marketing.

This paper suggests that SM allows SMEs operating in developing countries to connecting effectively with customers, business partners, and other stakeholders on a more personal level because SM facilitates direct mentions 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 with limited resources. Ultimately, the proposed constructs provide a more detailed understanding of SM adoption for decision-makers in SMEs.

Conflicts of interest

The author has declared no conflicts of interest.

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