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Research Article

Social Media Engagement and SME Sustainability in Bangladesh: An Integrated TOE and TAM Framework

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Abstract

Small and Medium Enterprises (SMEs) are the vibrant and dynamic sector of world economy. SMEs employ social media (SM) to develop brand awareness, connect with consumers, and make sales at a nominal cost. This stakeholder interaction enables access to information. Sharing this information supports decision-making, which is key to SMEs' performance and sustainability. The objective of the study is to explore the factors of social media adoption that impact the SMEs' sustainability considering the TOE framework and TAM model in developing countries like Bangladesh. This study involved the TOE framework and TAM model as SM adoption factors that impact the sustainability of the SMEs. For the empirical examination, a closed-ended questionnaire has been used. A Google form questionnaire was used to gather information through an online survey. The respondents were selected randomly from Bangladeshi SMEs. A sample size of 231 respondents has been collected from SMEs' proprietors and officials. The findings of the research indicate a positive and significant relationship between relative advantage and compatibility of technological factors, top management support and cost effectiveness of organizational factors with SMEs' sustainability. This research helps SME firms identify the benefits of social media adoption and states the justification behind a firm's investment in social media. It develops an empirical, multidimensional hypothesized model, including several determinants that may influence social media adoption. This study includes various recommendations for decisionmakers of SMEs, policymakers in the country context, and SME interested scholars.

Keywords

Factors of Social Media Adoption, SME's Sustainability, Toe Framework, Tam Model

1. Introduction

Small and medium-sized enterprises (SMEs), the driving force of industrial development, have played a vital role in socio-economic development through innovation, women's empowerment, social connection, and poverty alleviation. There is no substitute for industrial development in a 170 million peoples' country [38, 57]. The growth rate of the Bangladeshi industrial sector slowed to 3.51% in the 2023-24 fiscal year from 5.78% in the previous year. This results in a significant decline from the previous year. Bangladesh, with 2.63 million unemployed people, holds 12th position among the 20 unemployment raising countries [14, 38, 48]. The percentage of unemployed people is increasing with the increasing rate of

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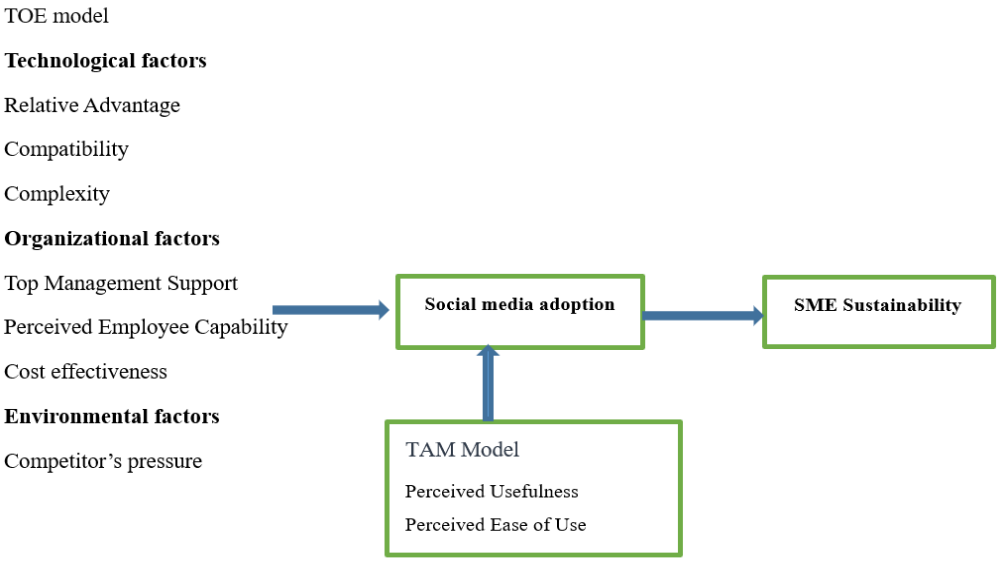
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higher education. Employment opportunity is not being created with the rate of country's economy is growing. SMEs have the opportunity to create employment [10, 40, 60]. This sector accounts for 90% of all industrial units, contributes 25% of GDP, and provides 30 to 35% of the workforce. This contribution is very low compared to China, India, Singapore, and Malaysia [27, 48, 57]. Though the contribution of SMEs is enormous to the economy, the SMEs faced the hurdles of engagement and using social media to compete with larger firms [8, 14, 32, 38].

In recent times, globalization has pushed enterprises to adopt modern technologies to compete and modernize, which expressively progresses business growth [4, 6, 8, 33, 70]. Engagement of SM in business operations is important for sustainable business growth. Businesses' adoption of new technologies is crucial for sustainable business growth. Contemporary technologies and the appearance of SM have redesigned business functions such as advertising, procedures, finance, and HRM functions and SM has assisted enterprises to achieve a competitive advantage [22, 28, 29, 70, 77].

SM is a strategic pioneering instrument to share information and develop long-lasting relationships with customers. Large firms used SM for advertising, market penetration, and interacting with possible customers to improve corporate success and to attain a relative advantage [22, 26, 28, 32]. SME faces obstacles with regards to limited resources and time constraints for SM adoption. Furthermore, insufficient technological knowledge, enactment procedures, and trust factors are assumed to contribute to the inability of SM adoption by SME firms [22, 23, 26, 46, 73]. SM has been used by around 30% of SMEs for gaining sustainability [57]. But in developing countries like Bangladesh, adoption of SM is low. Now, the potential owners of the SME firms adopt and carry on SM terminologies to gain sustainability [8, 32, 57]. For this, the adoption of SM in attaining sustainable performance is a discussion issue [9]. The adoption of SM plays a momentous role in SMEs' sustainable performance. A previous literature review has examined the relationship between SM adoption and the suatainability of SMEs in developed countries [4, 6, 14, 21-23, 25, 46, 73]. The adoption of SM can drive business growth through digital marketing and client communication. SM has a positive and significant effect on SME sustainability in developed economies [25, 28, 36, 56, 70, 77]. Therefore, the objectives of the study are to investigate the engagement of SM on the sustainable performance of SMEs in Bangladesh using the TOE framework and TAM model.



Source: Authors own creation

Figure 1. *Conceptual Framework.*

2. Literature Review

A literature review includes the listing of summaries through weaving sources together into a cohesive narrative or thematic structure.

2.1. Social Media Adoption

Social Media (SM) is a digital platform that serves as a virtual public space for networking and communication of content [7, 21, 33]. SM are different forms, such as social networking for communicating with friends and family (Face-

book), media sharing for visual content (Instagram), discussion & forum for discussing on specific issues (Reddit), and microblogging for rapid updates and news (Bluesky) [9, 39]. SM works as a communication medium through a computer that helps in the sharing of information and knowledge by social networking sites [32, 60]. It is also treated as a pathway for the distribution and development of information. SM is very inexpensive, easy, and can spread to the commons [4]. Therefore, SM is a very impressive tool for the performance of the SME firms [27]. SM supports SME firms to achieve a relative advantage through knowledge sharing, customer relationship management, and the development of firms' image. Former empirical research confirms that SMEs' SM adoption significantly affects firms' development [28, 29, 70, 77]. [38] provided evidence that adoption of SM has a positive influence on firms' performance in the SME context. [22, 29, 56] concluded that SM has a positive correlation with SMEs' growth and sustainability.

2.2. Theoretical Review

The Technology-Organization-Environment (TOE) framework posits that the adoption and use of new technologies are influenced by three predictors, namely technological, organizational, and environmental factors [14, 27, 57, 60]. These three factors serve as pillars that enable a business firm to assess the appropriateness of digitalization, cloud computing, and artificial intelligence adoption [7, 33, 57].

2.2.1. Technological Factors

The Technological factors of the TOE framework assess the influence of both the internal and the external technologies on a firm's assessment to implement a SM adoption [14, 39, 60]. The main technological factors are relative advantage, compatibility and complexity [23, 36, 77].

(i). Relative Advantage and SM Adoption

Relative advantage is the acceptance of innovation as better compared to existing alternatives. Relative advantage is the main driver of adoption, which is confirmed based on tangible benefits. Relative advantage which is an influencing consistent forecaster and determining factor of technology adoption. Previous studies identified that the decision to adopt innovation depends on the perceived advantage offered by the technology in the SME context. A study on 144 respondents conducted in the UAE found that among the factors of technological characteristics, relative advantage has no significant relationship with SM adoption [6]. A study on 107 UAE SME found that the factor, relative advantage is positively related with the decision of technology adoption in SMEs [3, 13, 50]. Relative advantage is also positively related with SM adoption in tourism sector [68]. Relative advantage of technological factors is significantly positive related with adoption of technology and performance in SMEs [12, 34, 35]. SMEs adopted technology due to its assistance in performance and sustainability [54]. Therefore, the hypothesis is:

H_1: Relative advantage has significantly positive relationship with SM adoption.

(ii). Compatibility and SM Adoption

Compatibility is the scope to which an innovation is accepted in similar with the present values, previous involvements, and requirements of the probable adopters. So, adoption of SM should be well-matched with the firm's social and cultural views and ethics [7, 50]. The compatibility of SMEs with social networking applications and sites means that the firms should be able to approve such advanced ways that perfectly match with prevailing beliefs of SMEs. SM is used in SMEs as a tool that develops success-related results in the different sectors of the companies. It contributes to corporate effectiveness that fascinates the number of consumers [21, 38, 73]. SMEs use SM to develop various perspectives of business to improve communication, supply chain management, and to spread information on a large scale with minimal cost [8, 15, 22, 54, 71]. SM marketing approach stimulus positively on performance and business growth [2]. Compatibility exists between current and recently accepted technology that should be accepted for achieving effectiveness and efficiency to the business [6, 73]. Thus, the research hypothesis:

H_2: Compatibility has a significantly positive influence on SM adoption.

(iii). Complexity and SM Adoption

The complexity, a technological factor, expresses that adoption of new technology depends on how cumbrous or problematic is it to use. The complexity factor influences the adoption of technology that must be easy to use and user-friendly [2, 3, 10, 30, 71]. Previous scholars also identified that the adoption of new technology would be very implausible if use of technology is supposed to be complex [10, 12, 19, 44]. Perceived complexity has a significantly positive influence on the adoption of new technology [15, 38, 43, 65]. Furthermore, further evidence of Pakistan showed that complexity has a significant influence on SMEs' social media adoption [11, 12]. Some researchers also identified that there is no relation between complexity and social media adoption [38, 69]. So, we suggest that:

H_3: Perceptions of complexity negatively influence SMEs' SM adoption.

2.2.2. Organizational Factors

The organizational factors encompass top management support, cost-effectiveness, and perceived employee capability that sharply dictate whether and how a business accepts social media.

(i). Top Management Support and SM Adoption

Management support is considered the key decision-

maker for the SMEs' successful adoption of social media. Management simplifies acceptance by distributing required funds, launching digital directions, and adopting a company-wide belief in modernization, which directly advances promoting capabilities and performance of the firms [1, 10, 18, 52, 65]. Management's assistance confirms that sufficient budgets are allocated for SM management tools and human resources training [66]. Positive administrative attitude stands in favor of digital initiatives, worker trepidations lessen and step forward towards SM marketing [73]. Management's assistance confirms that sufficient budgets are allocated for SM management tools and human resources training [13, 45]. Positive administrative attitude stands in favor of digital initiatives, worker trepidations lessen and step forward towards SM marketing [51, 56]. The support of the top management not only converts the adoption as indispensable part of core business objectives, but also helps in better customer retention and return on assets [21]. The prior authors showed a significantly positive influence of management on technology adoption in the SME context [65, 75]. The causal influencing factors of SM have a positive connection with the management of the SMEs [21]. Hence, we hypothesizes that:

H_4: Management support is positively influence on SMEs' adoption of SM.

(ii). Cost-effectiveness and SM Adoption

Adoption of new technology that is cost-effective for SMEs radically reduces the cost of customary promotion and direct conversation with clients. Social media platforms like Facebook and Twitter offer instant reach to clients that is an indispensable tool for business survival and growth [8, 54, 65, 73]. Low cost makes it more affordable than traditional marketing. Starting up a business page on Facebook or WhatsApp platform is almost free [22, 73]. Through social media, a firm can reach to the targeted audience with minimal costs that maximize the wealth of the organization. Furthermore, the manager of the firm can take feedback from customers [44, 53, 72]. The adoption of SM has a significantly positive impact on performance but cost-effectiveness does not have a positive impact on SM adoption [1]. Some prior researcher identified that cost-effectiveness has a significant influence on social media adoption [12, 24, 35, 50, 55]. Therefore, the research hypothesis is:

H_5: Cost-effectiveness has a significant positive influence on adoption of SM in SMEs.

(iii). Perceived Employee Capability and SM Adoption

Employee competence directly influences the success of SM adoption in the workplace. Employees with high digital literacy, they smoothly influence organizational stages for knowledge distribution and teamwork. On the other hand, competence gaps habitually lead to efficiency loss and safety risks [8, 14, 65]. Common digital knowledge and particular training regulate whether personnel can use organizational tools without resistance. Competence enables the employee to select right SM for the right task [21, 47, 54, 61]. Moreover, competence enables the employee to engage more confidently. A good number of previous studies showed a significant positive relation between employee capability and SM adoption [13, 50, 56, 70]. Employee capability is compulsory in conducting different complications of the technologies that have been implemented by SMEs. Furthermore, due to the shortage of knowledge of new adopted technology, the expected success faces obstacles in the SME context. So, the shortage of knowledge and expertise related to information technology impedes SM adoption of new technology in the SMEs [13, 56, 70]. [70] suggested that expertise of the employee significantly influences the adoption of new technology that helps to be successful and to survive in the market. So, we hypothesize that:

H_6: Employee capability has a significantly positive influence on SMEs' adoption of SM.

2.2.3. Environmental Factor

Environmental factors refer to the external pressures and industry surroundings, such as competitor pressure and market uncertainty, that impact whether a firm agrees to SM adoption.

Perceived Competitive Pressure and SM Adoption

SMEs repeatedly squeeze the social media platform to maintain market share against antagonists, suit industry standards, and ensure their visibility in the place where opponents are involved with consumers [10, 25, 34, 63]. Smaller firms are vulnerable to stiff opposition [16]. Antagonism inspires the SMEs to initiate and outsail others in the same industry [25, 64]. The SME firms adopted social media in a strong competitive market. Adoption of social media helps the SMEs to sustain in the competitive market and to enhance performance [24, 44, 68, 72]. Competitive pressure is positively related to social media adoption which helps to sustain in the competitive market and to perform better [20, 62]. Furthermore, some previous research identified that competitive pressure significantly influences technology adoption [12, 24, 35]. A positive influence exists between competitive pressure and social media adoption in Yemeni [41]. In case of China, Uganda, Indonesia, Kenia, competitive pressure and technology adoption are positively correlated [5, 12, 20, 49, 55, 64, 76]. So, we hypothesize that:

H_7: competitive pressure has a positively significant influence on SMEs' adoption of SM.

2.3. The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a theory of two criteria that decide whether a new technology is accepted by its prospective users, namely perceived usefulness and perceived ease of use [15, 27, 57, 60].

2.3.1. Perceived Usefulness and SM Adoption

Perceived usefulness (PE) means that it will expand business success. SMEs use SM to connect and to provide information to consumers, and it helps to enhance business performance significantly [17, 61]. SM will magnify sales performance by sharing information about the products, and with the help of SM, customers can compare different products in the same category [2, 29, 76]. PU is related to the profitability of SME firms. SM impacts positively on the success of SMEs by involving them with marketplace stakeholders. So, we hypothesize that:

H_8. Perceived usefulness positively influences SMEs' SM adoption.

2.3.2. Perceived Ease of Use and SM Adoption

The feature, perceived ease of use (PEU) of SM adoption, includes user attitudes, dropping access obstacles, and enhancing confidence [14]. PEU of SM adoption means the nominal effort to acquire the features, easy-to-use applications, and involve in different activities like sharing business related videos, sharing details and direct communicating with consumers [14, 76]. SMEs use SM to involve consumers with lower primary investment [17, 73]. SMEs' access through SM helps in smoothing commercial dealings. Prior studies identified that PEU positively influences SM adoption in SME sector [31, 37, 61]. So, we hypothesize that:

H_9. Perceived ease of use positively influences SMEs' SM adoption.

2.4. Social Media Adoption and SME Sustainability

Geurin, A. N., & Burch, L. M [36] defined sustainability as "Sustainability as a composition well-balanced financial resources, and environmental, technological, and socio-economic objectives." Technological advancement enhances SME firms not only in environmental sustainability but also in organizational sustainability through improving financial resilience, nurturing friendly consumer behaviors, and assembling in digital societies [18, 38, 43, 47, 66]. Social media adoption helps in behavioral change, information dissemination, and removes adoption barriers. It decreases promotion and communication costs for SMEs, increases unambiguous consumer response and brand loyalty, and expands existence rates and economic durability in digital markets [14, 17, 70]. SMEs adopted SM, an effective marketing tool, to attain better performance through real communication, though limited capability and resources. SMEs can innovate and contest with the larger organizations with the help of social media that impact firms' sustainability. Furthermore, a positive association exists between social media adoption and SMEs' sustainability performance [14, 21, 22]. Considering the above, an additional examination of SM adoption and SMEs' sustainability from an emerging economy perspective was hypothesized and confirmed. So, we hypothesize that:

H_{10}. Social media adoption positively influences SME sustainability.

3. Methodology

Methodology is the all-encompassing policy, structure, and logic behind a research process.

3.1. Sampling and Data Collection

We randomly selected respondents from SME firms. The researcher managed a web-based closed-ended questionnaire survey (created via Google Forms). The questionnaire link was distributed through social media platforms (WhatsApp) and individual emails to gather information from distributed respondents across the country. The researcher also used the direct questionnaire method. This study targeted only those SMEs in the trade industry, manufacturing industry and service industry. Around 500 questionnaires were sent to different SME firms to collect data. Among them, 295 questionnaires were returned, and 231 complete questionnaires were used for research analysis.

Table 1 indicates that 72.73 percent of responding firms' number of employee were below 25, 13.85 percent of firms had 25-50 employees, and 13.42 percent had 51- 150 employees. Most of the SME firms (91.34 percent) use Facebook. Around 63 percent SME firms use WhatsApp while only 15.15 percent use twitter. Around 18 percent firms use instagram.

Among the respondents, 85.71 percent respondents are owner of the firm while only 14.29 percent respondent are manager of the firm.

Table 1. *Demographic features.*

No of Employee	<25	168	72.73
	25 to 50	32	13.85
	51 to 150	31	13.42
Social Media Platform	Face book	211	91.34
	WhatsApp	145	62.77

	Twitter	35	15.15
	Instagram	42	18.18
	Others	10	4.329
Respondent	Owner	198	85.71
	Manager	33	14.29

Source: Researcher data collection

A well-established 5-point Likert scale (5 = strongly agree to 1 = strongly disagree) has been used to collect individuals' responses to five different alternatives [38, 58, 74]. This study includes the two framework, one is technology-organization-environmental (TOE) framework and another is the technology acceptance model. The relative advantage, compatibility, and complexity are included in the technological factors, and they are measured by 4 items. Top management support, perceived employee capability, and cost-effectiveness are included in the organizational factors and are measured by five different questions [40, 53, 67]. Another important factor, competitors' pressure, is included in the environmental factor. The competitors' pressure is measured by three different questions. The moderating variable, social media adoption, is measured by seven questions. The dependent variable, SME sustainability, was assessed by seven factors collected from previous articles [23, 27, 42].

3.2. Research Model

$$SMES = SMA = \alpha+\beta1RA+\beta2COM+\beta3COP+\beta4TMS+\beta5PEC+\beta6CE+\beta7CP+\beta8PU+ \beta9PEU +\varepsilon$$

SMES = SME Sustainability; SMA = Social Media Adoption; α = Constant; RA = Relative Advantage; COM = compatibility; COP = Complexity; TMS = Top Management Support; PEC = Perceived Employee Capability; CE = Cost Effectiveness; CP = Competitor's pressure; PU = Perceived usefulness; PEU = Perceived ease of use; ε = errors.

3.3. Sampling Adequacy

Table 2. *Test for Sampling Adequacy.*

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.560
Bartlett's Test of Sphericity	Approx. Chi-Square	12856.636
	df	2080
	Sig.	0.000

SmartPLS version 4.1.1.8 has been used here to calculate PLS-SEM. and its tools, algorithm, blindfolding, and bootstrapping to check the hypothesized model [10, 12, 30, 52, 67]. SmartPLS 4 delivers a contemporary examination of both structural and measurement models, which yields more accurate results [59]. Furthermore, IBM SPSS has also been used for descriptive statistics, and the KMO measures the sampling adequacy, which shows a value of 0.560, which is much higher than the acceptable threshold of 0.5 (Solomon et al., 2024). So, the sample size is adequate for the study.

4. Data Analysis

Common Method Bias (CMB)

The common method bias (CMB) denotes systematic variance introduced into measurement, considering identical collection technique and source. Identical survey or instrument is used for all the variables. The full-collinearity approach is a statistical method used initially in partial least squares structural equation modeling to test CMB [56]. The VIF (variance inflation factor) has been used here to measure the degree of

collinearity. VIF value equal to or greater than 5 means the presence of collinearity among the variables [2, 66, 73]. In this study, the VIF value is between one and two. Therefore, the data of this research is free from collinearity (see Table 3).

Table 3. *Outer loadings, Cronbach's alpha, Composite reliability (rho_a), Composite reliability (rho_c), AVE, VIF.*

Variables	Items	Mean	Standard deviation (STDEV)	Loadings	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)	VIF
Relative Advantage	RA2	4.465	0.603	0.745	0.783	0.763	0.617	1.059
	RA3	4.435	0.688	0.825				1.059
Compatibility	COM1	4.439	0.720	0.878	0.872	0.859	0.753	1.343
	COM2	4.450	0.705	0.857				1.343
Complexity	COP1	4.357	0.683	0.778	0.815	0.833	0.715	1.246
	COP3	4.426	0.706	0.908				1.246
Top management support	TMS2	4.309	0.690	0.854	0.797	0.832	0.713	1.221
	TMS4	4.391	0.806	0.835				1.221
Perceived Employee Capability	PEC1	4.409	0.692	0.888	0.775	0.860	0.754	1.351
	PEC2	4.339	0.819	0.849				1.351
Cost- effectiveness	CE2	4.282	0.767	0.788	0.700	0.830	0.710	1.225
	CE3	4.413	0.680	0.894				1.225
Perceived usefulness	PU1	4.565	0.682	0.867	0.923	0.841	0.726	1.257
	PU2	4.643	0.571	0.836				1.257
perceived easy of usefulness	PEU1	4.252	0.780	0.796	0.832	0.809	0.680	1.151
	PEU3	4.335	0.658	0.852				1.151
social media adoption	SMA3	4.400	0.637	0.791	0.835	0.804	0.578	1.351
	SMA4	4.483	0.710	0.759				1.336
	SMA5	4.574	0.569	0.730				1.154
SME sustainability	SMEP3	4.570	0.614	0.853	0.760	0.862	0.675	1.599
	SMEP4	4.639	0.602	0.796				1.477
	SMEP5	4.422	0.730	0.815				1.548
Competitors' pressure	CP1	4.400	0.721	0.812	0.753	0.817	0.691	1.171
	CP3	4.509	0.652	0.850				1.171

Table 4. *Heterotrait-Monotrait ratio (HTMT) – Matrix.*

	CE	COM	COP	CP	PEC	PEU	PU	RA	SMA	SMEP	TMS
CE											
COM	0.826										
COP	0.833	0.820									
CP	0.825	0.819	0.731								
PEC	0.627	0.846	0.616	0.844							

	CE	COM	COP	CP	PEC	PEU	PU	RA	SMA	SMEP	TMS
PEU	0.826	0.751	0.723	0.807	0.837						
PU	0.852	0.617	0.764	0.677	0.829	0.699					
RA	0.524	0.592	0.601	0.577	0.491	0.799	0.534				
SMA	0.643	0.722	0.851	0.833	0.759	0.814	0.793	0.551			
SMEP	0.840	0.746	0.832	0.831	0.835	0.358	0.850	0.647	0.832		
TMS	0.802	0.826	0.656	0.737	0.828	0.812	0.793	0.478	0.782	0.779	

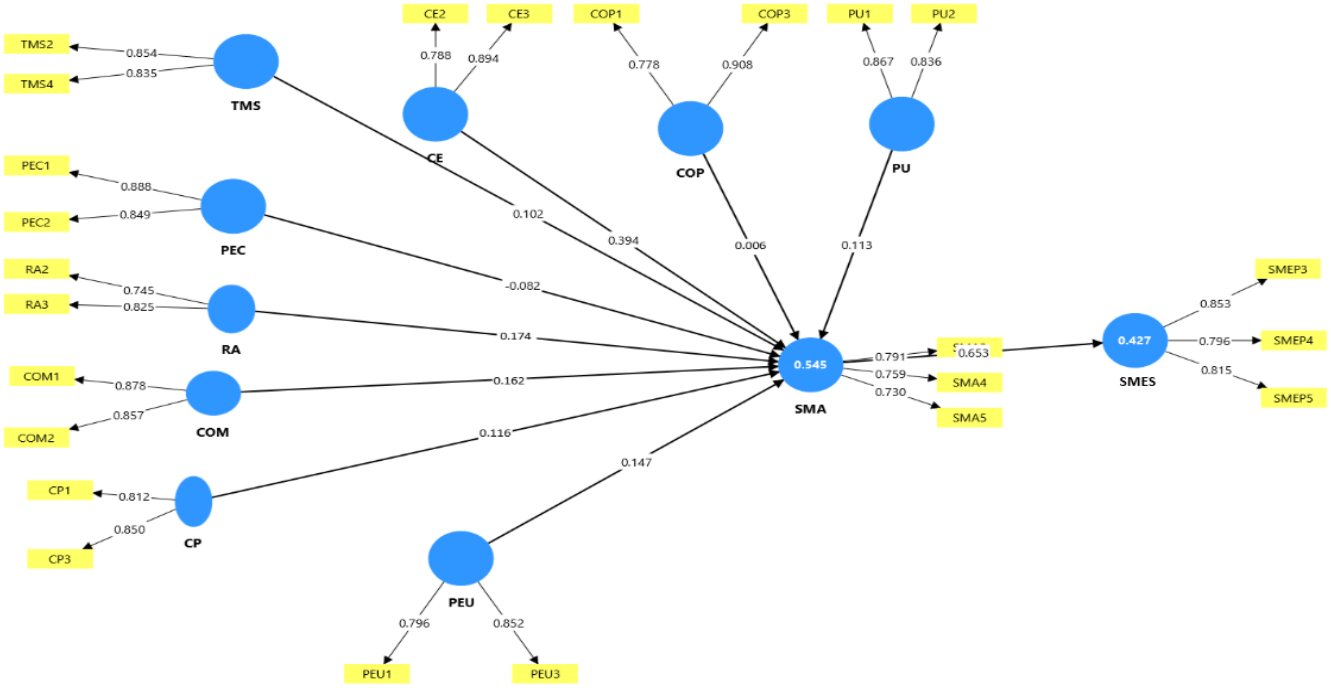


Figure 2. *Path Diagram.*

Table 5. *T value, P value, and Hypothesis decision.*

		Original sample (O)	Sample mean (M)	Path coefficients	Path coefficients	(STDEV)	T statistics	P values	decision
H5	CE -> SMA	0.394	0.389	0.394		0.072	5.444	0.000	Supported
H2	COM -> SMA	0.162	0.161	0.162		0.080	2.019	0.044	Supported
H3	COP -> SMA	0.006	0.009	0.006		0.069	0.089	0.929	Not Supported
H7	CP -> SMA	0.116	0.116	-0.116		0.072	1.609	0.108	Not Supported
H6	PEC -> SMA	-0.082	-0.075	0.082		0.077	1.058	0.290	Not Supported
H9	PEU -> SMA	0.147	0.145	0.147		0.059	2.497	0.013	Supported
H8	PU -> SMA	0.113	0.111	0.113		0.081	2.028	0.042	Supported
H1	RA -> SMA	0.374	-0.014	0.220		0.069	2.528	0.020	Supported

		Original sample (O)	Sample mean (M)	Path co-effi-cients	Path coeffi-cients	(STDEV)	T statistics	P val-ues	decision
H10	SMA -> SMEP	0.653	0.659		0.053	0.037	17.517	0.000	Supported
H4	TMS -> SMA	0.102	0.100	0.102		0.065	2.372	0.016	Supported

Note. Critical values. R-square = .545. Adjusted R-square =0.526; Goodness of fit summary = SRMR 0.079. *t-Value= greater than 1.96 (p = less than .05).

Table 6. *Construct cross-validated communality.*

	Q ²predict	RMSE	MAE	R-square	Adjusted R-square
SMA	0.482	0.727	0.532	0.545	0.526
SMEP	0.484	0.729	0.548	0.427	0.424

5. Outcomes and Analysis

5.1. Judgment of the Measurement Model

Appraisal of the measurement model encompasses the convergent validity of individual items of different variables. This measurement was evaluated through examination of factor loadings and the average variance extracted (AVE) [6, 10, 12, 38]. The value of AVE more than 0.5 propose sufficient convergent validity [44]. The value of all construct used in this research is more than 0.5. Therefore, the constructs having the value more than 0.5 were used in this research. The composite reliability (CR) and Cronbach's alpha (CA) have been used to assess reliability. The recommended assessment for composite reliability and CA is 0.7 and more [22, 56, 70]. The composite reliability (CR) and Cronbach's alpha (CA) values for this study were greater than the suggested values for both measures (Table 3). In this study, the heterotrait-monotrait ratio (HTMT) test is also used, and the suggested value for discriminant validity is 0.85 or less [47, 58, 76]. The HTMT value for this study has satisfied the threshold limit (Table 4).

5.2. Measurement of the Structural Model

Before measuring the structural model of this study, variance inflation factors was employed for finding evidence of CMB. The results of the CMB conveyed in Table 2, indicate that the results are within the tolerable threshold. Formerly, the PLS (partial least squares) technique called bootstrapping was used, and 5000 bootstraps with 231 selected samples were used to assess the association between SME sustainability and numerous influencing factors of SM adoption, bearing in mind the standards of t-value and p-value. The end result discloses that the manipulating factors of SM adoption significantly impact SME sustainability with the exception of some variables (Table 5).

The result of the path coefficient, R-square is .545 or 54.5 percent. The suggested result of R-square is 0.19 considered as weak, 0.33 as sensible and 0.60 as adequate [14, 47]. The result of r square is about to adequate. Additionally, the researcher considered the cross-validated redundancy measure (Q^2) to evaluate model changes. The suggested value of Q2 is more than 0, that identify that the model has predictive relevance [13, 70]. Q square establishes the predictive relevance of endogenous constructs. In this research, the value of q square above zero indicates the values are well reconstructed, and the model has predictive relevance. SME sustainability and SM adoption have predictive relevance (Table 5). To test the goodness of model fit, this study used SRMR, with a suggested value of less than 0.08, which is considered a good fit; 0 value specifies a perfect fit [8, 43, 47]. The SRMR result of this study is 0.079, which is satisfactory.

6. Discussion of Results

The quantitative analysis ascertains the SM factors that impact the sustainability of SMEs in Bangladesh. Here, the TOE framework and TAM model have identified the factors of SM. The examination detects that technological, organizational, and environmental factors of the TOE framework and perceived usefulness and perceived ease of use of the TAM model impact on the sustainability of SMEs. Adoption of SM is very much customer-focused and carries changeable performance for the sustainability of SME. This study delivers a comprehensive understanding of the impact of SM in the SME

context.

The outcomes of this study specify that the relative advantage factor has a significant influence on SME adoption (Table 5; p = 0.020), so the hypothesis H_1 is acknowledged. This outcome shows similarity with the earlier research [6, 47, 76]. Another factor, compatibility, also has a positive and significant impact on SM adoption (Table 5; p = 0.044), so the null hypothesis H_2 is accepted. The result is similar to the earlier outcome [13, 22, 50, 70].

Another technological factor, complexity, has an insignificant impact on SM adoption (Table 5: P=0.929), the null hypothesis H_3 is rejected. The result indicates that complexity shows insignificant impact in adoption of SM. This result is similar to the earlier researcher [18, 21, 76].

In this study, TMS (organizational top management) support for SM adoption has a positive and significant effect (Table 5; p = 0.016), so the null hypothesis H_4 is accepted. The result is similar to the previous result [51, 56, 70]. The result of an important organizational factor, cost effectiveness, indicates that the limited cost of SM adoption yields significant positive benefits for enduring numerous promotion and operations-related activities compared to traditional marketing in the performance of SME. The result shows similarity to previous studies [14, 38, 47, 76]. Another organizational factor, perceived employee capability for SM adoption has a negative and insignificant relationship for SM adoption (Table 5; p = 0.290), so the null hypothesis H_7 is rejected. The outcome reveals that employees' ability to adopt SM does not affect SM adoption.

In this study, competitors' pressure, factors for SM adoption, have a negative and insignificant relationship with SM adoption (Table 5; p = 0.108), so the null hypothesis H_7 is rejected.

Another factor, perceived usefulness, has a positive and significant impact on the adoption of SM (Table 5; p = 0.042), so the null hypothesis H_8 is accepted. This result indicates that the perceived usefulness of SM helps promote the latest product and to invite new customers. The result shows similarity with previous studies [47, 65, 66, 76]. On the subject of perceived ease of use has a positive and significant relationship with social media adoption (Table 5; p = 0.013), so the null hypothesis H_9 is accepted. The outcome reveals that perceived ease of use for the adoption of SM does effect on SME performance. This result is alike with the previous research studies [22, 50, 56].

In this study, SM adoption has a positive and significant relationship in SME's sustainability (Table 5; p = 0.000), so the null hypothesis H_{10} is accepted. The outcome reveals that SME firms adopt SM for sustainable economic development, which is a good sign for internationalization, avoiding the fear of potential customers and SMEs' performance. This result is similar to previous research studies [6, 8, 15].

7. Conclusion

This study extends the TOE framework and TAM model elements by assessing the different factors that impact the SM adoption and sustainability of SMEs in the Bangladeshi context. Most research have used the TOE model engaging technological factors such as relative advantage, complexity, compatibility [6, 13, 15, 47, 56, 66, 71].

This research displays an exhaustive view of the SM adoption factors that support in decision-making to conform the significance of SM adoption from the viewpoint of SME. This research reveals the essential and influencing factors of SM adoption that enhance the sustainability of the SME sector of Bangladesh. The results of this study reveal that some influencing factors of SM adoption have a positive and significant impact on performance related to maintaining relationships with customers, reducing costs in promotional events, and amplifying consumer loyalty.

Furthermore, relative advantage and compatibility are supportive to adopt SM, and SM helps in decision making that is very important for the sustainability of SME firms. From an organizational factor, top management support and cost-effectiveness are also helpful in SME performance and sustainability issues. Perceived usefulness and perceived ease of use have a positive and significant impact on the sustainability of SME firms.

8. Limitations and Future Research

This research identifies the different factors that impact significantly in adoption of social media and SM has significant influence in sustainability of SMEs. Other important factors, such as Government support, information accessibility, visibility, bandwagon effect, customers' pressure, and resource shortage that were not measured in the list of influencing factors. This can be deemed as a limitation of the study. The present study examined various factors influencing social media adoption and its influence on SME performance. This model was used in developing countries like Bangladesh, but has not been used in a comparative study that is necessary to validate the outcomes of the research.

Additionally, this study considered only the financial performance of SME, but non-financial performance was not considered here. This research has been done on the SME firms in Bangladesh, but the researcher can perform on different sectors such as service sector, trade sector or manufacturing sector separately. The sample size of the study can be considered a limitation. The specific technique of reaching the respondents may be measured as a limitation.

Future studies can be done on the influence of social media on non-financial performance. In addition to the manufacturing sector, the service sector, micro enterprise, and cottage enterprise can be included in the upcoming research. Future studies can also be done on the influencing factors on the non-adoption of social media.

Abbreviations

SMEs	Small and medium-sized enterprises
TAM	Technology Acceptance Model
TOE	Technology-Organization-Environment
SM	Social Media
KMO	Kaiser-Meyer-Olkin
CMB	Common Method Bias
VIF	Variance Inflation Factor
HTMT	Heterotrait-Monotrait ratio

Author Contributions

Raj Kumar Moulick: Conceptualization, Resources, & Writing – original draft

Md. Sumon Hossain: Data curation, Methodology, & Review final draft

Mst. Hasna Banu: Formal Analysis, Investigation, Validation

Shamalia Binte Haque: Funding acquisition, Methodology

Conflicts of Interest

The authors declare no conflicts of interest.

Appendix

Questionnaire

Questionnaire for the Respondent

Department of Accounting and Information Systems

University of Rajshahi

Dear Sir/Madam,

I am conducting a research study under the Department of Accounting and information Systems, University of Rajshahi. The title of my research study is "*The impact of social media engagement on the sustainability of Bangladeshi SMEs from the perceptions of top managers and owners: A TOE framework and TAM model analysis".* You are requested to indicate your opinion by putting *tick mark (√)* against each question in the box at the right side of the question. Your opinion has great value to us and will be kept confidential.

In the likert type question, various statements are weighted as follows:

Table A1. *Likert Scale weight*

5	4	3	2	1
I strongly agree	I agree	Neutral	I do not agree	strongly disagree

Section A: Profile of the Respondent

1) Name of the Respondent:

2) Name of the Organization:

3) Designation of the Respondent:

4) Small or medium enterprise:

1) Employee 31-120 (assets 7.5 m - 150m)

2) Employee 121-300 (assets 150 m -500m)

SM platform used 1. Facebook □ 2. Twitter □ 3. LinkedIn □ 4. WhatsApp □ 5. YouTube □

Section B: Evaluation of the different Influencing factors of SM adoption.

Please state your opinion regarding the different influencing factors of SM adoption

Table A2. *Items of the variables of the study*

			5	4	3	2	1
Technological Relative	RA1	Social media marketing would enable our enterprise to market our products/ services in a better way.					

			5	4	3	2	1
Advantage	RA2	SM allows us to accomplish specific tasks more quickly.					
	RA3	Social media marketing would enable our enterprise to communicate with our customers effectively.					
	RA4	SM offers interactive mechanisms for value co-creation with our audience.					
	RA5	Social media marketing would assist us in developing better relationships with our customers.					
Compatibility	COM1	SM adoption is compatible with the company's IT infrastructure.					
	COM2	SM adoption is compatible with our business processes and operations.					
	COM3	SM adoption is consistent with the company's beliefs and values.					
	COM4	Search for general information related to customer and competitors.					
Complexity	CP1	The use of social media marketing would require a lot of mental effort.					
	CP2	The use of social media marketing would be frustrating.					
	CP3	Social media marketing would be too complex for our marketing activities.					
	CP4	The skills needed to use social media marketing would be too complex for employees of our enterprise					
Organizational Top management support	TMS1	Social media adoption enables us to advertise, promote and deliver products/ services to the customer.					
	TMS2	Our marketing budgets would be significant enough financial resources to support the adoption of social media marketing.					
	TMS3	Top management emphasis on R&D, technological leadership.					
	TMS4	Top management emphasis on innovations					
Cost effectiveness	CE1	The cost involved in providing support systems for social media marketing would be too high					
	CE2	SM platform saves costs relating to time and effort in marketing, branding and customer service.					
	CE3	The basic training for employees to use social media marketing would be very low					
	CE4	Both way communication is possible with low cost.					
Perceived Employee Capability (PEC)	PEC1	Our employees would be capable of learning new social media marketing related technology easily.					
	PEC2	Our employees would be capable of using social media marketing to interact with our customers.					
	PEC3	Our employees would be capable of providing new ideas on social media marketing use for our enterprise.					
	PEC4	Our employees would be capable of using social media marketing to solve our marketing problems easily.					
Environmental							
Competitive Pressure	COP1	It is easy for our customers to switch to another company for similar services/products without much difficulty.					
	COP2	There is rivalry among the firms in the industry; our firm is operating in an intense.					
	COP3	Customers are able to easily access to several available products which are different from ours but perform the same functions.					
	COP4	Our enterprise thinks that social media marketing has an influence on competition in their industry.					

			5	4	3	2	1
		Some of our competitors have already started using social media marketing.					
Perceived Customer Pressure	PCP1	Our customers would demand that we establish relationships with them using social media marketing					
	PCP2	Our relationship with our major customers would suffer if we did not adopt social media marketing.					
	PCP3	Customers want to get an instant response.					
	PCP4	Compared to other organizations, customers feel loyalty to be a stakeholder of social media-enabled firms					
TAM Model	PU1	SM helps in B2B Relationship Building					
Perceived Usefulness	PU2	Social media directly expands information accessibility by allowing real-time sharing					
	PU3	SM fixes one client while educating the wider user base.					
	PU4	Social media algorithms are built to prioritize engagement; content that gains initial traction is pushed to thousands of other users, creating a powerful loop of psychological pressure to conform					
Perceived Ease of Use	PEU1	Users like, share, or buy things purely because they see millions of others doing it.					
	PEU2	High usability lowers the mental barrier to participation.					
	PEU3	SM allows us to maintain customer relations in real-time sharing.					
	PEU4	Platform like WhatsApp or Instagram is simple and intuitive to navigate, users view it as more useful for accomplishing daily tasks.					
Social Media Adoption	SMA1	SM allow us to create brand visibility.					
	SMA2	SM allows us to promote our newest products					
	SMA3	Social sustainability improved overall stakeholder welfare.					
	SMA4	SM allows us to increase the visibility of the company.					
	SMA5	SM allows us to maintain customer relations in real-time sharing.					
SMEs' Sustainability	SMEP1	SM provides a cost-effective way to market products, expand customer bases and boost performance.					
	SMEP2	SMEs use SM channels to announce their eco-friendly practices, directly shaping a positive green organizational identity.					
	SMEP3	SM allows real-time communication with customers and suppliers, fostering faithfulness and cooperative problem-solving					
	SMEP4	Digital integration helps firms sustain visibility and adapt during market disruptions					
	SMEP5	SM acts as a vital engine for SMEs to drive economic, social, and environmental sustainability.					

Signature of the respondent

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