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A Structural Path Analysis Bangladeshi SMEs' Sustainability through Social Media Marketing

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Abstract: Businesses use technological and social media marketing to respond to the COVID-19 pandemic. The study aims to better understand the factors that impact the spread of new technologies, the effectiveness of social media advertising, and the longevity of businesses. The researcher used a quantitative strategy based on partial least squares structural equation modeling to learn about the phenomenon of interest as much as possible. Dhaka, Bangladesh, small and medium enterprises (SMEs) participated in the survey. According to the findings, the popularity of internet and e-business technologies may be attributed to their apparent usefulness and practical experience ease of use. It is connecting internet/e-business technology, social media marketing, and the long-term success of small and medium enterprises (SMEs). Still, the expense factor was insufficient to prove that SMEs engage in social media advertising. The mediating effects between components may be better understood via internet/e-business technology and social media interactions, as shown in the study. This study is the first of its kind in Bangladesh and sheds light on the resilience of SMEs in the face of the COVID-19 pandemic, notwithstanding its focus on the capital city of Dhaka.

Keywords: SMEs; social media marketing; sustainability; e-business technology

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1. Introduction

Many of the world's top firms depend substantially on small- and medium-sized enterprises (SMEs) for crucial resources. Their success substantially impacts the economies of countries where SMEs grow [1–3]. Historically, SMEs have focused on established markets, although this tendency has started to alter in recent years [4,5]. Despite their multiple benefits, small- and medium-sized enterprises (SMEs) around the globe, and especially those operating (or wishing to operate) in developing nations [6], often face resource constraints and a dearth of technology applications.

Despite the rising significance of globalization, the success of small- and medium-sized businesses (SMEs) is dependent on cutting-edge technology [7–9]. Small- and medium-sized firms' long-term expansion and success may be facilitated by using improved, widely known, cost-effective marketing strategies [10,11]. Information and communication technology (ICT) should be viewed as an essential and potentially fruitful tool for promoting products and services and fostering further sustainable business growth by small- and medium-sized enterprises (SMEs), given the need to integrate new technologies into established processes [12]. Small- and medium-sized enterprises (SMEs) must rely heavily on social media to engage with their clients. Therefore, it may pertain to anything associated

with "a new generation of web development and design that aims to improve communication, sourcing, information sharing, interoperability, and collaboration on the World Wide Web". SMM adoption is more probable among SMEs if proponents see the technology as beneficial and secure [13–15]. Before committing to SMM, small- and medium-sized businesses (SMEs) must assess the advantages and downsides of the approach carefully. Theoretically, these concerns are supported by the technology acceptance model (TAM), but how TAM presents itself in the context of small- and medium-sized businesses (SMEs) in developing countries that employ social media marketing (SMM) has received little research [16–19].

There is some evidence that SMM may assist SMEs in adopting new technologies; however, the vast majority of research in this area is conducted from the perspective of Western economies and their particular needs, goals, and viewpoints [20]. For developing nations such as Bangladesh, small- and medium-sized enterprises (SMEs) are essential to economic progress [3,21]. Despite this, many lack the technical know-how and suffer financially [22]. Despite this, there is universal consensus that the practicality of ICT is crucial to their continued success in this field [23,24]. For small- and medium-sized companies (SMEs) in developing countries to grow sustainably, social media marketing (SMM) is an effective strategy [25,26]. A combination of circumstances led to this result. Access to timely, relevant information via social media platforms and apps may stimulate customer engagement with companies and their products and services [27]. Even though small- and medium-sized businesses (SMEs) can achieve sustainable business growth through the effective and efficient use of SMMs, few studies discuss how SMEs in emerging economies achieve positive outcomes through the use of SMM applications and how highlighted mechanisms, such as appropriate leadership support, can assist them in obtaining additional benefits from SMM applications.

This investigation seeks to understand the elements that influence the broad adoption of social media marketing methods. This study is essential because it gives insight into how ICT may help the long-term development of Bangladesh's SME sector. In addition, we offered a complete assessment of the elements that may impact the long-term survival of SMEs and the growth-promoting measures. We recognize that there are still significant gaps in the study on the degree to which e-commerce is embraced in developing nations [28]. Several significant factors influence them in Bangladesh, including the availability of educational opportunities, public awareness, the availability of information, and maybe the sophistication of the country's e-commerce infrastructure [28].

Research Objective

The aim of this study is to identify the following relationships:

(a) To identify the influences of perceived usefulness, perceived ease of use, the adoption of e-business technologies, and social media marketing on SMEs' sustainability.
(b) To what extent the adoption of e-business mediates the relationship of perceived usefulness and perceived ease of use technologies on SMEs' sustainability.
(c) To what extent social media marketing mediates the relationship of perceived usefulness and perceived ease of use technologies on SMEs' sustainability.

2. Literature Review

2.1. Theoretical Underpinning

The technology acceptance model (TAM), developed by Davis [18], is selected as the foundational theoretical framework for this study on the adoption of social media marketing (SMM) by small- and medium-sized enterprises (SMEs) in developing countries. TAM is preferred for its specific focus on the fundamental aspects of technology acceptance: perceived usefulness (PU) and perceived ease of use (PEOU) [29]. These constructs are particularly relevant in assessing the adoption of digital marketing tools like SMM [30], as they directly address the practical and operational concerns that SMEs face when integrating new technologies into their business processes.

Studies have repeatedly affirmed that TAM effectively predicts technology acceptance and usage, providing clear insights into how users' perceptions shape their engagement with technology [31–35]. This focus is crucial in the context of SMEs in developing countries where resource constraints necessitate technologies that are both effective in enhancing business performance and straightforward to implement.

While other models like the Technology–Organization–Environment (TOE) framework or the Human, Organization, and Technology-fit (HOT-Fit) model offer broader analyses of organizational and environmental factors influencing technology adoption [36], they may not provide the same level of specificity regarding individual user perceptions as TAM [37]. The TOE framework, for instance, considers technological, organizational, and environmental influences as separate but overlapping spheres that affect technology adoption decisions at an organizational level [37,38]. Although comprehensive, TOE's broad focus might dilute the specific user-centric insights that are critical in understanding why individual SMEs in resource-limited settings decide to adopt or reject SMM [39]. Similarly, the HOT-Fit model, which integrates human, organizational, and technology factors to explain system effectiveness, is more suited to evaluating the overall fit and performance of technology systems within organizations rather than the initial acceptance and use from a user perspective [40].

By focusing on TAM, this study directly taps into the cognitive processes of SME owners and managers as they evaluate the utility and usability of SMM. This focus is crucial in environments where businesses may be more hesitant to adopt new technologies due to fears of high complexity or low return on investment. Furthermore, the effectiveness of SMM in mediating the relationship between PU, PEOU, and actual usage offers practical implications for enhancing business strategies through targeted social media initiatives [40–42]. Thus, while TOE and HOT-Fit provide valuable frameworks for understanding the broader organizational and technological contexts, TAM is chosen for its precise alignment with the study's aims to elucidate the individual-level decision-making processes that underpin SMM adoption in SMEs within developing countries. This tailored approach (refer to Figure 1) ensures that the research outcomes will directly inform practical strategies to leverage SMM for business growth and sustainability in these regions.

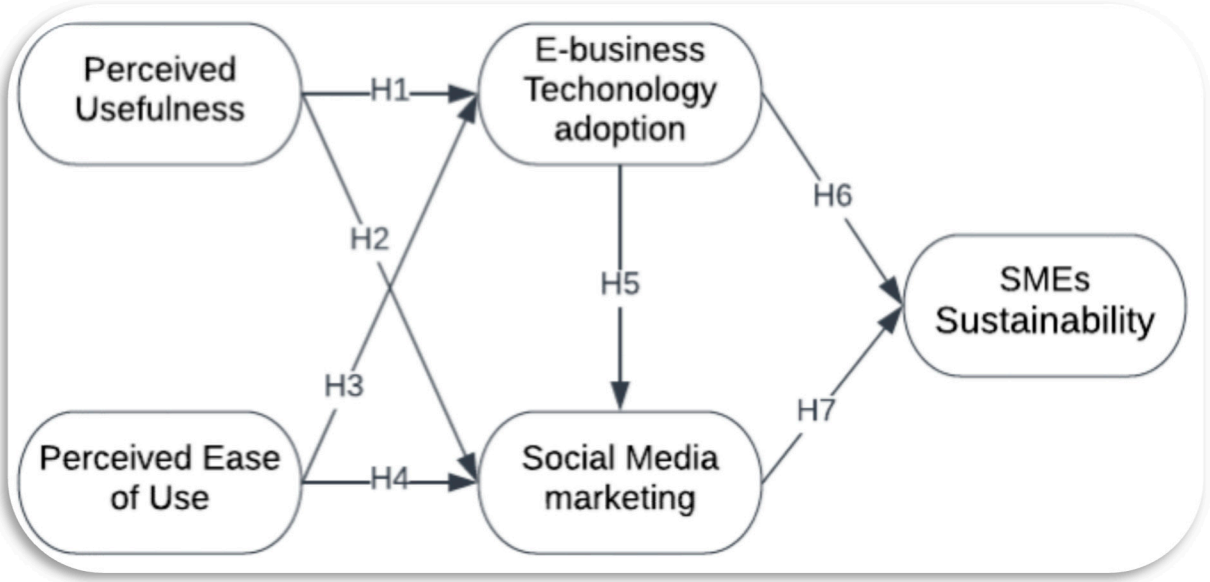

Figure 1. Research model.

2.2. Hypothesis Development

2.2.1. Perceived Usefulness

Davis [18] created the Technology Adoption Model (TAM) to forecast how rapidly people will adopt new types of technology (PEU). If properly adopted and executed, a quality management system can benefit SMEs in achieving PEU criteria [18,43]. Small- and medium-sized businesses (SMEs) would likely adopt SMM if they knew its potential financial benefits. According to studies by Chatterjee and Kumar [42] and Qalati et al. [44], SMEs may increase their production using SMM. Numerous studies have shown a link between PEU and customers' enthusiasm to test cutting-edge technology [44]. A recent study demonstrates that the rising usage of smartphones by the PEU is closely proportional to their greater engagement in social networking sites. The following are some of the proposed hypotheses:

H1: *There is a positive relationship between perceived usefulness and e-business technology.*

H2: *There is a positive relationship between perceived usefulness and social media marketing.*

2.2.2. Perceived Ease of Use

The Davis [18] notion of perceived ease of use (PEOU) has been extensively used to examine the proliferation of new technologies in business and other settings. Multiple studies indicate that the adoption of internet and e-business technologies is impacted by their perceived simplicity of use [45,46]. This is because novices are hesitant to use cutting-edge technologies due to their perceived complexity, even though they stand to benefit much from doing so. When it comes to expanding their businesses, entrepreneurs are more open to adopting cutting-edge technology if it is easy to use [22,47]. Businesses may boost their productivity and revenue by maximizing their use of social media tools.

Consequently, many SMEs are incorporating social media into their strategic planning. As a result of this improvement in usability, there will be a larger adoption of cutting-edge technology. PEOU's future performance is influenced by its cutting-edge technologies [48,49]. According to the findings of Chatterjee and Kumar [42] and Kraus et al.'s [50] respective studies, for this debate, the following hypotheses will be accepted:

H3: *There is a positive relationship between perceived ease of use and e-business technology.*

H4: *There is a positive relationship between perceived ease of use and social media marketing.*

2.2.3. The Adoption of E-Business Technologies

The rate at which SMEs embrace new ideas is influenced by various variables, including organizational structure, environment, and accessible technology [42]. The notion of technology–organization–environment (TOE) blending offers an integrative framework for coupling technical elements, contextual organizational characteristics, and broad environmental concerns. Innovation amplifies the benefits of existing processes and technologies, and SMEs are aware of this [51]. As a result, it is projected that e-commerce and internet technologies would stimulate increasing output. Adopting EBT (business technologies) may influence profitability immediately and in the long term due to its capacity to maximize resource use. Earlier studies by scholars such as Ifinedo [52] demonstrate that a similar benefit is a significant predictor of EBTA (adopting e-business technologies) and associated technologies among SMEs. Specifically, our perspective on adopting EBTA by SMEs is modified [53].

H5: *There is a positive relationship between adopting e-business technologies and social media marketing.*

H6: *There is a positive relationship between adopting e-business technologies and SMEs' sustainability.*

2.2.4. Social Media Marketing and SMEs' Sustainability

Social presence theory refers to research that studies the consequences of a single social encounter on future encounters [54]. Social media marketing (SMM) is the relatively new activity of advertising one's company, causes, or ideas using social networking sites and other online communities [55,56]. Consumers and group members use a smartphone and web-based technology on online marketing platforms to share, co-create, discuss, and alter content, promoting the dissemination of information and developing interpersonal ties among the persons involved [57,58]. User-generated material has helped increase the popularity of brand posts [59,60], attract new customers, increase brand exposure and revenue, build customer loyalty, and even predict users' future purchase behaviors. Despite constituting the vast majority of businesses globally, it is believed that SMEs are accountable for more than 70 percent of all global pollution [61,62].

Due to the emphasis on big, multinational businesses, the sustainability detour made by small- and medium-sized enterprises (SMEs) is not often acknowledged or documented in the literature on sustainable development and corporate innovation [58]. Compared to major organizations, small- and medium-sized businesses (SMEs) have a lower green incentive endowment [63], which causes problems in the form of financial limits, personnel and resource management issues, and other obstacles. According to preliminary research conducted by Barbosa et al. [48], small businesses struggle with conceptual knowledge and equipment to measure and organize environmental outcomes due to the misconception that sustainability increases costs. However, sustainable practices may improve ecosystem health, community vitality, and economic prosperity [64].

Implementing sustainable strategies may be beneficial for businesses and other groups [65]. The researchers in the study of Raut et al. [66] also found that adopting SOM boosted business performance and decreased the company's negative consequences on society and the environment [67,68]. According to Gotschol et al. [69], a strong relationship exists between a corporation's internal corporate activities and its long-term economic, environmental, and social performance and benefits [70–72]. Companies would do well to see the green challenge as a competitive advantage in today's market, as environmentally conscious customers increasingly choose eco-friendly goods. It is conceivable for a company's community standing to improve due to its efforts to promote social responsibility. Therefore, it is reasonable to assume that the SOM approach enhances longevity, a characteristic essential to the success of business operations.

H7: *There is a positive relationship between social media marketing and SMEs' sustainability.*

3. Research Methodology

To explore the role of e-business technology (EBT) and social media marketing (SMM) as mediators between perceived utility and ease of use, and SME sustainability, we adopted a quantitative approach using partial least squares structural equation modeling (PLS-SEM). According to Hair et al. [73], this method is particularly suitable for its robustness in handling complex models and effectiveness with the small to moderate sample sizes typical in SME research settings.

Our study focused on small- and medium-sized enterprise owners and managers in Dhaka, Bangladesh, a city characterized by a dynamic economic environment and a high concentration of SMEs actively engaging in digital transformations, making it an ideal setting for this investigation [74]. We employed non-probability purposive sampling to target respondents directly involved in or knowledgeable about their organization's marketing and technology adoption strategies. The sample size of 363 respondents from 195 organizations ensures sufficient statistical power to validate our research hypotheses and provide a robust and representative analysis of technology adoption patterns across diverse SMEs in Bangladesh.

However, this approach may introduce a success bias, as it could overrepresent more technologically adept enterprises [75]. But the analysis shows the responders are from diverted organizations with different levels of expertise and exposure to technology and social media. Data collection was conducted using a structured questionnaire distributed via Google Forms and disseminated through WhatsApp, a method selected for its widespread use and accessibility among our target demographic in Bangladesh [76]. The questionnaire comprised 25 items developed from established scales and adapted to the local business context. The respondents rated their agreement on a five-point Likert scale, a method widely recognized for effectively capturing degrees of perception and experience related to technology adoption.

Ethical considerations were rigorously adhered to, ensuring the anonymity and confidentiality of all participants. Data analysis was performed using SmartPLS 4.0, which facilitated a detailed examination of both measurement and structural models, providing insights into the intricate relationships among constructs of perceived usefulness, ease of use, and the adoption and impacts of EBT and SMM on SME sustainability [77].

This methodological approach not only allows for a comprehensive analysis of how SMEs in developing countries perceive and utilize digital technologies but also addresses the potential biases and ethical considerations inherent in research involving SMEs and technology adoption.

4. Data Analysis

The demographic data from the study on the adoption of e-business technologies and social media marketing (SMM) among SMEs in Bangladesh reveal a diverse participant profile, primarily consisting of younger (refer to Table 1), tech-savvy individuals, with 30.3% aged between 25 and 34 and 26.2% between 35 and 44. This youthful demographic likely influences the high rate of technology adoption observed in the study, as younger individuals are generally more open to adopting new technologies. The gender distribution shows a majority of male respondents (59.2%), reflecting common business ownership trends in the region where males predominantly engage more in the business and technology sectors.

Educationally, the respondents are well qualified, with a significant 41.3% holding Bachelor's degrees and 11.9% having Master's degrees or higher, indicating a group that understands and values the potential benefits of digital tools. The variety of positions within companies, notably with 24.8% being owners and 34.4% managers, suggests that the survey captured insights from decision-makers who can directly influence the integration of new technologies within their enterprises.

The survey also encompassed a wide range of industries, with the textiles and garments sector, a key industry in Bangladesh, representing 22.0% of the sample. This diversity allows for a richer analysis of how different sectors are adopting technology. The majority of businesses have been operating for 1–5 years (45.5%), indicating a sample of relatively newer enterprises that might be more adaptable and open to technological integration as they are still shaping their operational and strategic foundations.

In terms of technology adoption, both e-business technologies and SMM show high integration rates, with 36.6% fully integrating e-business tools and 35.3% fully incorporating SMM into their operations. These high rates underscore the critical role of digital tools in enhancing business operations and marketing efficacy in today's digital economy.

The findings from these demographic and technology adoption data are crucial as they highlight the active engagement of SMEs in Bangladesh with digital technologies, reflecting a forward-looking approach to business management and growth. The insights derived can help in crafting educational and development programs tailored to support further adoption, particularly focusing on sectors or demographics showing lower engagement. Additionally, these insights can inform policymakers and business leaders in creating supportive environments that foster SME growth through enhanced digital capabilities.

Table 1. Demographics profiles of the respondents.

Variable	Category	Number of Responses	Percentage (%)
Age of Respondents	Under 25	45	12.4
	25–34	110	30.3
	35–44	95	26.2
	45–54	70	19.3
	55–64	35	9.6
	65 and above	8	2.2
Gender	Male	215	59.2
	Female	148	40.8
Educational Background	Below SSC	20	5.5
	SSC	65	17.9
	HSC	85	23.4
	Bachelor's degree	150	41.3
	Master's degree or higher	43	11.9
Position within the Company	Owner	90	24.8
	Manager	125	34.4
	Marketing/Sales	75	20.7
	IT Support	40	11.0
	Other	33	9.1
Industry Type	Manufacturing	40	11.0
	Services	75	20.7
	Retail	50	13.8
	IT and Technology	55	15.2
	Textiles and Garments	80	22.0
	Food and Beverage	30	8.3
	Healthcare	15	4.1
	Education	10	2.8
	Other	8	2.2
Years in Operation	Less than 1 year	18	5.0
	1–5 years	165	45.5
	6–10 years	95	26.2
	11–20 years	65	17.9
	More than 20 years	20	5.5
Use of E-Business Technologies	Not using	30	8.3
	Planning to use	70	19.3
	Currently implementing	130	35.8
	Fully integrated	133	36.6
Use of Social Media Marketing	Not using	40	11.0
	Planning to use	80	22.0
	Currently implementing	115	31.7
	Fully integrated	128	35.3

4.1. Measurement Model Statistics

The unwavering quality investigation evaluates the questionnaire's content for internal consistency (Figure 2). Cronbach's Alpha values over 0.5 are dependable [56]. Calculating Cronbach's Alpha (refer to Table 2) boosts the dependability of the development estimation factors. If, however, Cronbach's Alpha is less than 0.50, the variables are deemed unreliable.

Indicator reliability is synonymous with the outside loading dimension. We estimated loadings, cross-loadings, composite reliability, and AVE for the indicators using the Smart-PLS 3.0 default PLS approach. According to a conventional procedure, each item's loading must exceed 0.70 [78].

A scale's dependability may be determined by its internal consistency, which is "the degree to which all items on a single subscale evaluate the same concept".

Cronbach's Alpha is often used to determine the dependability of internal consistency [79,80]. This section's estimate method uses indicators of manifest variable intercorrelations; all indicators have identical outer loadings.

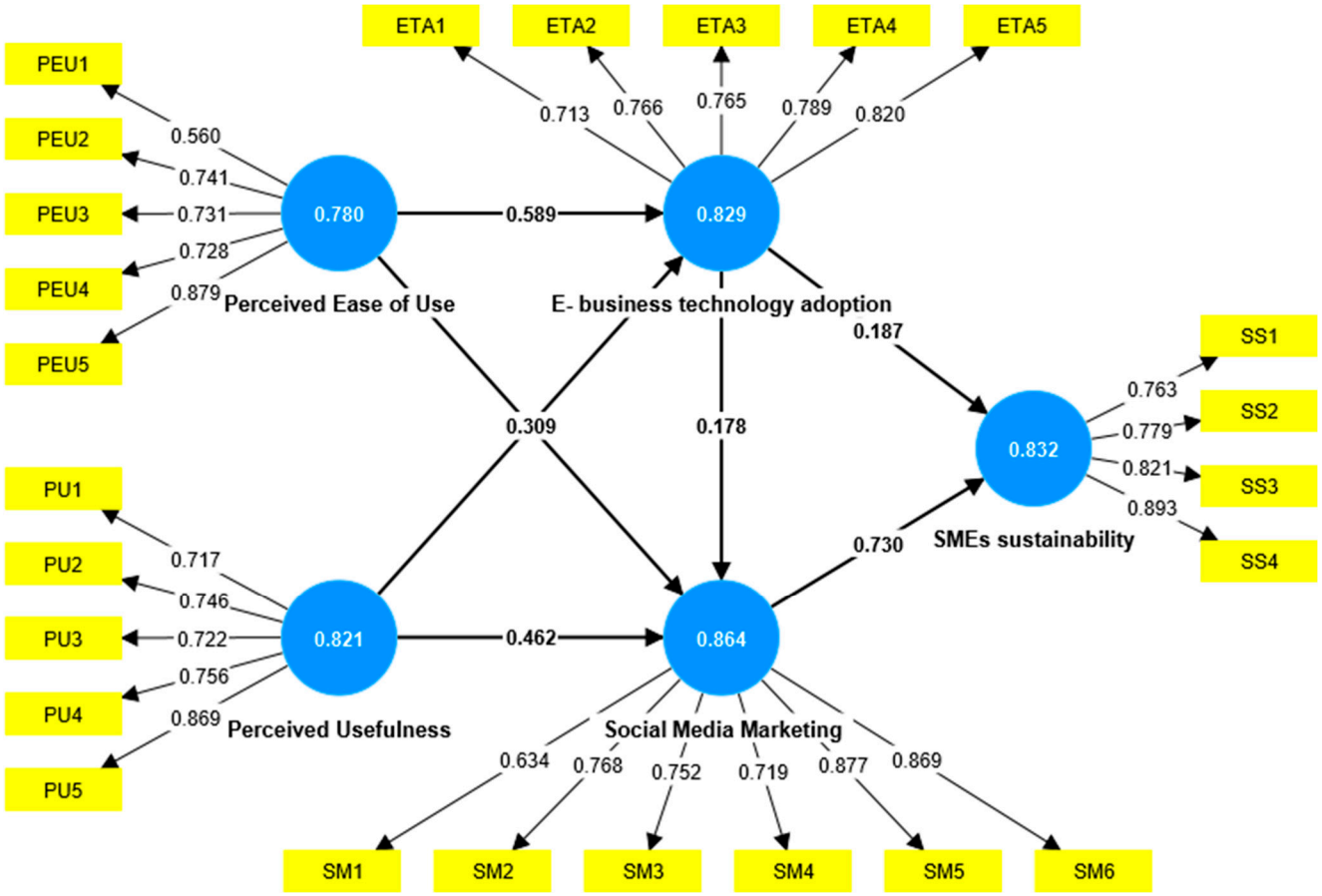

Figure 2. Measurement model illustration.

Table 2. Measurement model statistics.

Construct	Item	Measurement Item	Source	VIF	CA	CR	AVE
E-business Technology Adoption	ETA1	We frequently use e-business technologies for managing day-to-day operations.	[81]	1.493	0.829	0.830	0.595
	ETA2	Our firm uses e-business technologies for customer relationship management.	[42]	1.679			
	ETA3	E-business technologies are integrated into our marketing activities.	[82]	1.640			
	ETA4	Our firm relies on e-business technologies for logistics and supply chain management.	[83]	1.752			
	ETA5	We use e-business technologies to facilitate transactions with suppliers and partners.	[84]	1.933			
Perceived Ease of Use	PEU1	Learning to operate e-business technologies would be easy for me.	[18]	1.223	0.780	0.808	0.540
	PEU2	I would find it easy to get e-business technologies to do what I want them to do.	[85]	1.533			
	PEU3	Interacting with e-business technologies would require the least mental effort.	[18]	1.494			
	PEU4	I find e-business technologies to be flexible to interact with.	[86]	1.568			
	PEU5	It would be easy for me to become skillful at using e-business technologies.	[18]	2.268			

Table 2. *Cont.*

Construct	Item	Measurement Item	Source	VIF	CA	CR	AVE
Perceived Usefulness	PU1	Using e-business technologies improves the efficiency of our business operations.	[18]	1.499	0.821	0.836	0.584
	PU2	Using e-business technologies enhances our effectiveness in the market.	[43]	1.607			
	PU3	I find e-business technologies useful in helping us reach business goals.	[85]	1.493			
	PU4	E-business technologies reduce the cost of doing business.	[39]	1.648			
	PU5	Using e-business technologies improves the quality of services we provide to customers.	[74]	2.258			
SME Sustainability	SM1	Our business practices are environmentally friendly.	[87]	1.380	0.832	0.845	0.666
	SM2	Our firm actively participates in community social responsibility activities.	[88]	1.825			
	SM3	We regularly invest in employee training and development for sustainable growth.	[89]	1.700			
	SM4	Our business decisions consider long-term economic, social, and environmental impacts.	[82]	1.649			
	SM5	We implement measures to minimize waste and utilize resources efficiently.	[90]	3.107			
	SM6	Our business maintains strong ethical practices in all operations.	[90]	2.987			
Social Media Marketing	SS1	We use social media platforms to engage with and respond to customers.	[91]	1.581	0.864	0.882	0.600
	SS2	We use social media to promote our products and services.	[92]	1.660			
	SS3	We measure the effectiveness of our social media campaigns.	[93]	1.962			
	SS4	Social media platforms are a critical tool for our marketing strategy.	[94]	2.483			

The Variance Inflation Factor-based collinearity test determines the degree of correlation between a given collection of variables (VIF). Therefore, these criteria may assess whether the VIF is collinear with the dependent variable [95]. The broad range of VIF coefficient values (1.138 to 3.664, or 5.00) indicates no collinearity among the construct variables, indicating that the assessment is legitimate.

4.2. Structural Model Statistics

We used structural equation modeling (refer to Figure 3) to examine the underlying assumptions of the model. Table 3 illustrates the structural model statistics, revealing significant relationships among key variables in the study. E-business technology adoption positively influences SME sustainability with a coefficient of 0.317 and high statistical significance (T = 3.710, p = 0.000). This adoption also impacts social media marketing with a coefficient of 0.178, showing significance (T = 2.393, p = 0.017).

Table 3. Structural model statistics.

Path	Original Sample	Sample Mean	Standard Deviation	T Statistics	p Values
E-business technology adoption - SMEs' sustainability	0.317	0.315	0.085	3.710	0.000
E-business technology adoption - Social Media Marketing	0.178	0.180	0.074	2.393	0.017
Perceived Ease of Use - E-business technology adoption	0.589	0.586	0.084	7.045	0.000
Perceived Ease of Use - Social Media Marketing	0.440	0.444	0.058	7.578	0.000
Perceived Usefulness - E-business technology adoption	0.309	0.312	0.084	3.694	0.000
Perceived Usefulness - Social Media Marketing	0.517	0.514	0.055	9.344	0.000
Social Media Marketing - SMEs' sustainability	0.730	0.737	0.084	8.727	0.000

Perceived ease of use strongly affects e-business technology adoption (coefficient = 0.589, T = 7.045, p = 0.000) and social media marketing (coefficient = 0.440, T = 7.578, p = 0.000). Similarly, perceived usefulness significantly drives e-business technology adoption (coeffi-

cient = 0.309, T = 3.694, p = 0.000) and social media marketing (coefficient = 0.517, T = 9.344, p = 0.000).

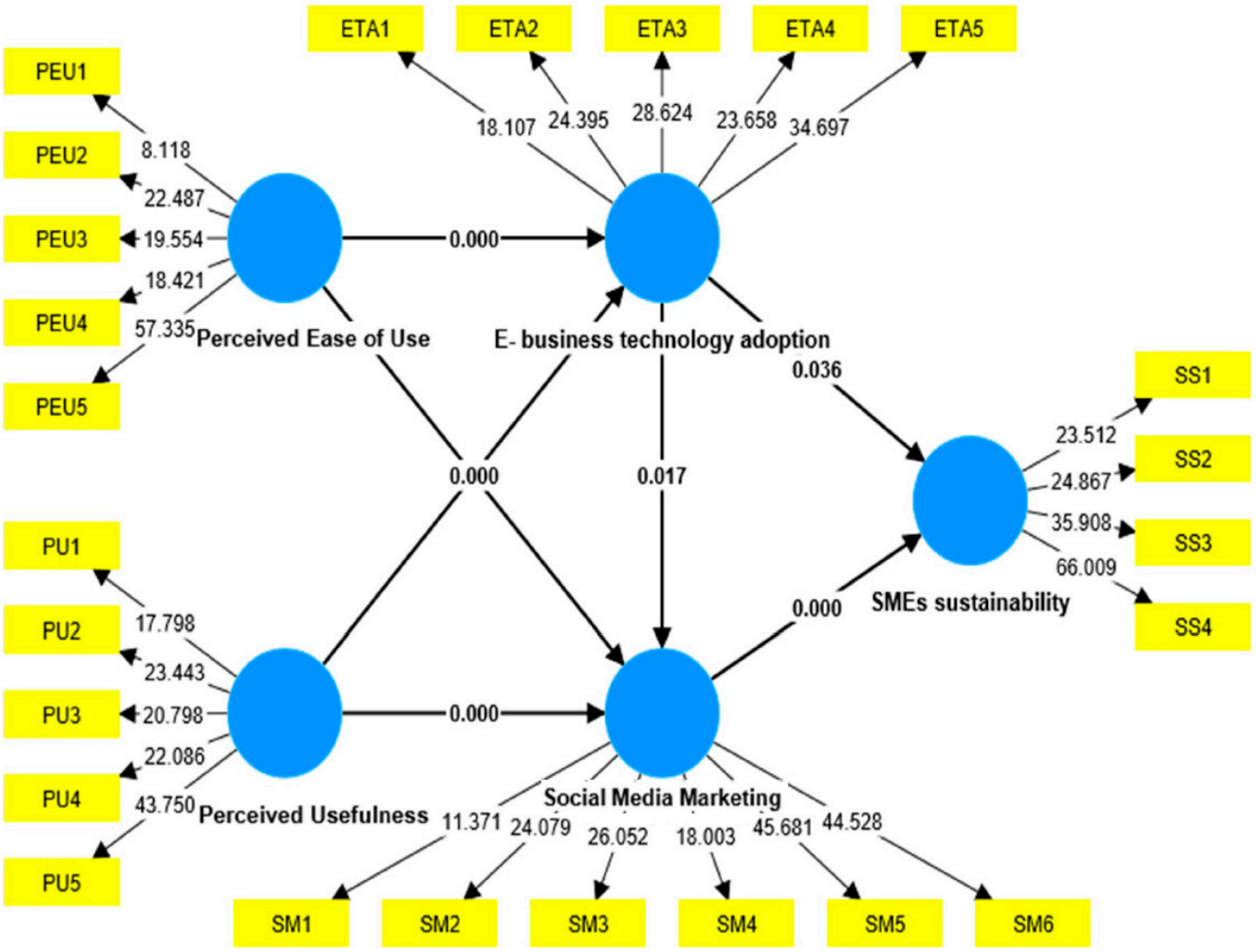

Figure 3. Structural model.

Lastly, social media marketing robustly enhances SME sustainability (coefficient = 0.730, T = 8.727, p = 0.000), demonstrating its pivotal role in the operational success of SMEs. These findings underscore the importance of usability and utility perceptions in adopting technologies that advance business sustainability.

Model Fit

The model fit statistics presented in Table 4 indicate the strong explanatory power of the independent variables on the dependent constructs within the study. For e-business technology adoption, the R-square value of 0.763 and an adjusted R-square of 0.761 suggest that the model explains approximately 76.3% of the variance, which is a robust level of predictive accuracy. Similarly, the R-square values for SME sustainability (0.801) and social media marketing (0.870) are even higher, indicating that 80.1% and 87.0% of the variance in these constructs can be explained by the independent variables identified in the model, respectively. These high R-square values demonstrate that the constructs of perceived utility, ease of use, and the roles of EBT and SMM are significant predictors of the technology adoption and sustainability outcomes among the SMEs in this study, affirming the model's strength and relevance in analyzing SME dynamics in the context of e-business and social media usage.

Table 4. Model fit statistics (r^2).

	R-Square	R-Square Adjusted
E-business technology adoption	0.763	0.761
SMEs' sustainability	0.801	0.799
Social Media Marketing	0.870	0.868

Similarly, the f^2 test was conducted to determine if the introduction of foreign structures substantially affected the operation of endogenous ones (refer to Table 5). The f^2 values of 0.02, 0.15, and 0.35 indicate that external constructions may have a minor, moderate, or significant impact on endogenous constructions, respectively [95]. Furthermore, PU and PEOU substantially impacted EBT (f^2 value was 0.978). In addition, PEU, PEOU, and EBT have all had substantial effects on SMM (f^2 value was 0.381). We conclude that the EBT and SMM sizes on SS are modest as this section concludes (f^2 value 0.321).

Table 5. Model fit (f^2).

	E-Business Technology Adoption	SMEs' Sustainability	Social Media Marketing
E-business technology adoption		0.049	0.058
Perceived Ease of Use	0.321		0.144
Perceived Usefulness	0.089		0.332
Social Media Marketing		0.744	

4.3. Discussion of the Findings

The findings validated each of the seven hypotheses that were explored. Initially, it was shown that the link between PU and EBT adoption had a *p*-value of 0.000, which is quite insignificant. Consequently, PU also has a very significant influence on SMM (p = 0.000). Many small- and medium-sized businesses (SMEs) see social media as an effective marketing tool. Utilizing social media properly may provide organizations various benefits, including increased productivity, enhanced question management, and delighted customers. Our results (refer to Table 6) concur with those of Elbanna et al. [96], Chatterjee and Kumar [42], and Chung et al. [47]. Online sales and payments have become the principal mode of EBT acceptance for several SMEs [96]. Internal networks have been well received by SMEs, particularly those who conduct mission-critical operations or other business activities needing a high EBT. The results of this research confirm those of Chong and Pervan [45] and Ifinedo [52], who discovered that SMM boosted SME product marketing and service delivery. SMEs may greatly benefit from SMM methods.

Table 6. Major findings of this study.

Hypothesis	T Statistics	*p* Values	Support
H1: There is a positive relationship between Perceived Usefulness and e-business technology.	3.694	0.000	Supported
H2: There is a positive relationship between Perceived Usefulness and social media marketing.	9.344	0.000	Supported
H3: There is a positive relationship between Perceived ease of use and e-business technology.	7.045	0.000	Supported
H4: There is a positive relationship between Perceived ease of use and social media marketing.	7.578	0.000	Supported
H5: There is a positive relationship between adopting e-business technologies and social media marketing.	2.393	0.017	Supported
H6: There is a positive relationship between adopting e-business technologies and SMEs' sustainability.	3.710	0.000	Supported
H7: There is a positive relationship between social media marketing and SMEs' sustainability.	8.727	0.000	Supported

According to the results, PEOU had a statistically significant effect on both the scatterplots of EBT and SMM ($p < 0.0001$ and $p < 0.001$, respectively), disproving the first and second hypotheses. The premise of SMM is that the instructional content and menu are simple to navigate. Small- and medium-sized enterprises (SMEs) that are active on social media have an advantage over their competitors regarding gaining new customers via this channel [97,98]. Using social media to promote a company sounds simple and may lead to access to important customer data [14,49,51]; Rana et al. [99]. The fifth hypothesis asserts a causal link between the widespread adoption of EBTs and SMM. The data estimate has a *p*-value of 0.017, which indicates that the adoption of EBTs is a significant factor in determining whether or not an organization utilizes SMM. Previous research by Chung et al. [47] and Zhang et al. [100] yielded similar findings.

The *p*-value of 0.000 suggests that IEBT's implementation impacts SMM. The implementation of EBT increased the long-term success of SMEs, according to this research. If SMEs include EBT in their SMM strategy, the outcomes of this research imply they stand to gain a great deal. SMEs have swiftly adopted the EBT for use in advertising, consumer spending, and other commercial endeavors [101,102]. They might employ EBT for a variety of treatments. This suggests that the initial research conducted by Chong and Pervan [45] and Ifinedo [52] should be safely rejected as flawed. In recent years, the use of social media marketing to enhance income by small- and medium-sized enterprises has gained appeal (SMM). Finally, the data revealed that SMM affects the long-term sustainability of SMEs. Increased social media usage has been associated with higher performance among SMEs, which might explain these results. Even when compared to other small- and medium-sized businesses whose advertising strategies do not include social media, the average daily sales volume is above average. Social media users are more likely to receive promotional communications and offer feedback on their purchases as personal remarks.

The faster examination of client needs has been made possible by quality management services. Due to SMM's constant desire for unique product marketing techniques, employees have grown more imaginative. Elbanna et al. [96] and Chatterjee and Kumar [42] both discovered comparable results.

5. Implications of This Study

5.1. Theoretical Implications

The study on the adoption of social media marketing (SMM) and e-business technologies by SMEs in Bangladesh, grounded in the technology acceptance model (TAM), offers several theoretical implications that expand the model's application and provide insights into technology adoption in developing countries. These findings validate TAM's relevance across diverse economic and cultural settings, demonstrating its robustness and generalizability [18], according to Venkatesh and Davis [85].

The integration of context-specific variables such as economic constraints, technological infrastructure readiness, and local market dynamics into the TAM framework provides a richer understanding of the barriers and facilitators to technology adoption. This adaptation suggests that external environmental factors significantly interact with perceived usefulness (PU) and perceived ease of use (PEOU) in shaping technology adoption behaviors, thereby enhancing the predictive power of TAM in scenarios where external factors play a crucial role [86].

Moreover, this study introduces the novel aspect of SMM and e-business technologies serving as mediators in the relationship between TAM constructs (PU and PEOU) and SME sustainability. The findings reveal that these technologies not only impact SME sustainability directly but also mediate the effects of perceived usefulness and ease of use on sustainable business outcomes. This mediation suggests a complex interaction where the effectiveness of technology implementation can enhance or constrain the impact of PU and PEOU on business sustainability.

In providing theoretical insights into how technology adoption influences SME sustainability, the research fills a significant gap in the TAM literature. By linking technology

adoption to sustainability outcomes, it contributes to a broader understanding of how digital tools support the long-term viability of SMEs, particularly in contexts characterized by rapid technological change and economic development challenges [44].

These findings encourage future modifications and extensions of TAM to better capture the strategic orientations and managerial perceptions towards technology in developing economies. The study underscores the importance of considering managerial strategies and orientations as potential moderators or additional constructs in TAM, reflecting the complex decision-making processes that influence technology adoption in SMEs [39,40].

This study not only reaffirms the validity of TAM in a new setting but also expands its theoretical scope by connecting it with practical aspects of technology implementation and its impact on business sustainability. These theoretical implications lay the groundwork for further research to explore how adaptations of technology acceptance models can incorporate broader economic, cultural, and strategic factors, enhancing the model's utility and applicability in global business research.

5.2. Practical Implications

The findings from this study on the adoption of social media marketing (SMM) and e-business technologies by SMEs in Bangladesh, underpinned by the technology acceptance model (TAM), provide actionable insights for practical application in developing countries. These insights guide SMEs to not only choose and integrate technologies that align with their operational needs and business goals but also to maximize their impact on customer engagement and business sustainability.

Strategically, SMEs should prioritize the adoption of technologies perceived as useful and easy to use. This involves evaluating new technologies for their direct benefits to business operations and ensuring they are user-friendly to encourage widespread adoption among staff. Training and continuous support are crucial as they enhance comfort with these technologies, facilitating smoother integration and better utilization within the company.

In terms of marketing, the effectiveness of SMM in expanding audience reach and enhancing customer interaction highlights the need for SMEs to actively engage on social media platforms. Utilizing the analytical tools provided by these platforms can help SMEs tailor their marketing strategies more effectively by understanding and responding to customer preferences and behaviors.

Moreover, investing in robust e-business solutions can streamline operations, enhance customer service, and open up new market opportunities. These technologies not only support efficient business operations but also contribute to long-term sustainability by enabling SMEs to manage resources more effectively and reach broader markets.

The mediation role of SMM and e-business technologies in enhancing business sustainability also suggests a focus on sustainable business practices. SMEs can use these digital platforms to promote environmentally friendly practices and products, which can improve their brand image and consumer trust.

Additionally, considering the challenges such as limited technical know-how and financial constraints faced by SMEs in developing countries, leveraging support from government and non-governmental organizations is crucial. Such support can come in the form of training, resources, and financial aid, which are essential in helping SMEs navigate the digital landscape effectively.

Finally, cultivating a digital culture within SMEs is essential for leveraging the full potential of new technologies. This means fostering an organizational mindset that embraces digital innovations and understands their value, driven by leadership that champions technological advancement. This cultural shift not only facilitates the integration of new technologies but also encourages innovative solutions to business challenges, enhancing overall competitiveness and sustainability.

In essence, the practical implications from this study encourage SMEs to adopt a strategic approach to technology integration, focusing on ease of use, utility, compre-

hensive marketing strategies through social media, sustainable business practices, and external support mechanisms, and fostering an organizational culture that embraces digital transformation.

6. Limitations and Future Research Directions

This study, focusing on the adoption of social media marketing (SMM) and e-business technologies by SMEs in Bangladesh through the lens of the technology acceptance model (TAM), presents several notable limitations that pave the way for future research directions.

One significant limitation is the reliance on self-reported data from SME owners and managers, which can introduce biases such as social desirability or response bias. Respondents might overstate their adoption and effectiveness of technology due to perceived expectations or underreport difficulties due to concerns about appearing less competent. This limitation suggests a need for future studies to incorporate more objective measures of technology adoption and business performance, possibly through case studies or third-party assessments.

The study's use of a non-probability purposive sampling method also limits the generalizability of the findings. Since the sample is drawn from a specific urban area (Dhaka) and may not adequately represent rural or less urbanized regions where technology adoption could be significantly different, future research should consider a broader, more diverse sampling strategy that includes these areas to enhance the applicability of the findings across different settings within the country.

Another limitation is the cross-sectional nature of the study, which captures a snapshot of attitudes and behaviors at a single point in time. This approach does not account for changes over time in technology adoption or the evolving impact of SMM and e-business technologies on SME sustainability. Longitudinal studies could provide deeper insights into the trajectories of technology adoption and its long-term effects on business outcomes.

Furthermore, the study focuses primarily on perceived usefulness and ease of use as determinants of technology adoption, potentially overlooking other relevant factors such as organizational culture, external pressures, or economic conditions that might influence such decisions. Future research could expand the model to include these variables, providing a more comprehensive view of the factors affecting technology adoption in SMEs.

Given the rapid pace of technological change, future research should also explore the impact of emerging technologies such as artificial intelligence and blockchain on SMEs, particularly how these technologies could be leveraged to enhance competitiveness and sustainability. This would not only update the theoretical model used but also provide timely insights relevant to SMEs' strategic planning.

Lastly, the study's focus on Bangladesh offers valuable insights yet also calls for comparative studies across different developing countries to identify cultural and economic variables that may influence technology adoption in varied contexts. Such comparative analyses could help refine technology adoption theories to better reflect the nuances of global economic diversity.

While the study provides important insights into how SMEs in Bangladesh adopt and benefit from SMM and e-business technologies, these limitations highlight opportunities for further research that could deepen understanding and expand the applicability of the findings in the broader context of technology adoption in emerging markets.

7. Conclusions

The findings from this study, which investigated the adoption of e-business and social media marketing (SMM) technologies among small- and medium-sized enterprises (SMEs) in Bangladesh, reveal critical insights into the dynamics of technology utilization in emerging markets. The influence of perceived utility and usability on the adoption rates of new technologies highlights the pivotal role that user perceptions play in the integration and effective use of digital tools in SME operations.

Our research has shown that while user feedback on the utility and simplicity of new technologies does not directly impact the performance of SMM, it significantly alters the rate of technology adoption. This distinction underscores the necessity for SMEs to not only implement technologically advanced tools but also to ensure that these tools are perceived as useful and manageable by their users. The practicality and approachability of new technologies are crucial for their acceptance and sustained use, which, in turn, can drive long-term profitability and market competitiveness.

The theoretical and practical implications of these findings are profound. Theoretically, the study enriches the technology acceptance model (TAM) by contextualizing its application within the SME sector of a developing country, providing a nuanced understanding of how perceived usefulness and ease of use influence technology adoption in a distinct economic and cultural setting. Practically, the results offer actionable strategies for SMEs in both emerging and developed markets to enhance their digital marketing strategies. Given the rapid evolution of the digital landscape, understanding these elements is critical for maintaining competitiveness in a global market.

Moreover, this study suggests an effective collaboration between educational institutions and the SME sector through programs that offer SMM training and support. Such initiatives can bridge the gap between technological potential and actual performance, enhancing the digital capabilities of SMEs. Additionally, government interventions, such as providing easier access to financing and supporting infrastructure development for digital marketing, can further empower SMEs to leverage digital tools for growth and sustainability.

The potential for SMM to outperform traditional forms of advertising significantly is particularly relevant in today's fast-paced business environment. By embracing SMM and other e-business technologies, SMEs can tap into broader markets, engage customers more effectively, and drive revenue growth. Governments and educational institutions play a crucial role in facilitating this transition by providing the necessary training and support.

This study's analysis of 195 SMEs in Dhaka offers a foundation for a deeper exploration of the SME ecosystem in Bangladesh and similar contexts. Future research should aim to provide a more comprehensive examination of the characteristics and factors that contribute to the long-term sustainability of SMEs, including longitudinal studies that can track changes and trends over time.

In conclusion, this research underscores the importance of adapting to technological advancements and highlights how the strategic use of digital marketing technologies like SMM can significantly enhance the operational efficiency and market reach of SMEs. As digital platforms continue to evolve, the ability of SMEs to adapt and integrate these tools into their business models will likely become a critical determinant of their long-term success and sustainability in the global market.

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