E-Commerce Adoption among Small and Medium Enterprises in Ghana

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Abstract

This study investigates the adoption of e-commerce among small and medium enterprises in Ghana. The quantitative survey approach was employed for the conduct of this study. A structured questionnaire was used to obtain data from a sample size of 291 representatives of SMEs across four (4) administrative regions in Ghana. This study applied the binary logistic regression model and Friedman test analytical techniques. The study's findings revealed that most SMEs in Ghana had adopted at least one form of e-commerce level. The study further revealed that the decision to adopt and implement e-commerce among SMEs in Ghana is dependent on perceived relative advantage, IT knowledge of owners/managers, perceived risk/ security factor, and perceived Compatibility with existing infrastructure, culture, and values of the firm. Significant challenges hindering e-commerce adoption among SMEs in Ghana as identified in this study include high internet traffic, cost of running and maintaining e-commerce operations reliability of service, internet connection failures, as well as doubts about having the implementation of economies of scale and scope in alliance with strategic networks, the maintenance of unblemished ethical conduct by retail e-commerce firms, and the incorporation of protection and privacy policy statement on electronic platforms of firms.

Keywords: E-commerce Adoption; Small and Medium Enterprises; Binary Regression Model; Friedman Test.

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1. Introduction

Electronic commerce (e-commerce) has become a priority for business organizations and continues to gain attention within the business environment. Reference [1] explain that e-commerce adoption is an enabler for global competition for small businesses through enhanced efficiency and better customer and supplier relationships. Through e-commerce, competition patterns are evolving. Consumer and supplier interactions and payments are being streamlined and make marketing more flexible and accessible while lengthening business hours worldwide [2]. Organizations that adopt e-commerce are expected to gain several benefits, including reducing transaction costs, automatic product identification, and sharing information efficiently among organizations of the same and different industries. Business organizations, despite their location, are also able to expand their chain of supply and participate in international trade more efficiently and effectively. Reference [3] thus explained that developing countries' competitiveness could be enhanced by e-commerce. However, other studies have revealed that e-commerce marginalizes developing nations and broadens the digital gap, which contradicts [3] assertion. These observations were based on several difficulties developing countries face, including infrastructural problems and restricted diffusion of technical devices and information. Nonetheless, given the dynamic market climate and the need to thrive, SMEs must embrace e-commerce. Adopting innovative and informed e-marketing strategies by SMEs is necessary to remain distinct, profitable, and successful in domestic and international markets. Considering the fundamental role of information communication technology (ICT) in SMEs' development, it is regarded as a socio-economic development enabler and a critical tool for effective political governance. ICT has over the years been utilized by Ghanaians as a critical developmental tool to bridge the digital gap between their trading partners and themselves. Several policies and measures have been put in place over the years to facilitate ICT infrastructural developments and human resource capacity building and encourage ICT use. The Ghana ICT for Accelerated Development (ICT4AD) policy and the ICT sector's liberalization is among the policies and measures. The ICT4AD policy also intended to provide an enabling platform for safeguarding the ICT industry's development and fostering e-commerce and Internet usage in Ghana. One of the critical areas supporting economies' growth and development is small and medium-sized enterprises' operations. Close to an average of 50% of the gross domestic product (GDP) of most high-income countries are contributed by formal small and medium enterprises [4]. Reference [4] further assert that small and medium enterprises contribute almost 60% of employment in the global manufacturing sector on average. According to [5], close to 90% of Africa enterprises are small and medium enterprises and contribute 50% to 60% of employment. Reference [5] further explained that the industry in Ghana is dominated by SMEs and can accelerate wealth creation, economic development, and poverty reduction. A study by [6] also revealed that close to 92% of Ghana's businesses are SMEs, contributing not less than 85% of employment within the manufacturing sector and 70% of the country's Gross Domestic Product (GDP). The significance of SMEs' to the Ghanaian economy can thus not be over-emphasized. According to [7], few SMEs are taking advantage of the vast array of benefits of e-commerce, notwithstanding the increasing awareness of and passion for online platforms in business activities, including marketing and sales. A report by the United Nations Conference on Trade and Development in 2004 revealed that, despite the revenue growth, employment from e-commerce, and the number of SMEs involved in e-commerce, e-commerce adoption among SMEs is mainly limited to industrialized countries. The United Nations Conference on Trade and Development

indicates that Africa and Latin America account for less than 2% of global e-commerce while more than 95% occur in developed countries. This situation presents a high disparity of benefits spread. An empirical study on e-commerce development in Ghana, an African country, is necessary to provide enough literature for academic reference for further studies in e-commerce development, particularly in the African region. This study's findings could also provide the basis for developing theoretical models of e-commerce adoption and usage. Despite the numerous policies and measures for the development of e-commerce, Ghana lags behind other countries, including South Africa, in terms of e-commerce performance [8]. Additionally, SMEs in Ghana seem oblivious to the benefits associated with e-commerce. According to [9], SMEs' unawareness of the critical potential of e-commerce is a significant barrier to its adoption, which is a big challenge for the development of e-commerce, especially in Ghana. Considering the significant role of SMEs in the Ghanaian economy, internet and e-commerce adoption remains a vital tool for effective competition among SMEs [2]. As a result, SMEs will understand better the evolution of e-commerce and the factors that affect e-commerce adoption, helping them find new ways to draw customers to their goods and services, thus growing their global market presence [10]. The lack of empirical studies on the growth of e-commerce through its adoption in developing countries, especially in Sub-Saharan Africa, creates a significant gap that must be addressed. This study aims to fill a void in the e-commerce literature by identifying the driving forces behind SMEs' adoption of e-commerce in Ghana. Concentrating on owners/managers and firm-level characteristics, this study will employ the logit model, which is the first of its kind to assess the driving forces of e-commerce adoption among SMEs in Ghana.

1.1 Scope and Limitations of the Study

E-commerce as a field of study is relatively broad. Thus, an empirical study of the subject as a whole, requires a lot of time and financial resources. In an effort to finish this project within the required academic period, the scope of the study was limited to the adoption of e-commerce among SMEs in Ghana. This study is limited to survey data from small and medium enterprises in Ghana. Considering that, there are a lot of SMEs across the sixteen (16) administrative regions of Ghana, the study only covered four (4) of the sixteen (16) administrative regions. The study covers SMEs operating within all three major sectors (Service, Manufacturing, and Agricultural). The SMEs were selected from four (4) of the sixteen (16) administrative regions of Ghana.

2. Materials and Methods

2.1 Research Design

This study is quantitative. The descriptive survey research approach was adopted for the conduct of this study. The choice of this design is aimed at conducting a more comprehensive investigation of e-commerce among small and medium enterprises. A survey, according to [11] is designed to provide information about the extent of agreement among members of a sample about a specific situation. As a result, the survey approach is considered to be more suitable for achieving the study's research objectives.

2.2 Population

The focus of this study was on small and medium enterprises in Ghana. Thus, the targeted population of this

study was the registered small and medium enterprises in Ghana. According to the Association of Ghana Industries (AGI), the number of registered small and medium enterprises in Ghana stands at 1,200 enterprises. They include enterprises belonging to the economy's three major sectors, i.e., manufacturing, service, and agricultural sectors.

Table 1: Distribution of Targeted Population

Region	Number
Service	691
Manufacturing	302
Agriculture	207
Total	1200

Source: Authors Work, 2021

2.3 Sample Size and Sampling Technique

It is universally accepted that an entire population of a study can't be studied. This is due to the difficulty of a researcher gaining access to the whole target population considering the size of the population, time constraints, and the cost involved. This challenge in empirical studies is usually addressed using a representative sample [12]. Because the entire population of this study can't be covered, a sample of the population was used for the study's conduct. A total sample of two hundred and ninety-one (291) respondents determined from the sampling formula below was used for the study.

$$s = \frac{X^2 NP(1 - P)}{d^2(N - 1) + X^2 P(1 - P)} \qquad Eqn(1)$$

Where: n = the sample size,

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N = the population size, P= the population proportion (assumed to be 0.50, since this would provide the maximum sample size, = the degree of accuracy expressed as a proportion (0.05). Based on the distribution of the targeted population, in terms of the SMEs' sectors, a proportionate ratio (33.3%) was applied to the number of SMEs in each sector. This technique provided a sample size of 228, 99, and 68 for the service, manufacturing, and agriculture sectors. Since the total was more than the sample size of 291 SMEs required for the study, the researcher, by convenience, reduced each sector's proportion to match up with the required total sample of 291. Hence 203, 46, and 42 SMEs were selected from the service, manufacturing, agriculture sector, respectively. The respondents of the study were selected using the stratified, purposive, and convenience sampling techniques. The stratified technique was used to classify the enterprises according to the various

sectors (manufacturing, service, and agricultural). The stratified sampling technique was used to select SMEs from four different regions of the country: Greater Accra, Central, Ashanti, and Western Regions. The stratified sampling technique ensured that enterprises from the various sectors (strata) are included in the study to avoid selection bias. This ensured a broad and fair representation of the target population. The study further employed the purposive sampling technique to ensure the selected respondents from the various enterprises possessed the required knowledge and professional skills concerning the subject under study. The purposive sampling technique was used to select individuals with in-depth knowledge about e-commerce and its implementation in their enterprises.

Table 2: Sample Distribution of Respondents on a Regional basis

Region	Sectors of SME			
	Service	Manufacturing	Agriculture	Total
Greater Accra	70	20	18	108
Ashanti	51	12	10	73
Western	41	7	7	55
Central	41	7	7	55
Total	**203**	**46**	**42**	**291**

Source: Authors Work, 2021

2.4 Data Source and Collection Method

Data can be sourced from two main sources, namely primary and secondary data. Secondary data basically refers to data that exist already or compiled for some other purposes by people other than the one using it. Primary data, on the other hand refers to data gathered by individuals or groups for the first time for their own purposes. Survey and experimental data are examples of primary data [13]. This study employed primary data for it conduct. For the purpose of this study, structured online questionnaires were administered to obtain the required data. This data method was employed as it is the most common data collection method in a survey. Due to the outbreak of the COVID-19 pandemic, face-to-face data collection, which is usually employed in survey studies, was impossible; hence the researcher designed an electronic version of the structured questionnaire, making it possible for respondents to participate in the study online.

2.5 Data Analysis Method

2.5.1 Friedman Test

As applied by [14] in their study, the Friedman test was used to assess the strategies adopted by SMEs for the successful adoption and usage of e-commerce systems and identify the challenges hindering the adoption and usage of e-commerce among SMEs in Ghana. The Friedman test compares three or more related samples and

makes no assumptions about the data's underlying distribution. It involves ranking the data in rows and then comparing the mean rank in each column. The Friedman test was thus used to prioritize the strategies for the successful adoption and usage of e-commerce among SMEs and the challenges that hinder this implementation in terms of the influence percentage of SMEs from various Ghana regions.

2.5.2 Binary Logit Model

Previous studies have studied the determinants or factors that influence the adoption of e-commerce among small and medium enterprises using several analytical methods. Reference [2] used the SEM technique under smart partial least squares in their study. As far as the study of the adoption and usage of e-commerce among SMEs is concerned, no empirical study has used the binary logit model to assess the determinants of e-commerce adoption and usage among SMEs. Thus, this study used the logit model to analyze the determinants of e-commerce adoption and usage among SMEs in Ghana. The Logit model was used to estimate the probability of the determinants of e-commerce adoption to influence e-commerce adoption and usage among SMEs in Ghana. The logit model is a subset of general binary options models for which the dependent variable is dichotomous. The binary logit model can be applied to the Dichotomous Model Function Relationship Response Variables. Based on the binary nature of the dependent variable, the logit model will be employed. The functional form of the logit model of a binary response is specified as follows:

$$Logit(D_1) = In\left[\frac{D_1}{1 - D_1}\right] \qquad\qquad Eqn(2)$$

Where the Ratio $\left[\frac{D_1}{1-D_1}\right]$ is the odds that $Y_1 = 1$

The formula is converted into the functional logit equation form as

$$\left(\frac{D_1}{1 - D_1}\right) = f(x) \qquad\qquad Eqn(3)$$

Where X is an explanatory variable to be expanded

Where the X can be expanded as RA, CP, IK, SC, PCT, and PCM

The linear form of the logit equation can be written as:

$$EA = \delta_0 + \delta_1 RA + \delta_2 CP + \delta_3 IK + \delta_4 SC + \delta_5 PCT + + \delta_6 PCM + \varepsilon \qquad\qquad Eqn(4)$$

Where: EA is the log odds of adopting e-commerce by SMEs. RA represents the relative advantage factors such as the global presence of product and service (gps), provision of quick and latest information (pqi), increment in productivity and employee performance (ipe), and saving of time and effort (ste). CP represents the competitive pressure factors such as competitors already using e-commerce for business (ceb), trading partners' expectation of e-commerce service (tpe), and support for better competition (sbc). IK represents IT Knowledge factors

which include knowledge on how e-commerce improves business (kis), knowledge on how e-commerce improves business (kib), and availability of technical knowledge and skills (ats).

2.6 Measurement of variables

Table 3: Variable Description and Expected Sign

Variable Type	Variable	Factor Loadings	Mode of Measurement of Factor Loadings	Expected sign
Dependent Variable	E-commerce Adoption	Availability of emails and websites for transactions Availability of websites for communication Advertising website Emails for business purposes	1 if it is adopted adoption, 0 if otherwise	
Explanatory Variable	Relative Advantage (RA) Factor	Global presence of products and services (gps)	1 if it influences e-commerce adoption, 0 if otherwise	+
		Provision of quick and latest information (pqi)		+
		Increment in productivity and employee performance (ipe)		+
		Saving of time and effort (ste)		+
	Competitive Pressure (CP)	Competitors already use e-commerce for business (ceb)	1 if it influences e-commerce adoption, 0 if otherwise	+
		Trading partners expectation of e-commerce service (tpe)		+
		Support for better competition (sbc)		+
		Industry Pressure to Adopt e-commerce (ipa)		+
	IT Knowledge (IK) Factor	Knowledge on how e-commerce improves sales (kis)	1 if it influences e-commerce adoption, 0 if otherwise	+
		Knowledge on how e-commerce improves business (kib)		+
		Availability of technical knowledge and skills (ats)		+
		Good understanding of how the internet can improve business operations		+
	Security Factor	Exposure of business transactions to a third party (ebt)	1 if it influences e-commerce adoption, 0 if otherwise	-
		Trust that the internet can protect the confidential data (tip)		+
		The risk involved in online business (rob)		-
		Customer unwillingness to use due to privacy and security (cps)		-
	Perceived Cost Factor	Cost of infrastructure needed (cin)	1 if it influences e-commerce adoption, 0 if otherwise	-
		Cost of sustaining recurring cost of broadband (crc)		-
	Perceived Compatibility Factor	Compatibility with business process (cbp)	1 if it influences e-commerce adoption, 0 if otherwise	+
		Compatibility with business value (cbv)		+
		Compatibility with business infrastructure (cbi)		+
		Compatibility with business culture (cbc)		+

Source: Author's Work, 2021

SC represents Security factors such as exposure of business transactions to the third party (ebt), trust that the

internet can protect the confidential data (tip), the risk involved in online business (rob), and customers' unwillingness to use e-commerce due to privacy and security (cps). PCT represents Perceived Cost factors such as cost of infrastructure needed (cin) and cost of sustaining recurring cost of broadband (crc). PCM represents Perceived Compatibility factors such as Compatibility with business process (cbp), Compatibility with business infrastructure (cbi), Compatibility with business value (cbv), and Compatibility with business culture (cbc). The various factors of e-commerce adoption were assessed using a five-point Likert-scale ranging from 1 to 5. Participants in this study indicated the influence of the various factors on their decision to adopt and implement e-commerce in their businesses by rating the constructs with 1 to 5. Constructs rated below an average of 3 were considered to have no influence on participants' e-commerce adoption and thus assigned 0. In contrast, constructs rated three (3) and above were considered to influence participants' e-commerce adoption decisions and thus assigned 1. A summary of the description and measurement of the factors are presented in table 3 below.

3. Results

3.1 Demographic Characteristics of Respondents

Table 4 below presents the demographic characteristics of the individuals who represented the various SMEs selected for the study. Among the variables presented on the table are the gender distribution, educational qualification, status in the organization, and respondents' years of experience. Data on gender, educational qualification, and status in the organization were captured as continuous, while years of experience were categorical.

Table 4: Demographic Characteristics of the Respondents

Variable		Frequency	Percent
Gender	Male	156	53.6
	Female	135	46.4
Educational Qualification	Senior High School	31	10.7
	Diploma/Higher National Diploma	10	3.4
	Bachelor	157	54.0
	Post Graduate	86	29.6
	Professional Certificate	7	2.4
Status in Organisation	Owner	93	32
	Manager	73	25.1
	IT Officer	36	12.4
	Administrator	38	13.1
	E-Marketing Officer	51	17.5
Years of Experience	Less than a year	61	21.0
	1-5 years	145	49.8
	6-10 years	67	23.0
	More than 10 years	18	6.2

Source: Author's Work, 2020

Variables such as educational qualification, status in the organization, and years of experience of respondents in the organization were captured to give a clear picture of the skills/experience capabilities of the respondents. This provides some level of information with regards to the reliability of the data provided by the respondents.

As presented in table 4, the majority of the respondents are males. Specifically, 156 respondents representing 53.6% of the total respondents are males, while 135 respondents representing 46.4%, are females. According to [15], a premium is not placed on Ghanaian women's education, which generally results in women not acquiring a higher education level. Consequently, most women tend to become unskilled and not fitted to occupy positions in organizations. The assertion by [15] thus supports the findings of this study regarding the gender distribution of respondents. Regarding the respondents' educational qualifications, most of the respondents hold bachelor's degrees, while few hold professional certificates. Statistically, 157 of the respondents representing 54% of the total sampled respondents, had bachelor's degrees. The study results also show that 86 respondents representing 29.6% of the total respondents, hold post-graduate certificates. Respondents holding senior high school, diploma, and professional certificates are 10.7%, 3.4%, and 2.4%, respectively. The respondents' educational qualifications who represented the sampled SMEs for the study show that the respondents possess an essential educational qualification to support e-commerce adoption. The results further reveal that majority of the respondents have a tertiary educational background. The analyzed data also indicates that respondents who represented the various sampled SMEs are critical stakeholders of the organizations and possess adequate and technical knowledge of e-commerce adoption by their organizations. Statistically, 93 respondents representing 32% of the total respondents, are owners of the organization they represented in the study. The results also show that 73 respondents representing 25.1% of the total respondents are managers of the organization they represented in the study. In comparison, 51 respondents representing 17.5% are e-marketing officers of their organizations. The results further reveal that 13.1% and 12.4% of the respondents are IT officers and their organizations' administrators. Results presented in table 4 above also show that majority of the respondents have been associated with their respective organizations for more than a year. These results indicate that such respondents' responses are reliable as they have been with the organisation for enough time to have a fair idea of its e-commerce adoption situation. Specifically, a cumulative number of 230 respondents representing 79% of the total respondents have been associated with their organizations for more than one year. The results show that only 21% of the respondents have been associated with their organizations for less than a year.

3.2 Profile of Business Organisations

This section of the chapter presents a detailed profile of the various SMEs sampled for this study's conduct. Sub-sections discussed under this section include the economic sector under which the SME operates and the number of employees engaged by the organization.
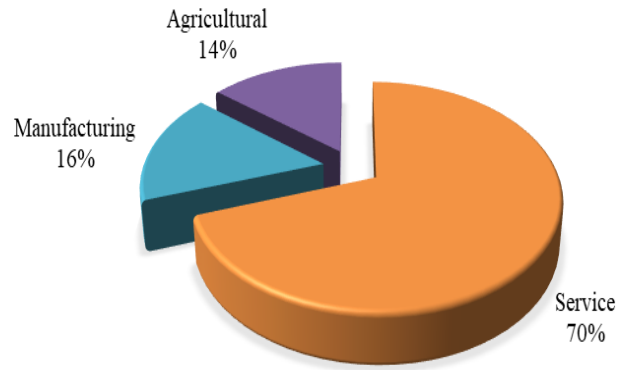
3.2.1 Sector of Business Organisation

Figure 1: Sector of Business Organisation

Figure 1 above displays the sector distribution of the sampled SMEs for this study. The results as displayed in the figure above indicate that most SMEs belong to the service sector of the economy. As displayed in the figure, a significant portion of 70% of the sampled SMEs operates under the Ghanaian economy's service sector. In contrast, 16 and 14 percent operate under the manufacturing and agricultural sectors, respectively. This result is consistent with the Ghanaian economy structure reported by the Ghana Statistical Service, which indicates that the service sector forms a more significant portion of the Ghanaian economy. The result of this study in this regard is thus not surprising.
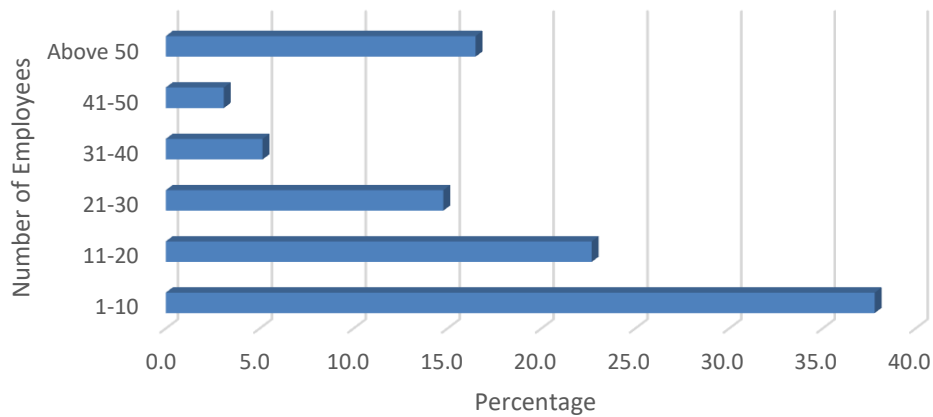
3.2.2 Number of Employees

Figure 2: Number of Employees

In terms of human resource engagement, the study reveals that most SMEs' employed human resources range between 1 to 10 employees, followed by SMEs with a human resource capacity of 11 to 20. Results of the analyzed data, as displayed in figure 4.2, show explicitly that 110 SMEs representing 37.8% of the sampled SMEs have engaged a human resource capacity ranging from 1 to 10. In comparison, 66 SMEs representing

22.7% have a human resource capacity of 11 to 20. Cumulatively about 60% of the SMEs have a human resource capacity of 1 to 20. The results also indicate that 16.5% of the SMEs have more than 50 employees' human resource capacity. Considering the number of SMEs formerly registered in Ghana and the number of employees engaged by these SMEs, it is undoubtedly clear that SMEs contribute significantly to economic growth in diverse ways.

3.3 Reliability Analysis

As proxies of the constructs of e-commerce adoption factors, the need for a test to ascertain whether the items used to measure the various factors/determinants of e-commerce adoption essentially measured the very constructs they were intended to measure and the degree to which they measured the construct. To check the reliability and validity of the measures, this study employed the Alpha Cronbach's test to assess the internal consistency of the scales used. The value of Alpha Cronbach's measurement ranges between 1 and 0. According to [16], scales or measures with Alpha Cronbach's value above a threshold of 0.70 are accepted and retained for analysis. Those with values below the 0.70 thresholds are to be removed from the dimension they seek to measure. Factor analysis was further conducted to confirm the reliability and suitability of the measures. To assess the degree of inter-correlations among the measures and the sampling adequacy, Bartlett's test of sphericity and the Kaiser-Meyer-Olin (KMO) test were conducted, respectively. According to Tabachnick and Fidell (2007), a p-value less than 0.05 significance level for Bartlett's test and KMO index of 0.6 is are the thresholds required to make the data suitable for factor analysis. The study conducted these tests on the datasets for the seven (7) factors of e-commerce adoption in line with the acceptable thresholds. Results of the reliability and factor analysis are presented in table 5 and table 6 below.

Table 5: Reliability and Factor Analysis

Item	Cronbach's Alpha	Bartlett's test of sphericity		KMO	
		Recommended Value	Calculated value	Recommended Value	Calculated value
EA	0.748	<0.05	0.000	>0.6	0.719
RA	0.813	<0.05	0.000	>0.6	0.733
CP	0.749	<0.05	0.000	>0.6	0.741
IK	0.720	<0.05	0.000	>0.6	0.663
SC	0.784	<0.05	0.000	>0.6	0.782
PCT	0.757	<0.05	0.000	>0.6	0.602
PCM	0.893	<0.05	0.000	>0.6	0.839

Source: Author's Work, 2020

The results shown in table 5 above indicate that all the seven (7) dimensions used to assess the determinants or factors of e-commerce adoption passed the reliability test with Alpha Cronbach's value for all the dimensions crossing the standard threshold of 0.70. The suitability of the dataset for factor analysis is confirmed by the results obtained for Bartlett's test of sphericity and Kaiser-Meyer-Olin (KMO) test. As displayed in table 5, the calculated values of Bartlett's test and Kaiser-Meyer-Olin (KMO) test for all the seven (7) dimensions satisfy the standard thresholds of the two tests.

3.4 Factor Analysis

This study further employed the varimax rotational method to ascertain how the various extracted factors were loaded together. This was aimed at detecting or finding the items that are highly loaded together on the extracted factors. According to [17], the varimax rotational method describes the association between the items and the extracted factors by revealing the contribution the item makes to each factor, despite its preferably expected that each item should load highly on a single factor. Reference [18] recommends an acceptable factor loading and communalities threshold of 0.5. As presented in table 6 below, all the factor loadings and communalities of the items recorded values above 0.5; thus, all the items satisfy the criteria for inclusion in the study's analysis.

Table 6: Extracted Factors

	EA	RA	CP	IK	SC	PCT	PCM	Communalities	Item Total Correlations
EA1	0.822							0.704	0.603
EA2	0.855							0.741	0.589
EA3	0.778							0.630	0.547
EA4	0.745							0.695	0.531
RA1		0.738						0.545	0.557
RA2		0.858						0.735	0.726
RA3		0.784						0.614	0.592
RA4		0.840						0.706	0.679
CP1			0.767					0.588	0.550
CP2			0.850					0.722	0.675
CP3			0.736					0.542	0.511
CP4			0.678					0.560	0.510
IK1				0.896				0.805	0.648
IK2				0.766				0.668	0.594
IK3				0.905				0.824	0.637
IK4				0.980				0.961	0.163
SC1					0.819			0.670	0.642
SC2					0.711			0.506	0.511
SC3					0.816			0.666	0.639
SC4					0.767			0.589	0.576
PCT1						0.899		0.807	0.615
PCT2						0.899		0.807	0.615
PCM1							0.861	0.742	0.750
PCM2							0.890	0.792	0.794
PCM3							0.840	0.706	0.720
PCM4							0.890	0.793	0.794
VIF		1.64	2.53	1.88	1.85	1.29	2.14		

Table 6 also shows the observed VIF values for the variables in the current study model, which are at acceptable thresholds of less than 5 as recommended by [19], indicating no problem of multicollinearity among the variables.

3.5 Descriptive Statistics of Variables

Table 7: Descriptive Statistics of Main Variables

	Obs	Mean	Std. Deviation	Min	Max
E-commerce Adoption (EA)	291	3.6581	0.8719	1	5
Relative Advantage (RA)	291	4.1426	0.7745	1.5	5
Competitive Pressure (CP)	291	4.0808	0.6624	1	5
ICT Knowledge (IK)	291	3.7517	0.8003	1.5	5
Security (SC)	291	3.4820	0.7883	1.25	5
Perceived Cost (PCT)	291	3.7517	0.9271	1	5
Perceived Compatibility (PCM)	291	3.8204	0.8251	1	5

Source: Author's Work, 2020

Displayed in table 7 above are the descriptive statistics of the main variables of this study. The statistics include the number of observations, mean, standard deviation, minimum values, and the maximum values of the variables. It is observed from the statistics above that, all the variables recorded average (mean) responses above 3. The e-commerce adoption, competive pressures, perceived cost, and perceived compatibility variables recorded values as low as 1 and values as high as 5 on the five (5) point Likert-Scale. The relative advantage, and ICT knowledge variables recorded values as low as 1.5 and values as high as 5. Finally, the security variable recorded values as low as 1.25 and values as high as 5.

3.6 E-commerce Adoption and Usage among Small and Medium Enterprises in Ghana

This study sought explicitly, among other objectives, to examine the level of e-commerce adoption and usage among small and medium enterprises in Ghana. The adoption and usage of e-commerce in this study were assessed with four (4) items/constructs. The constructs/items sought, among other things, to investigate the use of e-commerce tools such as websites and emails by the sampled SMEs in their business operations. Respondents indicated their agreement or otherwise of the constructs/items for e-commerce adoption using a five-point Likert scale of 1 to 5, with 1 representing "strongly disagree" and 5 representing "strongly agree." An average mean of the responses above 3.0 indicates that the respondents generally agree with the constructs/items, indicating the adoption of e-commerce among small and medium enterprises in Ghana.

Table 8: E-commerce Adoption among Small and Medium Enterprises in Ghana

	Median	Mean	Std. Deviation
We have emails and a website that allows for ads, comprehensive displays of the company's goods and services, online inquiry, ordering, and transaction processing (for example, on-line sales and online payment all through the internet).	4	3.4536	1.2065
We have emails and a website that allow for ads, a comprehensive display of the company's goods and services, searching, form-filling, and online inquiry/booking/reservation, among other things.	4	3.6082	1.1705
For advertising purposes, we have a simple website with limited email contact.	4	3.5670	1.0914
In our organization, we only use email for business purposes (No company website)	4	4.0034	1.0488
Average Mean and Standard Deviation		**3.6581**	**1.1293**

Source: Author's Work, 2020

The results presented in table 8 above show that most small and medium enterprises in Ghana use emails and websites that allow for advertising, detailed display of the company's products & services, online inquiry, online ordering, and on-line transaction processing (M = 3.4536). The results also indicate that most small and medium enterprises use emails and websites that allow for searching, form-filling, on-line inquiry/ booking/ reservation (M = 3.6082). The results, as displayed in table 8, further reveals that most of the small and medium enterprises in Ghana have a simple website for advertising purpose and minimum interaction using emails (M = 3.5670) as well as emails at least for business purposes (M = 4.0034), indicating that basic tools of e-commerce are available among most of the small and medium enterprises in Ghana. This study's results, as displayed in table 8 above, clearly indicate that all the three levels of e-commerce adoption include non-interactive, interactive, and stabilized e-commerce adoption levels proposed by [20], exist among SMEs in Ghana. Overall, the average mean of 3.6581, as reported in table 8 above, indicates that e-commerce adoption is high among most small and medium enterprises in Ghana.

3.7 Determinants of E-commerce Adoption and Usage among Small and Medium Enterprises

Following the assessment of the level of e-commerce adoption among SMEs in Ghana, this study further sought to identify the various determinants or factors that influence SMEs' e-commerce adoption decisions in Ghana. Constructs/variables that recorded a mean value of 3 and above were coded 1 to indicate their contribution to SMEs' e-commerce adoption decision, while those that recorded a mean value less than 3 were coded 0 to indicate otherwise. The binary logit regression model was then employed to analyze the determinants or factors of e-commerce adoption among SMEs in Ghana.

Table 9: Determinants of E-commerce Adoption and Usage among Small and Medium Enterprises

	Variable	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]	
Relative Advantage (RA) Factors	gps	62.9484	57.8972	4.50	0.000***	10.3773	381.8417
	pqi	4.9313	5.2783	1.49	0.136	0.6052	40.1845
	ipe	0.0868	0.0876	-2.42	0.015**	0.0120	0.6277
	ste	4.9850	3.0031	2.67	0.008***	1.5307	16.2354
Competitive Pressure (CP) Factors	ceb	3.8692	3.5345	1.48	0.139	0.6457	23.1840
	tpe	1.0096	0.9803	0.01	0.992	0.1505	6.7717
	ecb	2.6786	2.0833	1.27	0.205	0.5832	12.3011
	ipa	2.2590	2.0679	0.89	0.373	0.3756	13.5862
IT Knowledge (IK) Factors	kis	5.3220	2.9053	3.06	0.002***	1.8255	15.5151
	kib	3.9146	3.1423	1.70	0.089*	0.8117	18.8781
	ats	0.3664	0.1808	-2.03	0.042**	0.1393	0.9640
	uiu	2.2068	1.3217	1.32	0.186	0.6822	7.1380
Security (SC) Factors	ebt	2.1385	0.8535	1.90	0.057*	0.9782	4.6754
	tip	0.0427	0.0442	-3.05	0.002***	0.0056	0.3249
	rob	0.1061	0.1267	-1.88	0.060*	0.0102	1.1017
	cps	1.3705	0.6001	0.72	0.472	0.5810	3.2328
Perceived Cost (PCT) Factors	cin	0.5532	0.3334	-0.98	0.326	0.1698	1.8028
	crc	0.9366	0.5616	-0.11	0.913	0.2892	3.0338
Perceived Compatibility Factors	cbp	14.4120	14.3127	2.69	0.007***	2.0577	100.9393
	cbv	0.0585	0.0883	-1.88	0.060*	0.0030	1.1262
	cbi	18.0421	19.5115	2.67	0.007***	2.1665	150.2506
	cbc	0.7155	0.8029	-0.30	0.765	0.0793	6.4537
	_cons	0.8083	0.6420	-0.27	0.789	0.1704	3.8342

```
Number of obs     =      291
LR chi2(20)       =    96.40
Prob > chi2       =    0.000
Pseudo R2         =    0.6715
Log likelihood  =  -129.41898
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Source: Authors Work, 2020   *p < 0.1*   p < 0.05**   p < 0.001****

3.7.1 Relative Advantage Determinants

It could be observed from the results that three of the four variables under the relative advantage factor are significant predictors of e-commerce adoption and positive as expected. The results revealed specifically that adopting e-commerce to gain a global presence for products and services (gps) is a significant predictor of e-commerce adoption (β = 62.9484, $p < 0.01$). This indicates that the ability of e-commerce to help SMEs advertise their products and services across the globe plays a significant role in their decision to adopt e-commerce. It is further observed that e-commerce's ability to increase productivity and employee performance (ipe) (β = 0.0868, $p < 0.05$), and save time and effort (ste) (β = 4.9850, $p < 0.01$) predict e-commerce adoption significantly. This indicates that e-commerce can increase productivity and employee performance and save time and effort, influencing SMEs' decision to adopt e-commerce significantly. The results, however, show that the ability of e-commerce to provide quick and latest information (pqi) does not influence e-commerce adoption

significantly ($\beta = 4.9313$, $p > 0.1$). It could be concluded holistically from the results obtained for all the variables under the relative advantage factor that relative advantage is a significant determinant of e-commerce adoption in Ghana. This finding suggests that the perceived benefits associated with e-commerce adoption influence SMEs' decision to adopt e-commerce. This finding is consistent with [21], who found perceived relative advantage as a significant determinant of SMEs e-commerce adoption. The finding is also supported by the findings of [22]. They found that the perceived relative advantage of e-commerce is one factor that influences SME owners and managers' decision to adopt e-commerce.

3.7.2 Competitive Pressure Determinants

Results presented in Table 9 shows that all the four variables that measure the competitor pressure factor are insignificant predictors of e-commerce adoption among SMEs though positive as expected. The results show that competitors' use or adoption of e-commerce (ceb) does not significantly influence SMEs to adopt e-commerce as well ($\beta = 3.8692$, $p > 0.1$). This result indicates that SMEs do not necessarily consider using e-commerce by their competitors before adopting e-commerce. The results also reveal that expectation of e-commerce adoption by trading partners (tpe) does not influence the e-commerce adoption decision of SMEs significantly ($\beta = 1.0096$, $p > 0.1$). Thus, SMEs do not essentially adopt e-commerce based on the expectations of their trading partners. The results further report that adopting e-commerce in order to compete better (ecb) is not a significant predictor of e-commerce adoption ($\beta = 2.6786$, $p > 0.1$). Primarily, this result indicates that SMEs' decision to adopt e-commerce is not essentially influenced by their quest to compete better. Finally, pressure from the industry within which an SME operates was not proven to be a significant predictor of e-commerce adoption per the results obtained ($\beta = 2.2590$, $p > 0.1$). Therefore, a conclusion could be made intuitively from the results obtained for all the four variables that competitive pressure is not a significant factor or determinant of e-commerce adoption among SMEs. This finding confirms the finding of [23], who found that suppliers' and competitors' pressure did not influence e-commerce adoption among SMEs in Indonesia and Malaysia, respectively. On the contrary, this study's finding did not support the argument of [24]. They argued in support of competitive pressure as a significant determinant of e-commerce adoption. The finding of this study is also inconsistent with the findings of [25]. They found in their study that trading partners and competitors influence e-commerce adoption among SMEs in Jordan.

3.7.3 IT Knowledge Determinants

Among the four variables of the IT knowledge factor, three significantly predict e-commerce adoption. Specifically, knowledge on how e-commerce improves sales (kis) is a significant predictor of e-commerce adoption ($\beta = 5.3220$, $p < 0.01$), an indication that e-commerce adoption by SMEs is dependent on how informed they are about the contributions of e-commerce to sales enhancement. It is also observed from the results that knowledge on how e-commerce improves business (kib) ($\beta = 3.9146$, $p < 0.1$), as well as the availability of technical knowledge and skills (ats) ($\beta = 0.3664$, $p < 0.05$) significantly predict e-commerce adoption by SMEs. A good understanding of how the internet can be used to improve business operations (uiu), however, does not predict e-commerce adoption significantly ($\beta = 2.2068$, $p > 0.1$). Based on the four variables' results, the data provide sufficient evidence to support IT knowledge as a significant determinant of e-commerce

adoption among SMEs. This finding is consistent with [26], who found that top management's IT-related experience has a positive influence on e-commerce adoption among SMEs in Nigeria. Contrary to this study's finding, Reference [27] found that owners/managers' IT knowledge and experience do not influence e-commerce adoption among the Iranian SMEs.

3.7.4 Security Determinants

Regarding the security factor, the study results show that security is an essential factor in adopting e-commerce among SMEs. Statistically, the results indicate that three of the four variables that measured the security dimension were significant. The results of the study specifically show that issues regarding possible exposure of business transactions to a third party (ebt) are a significant predictor of e-commerce adoption ($\beta = 2.1385$, $p < 0.1$). It is also observed from the results that SMEs' trust for the internet to protect confidential data (tip) significantly influences their e-commerce adoption decision ($\beta = 0.0427$, $p < 0.01$). The risk involved in online business (rob) was found to be a significant predictor of e-commerce adoption ($\beta = 0.1061$, $p < 0.1$), indicating that SMEs are essentially concerned about the safety of their transaction on the internet. However, the result of the study revealed that customers' unwillingness to use e-commerce due to privacy and security (cps) does not significantly predict its adoption. Considering the number of significant variables under the results' security factor, a conclusion could be drawn that security is a significant factor in e-commerce adoption. This finding is consistent with [14], who found that uncertainty regarding the security and privacy of e-commerce transactions is a barrier to e-commerce adoption among SMEs in India, Malaysia, and Iran. The finding of this study further supports the finding of [28]. They found that perceived risk of e-commerce and trust issues constitute barriers to e-commerce adoption among SMEs in Nigeria. However, this study's finding did not support the finding of [22]. They found that security is not a factor that influences e-commerce adoption among SMEs in South Africa.

3.7.5 Perceived Cost Determinants

E-commerce adoption by SMEs, as explained by literature in chapter three of this study, could be influenced by the perceived cost of implementation. Empirical determination of this disposition in this study, however, reveals otherwise. The results of this study, as presented in Table 9 above, shows explicitly that the cost of infrastructure needed (cin) to adopt e-commerce is not a significant predictor of e-commerce adoption ($\beta = 0.0427$, $p < 0.01$). It is also observed from the results that the cost of sustaining the recurring cost of broadband (crc) does not significantly predict e-commerce adoption by SMEs. It is evident from the two variables that perceived cost does not significantly influence e-commerce adoption. The finding of this study is consistent with the finding of [24]. They found that the perceived cost of adopting e-commerce does not influence SMEs' adoption of e-commerce in Indonesia. However, the finding of this study contradicts the finding of [27], who found that perceived cost e-commerce adoption is one of the factors that influence SMEs' adoption of e-commerce in developing countries.

3.7.6 Perceived Compatibility Determinants

Perceived compatibility with existing firm systems and values is argued to be a possible influential factor of e-

commerce adoption among SMEs. An empirical assessment of this disposition shows that perceived compatibility influences e-commerce adoption significantly. As presented in Table 9, only one of the four variables under the perceived compatibility factor does not significantly predict e-commerce adoption. Specifically, compatibility of e-commerce with business process (cbp) was found to predict e-commerce adoption significantly (β = 14.4120, p < 0.01). This finding indicates that how e-commerce fits with the processes of business influences its adoption. The compatibility of e-commerce with the values of a business (cbv) was also found to influence its adoption significantly (β = 0.0585, p < 0.1). It was further revealed that the compatibility of e-commerce with business infrastructure (cbi) predicts e-commerce adoption significantly (β = 18.0421, p < 0.01). Thus, how e-commerce fits a firm's existing infrastructure is essential to its adoption by the firm. However, the compatibility of e-commerce with business culture (cbc) does not predict e-commerce adoption significantly. Based on these results, it is evident that perceived compatibility is a significant factor in e-commerce adoption among SMEs in Ghana. Reference [23] found that perceived compatibility is one of the factors that influence SMEs' adoption of e-commerce, consistent with the findings of this present study. However, this study's finding is inconsistent with the finding of [24]. They found that perceived compatibility is not one factor that influences SMEs' adoption of e-commerce among Indonesian SMEs.

3.8 Challenges of E-commerce Adoption and Usage among SMEs in Ghana

Among the specific objectives set out in this study to be achieved was identifying the challenges of e-commerce adoption in Ghana. The Friedman test was employed in the analysis of the data collected. The Friedman test is used for one-way repeated measures analysis of variance by rank. This analytical technique provided the mean rank of the identified challenges, which enabled the researcher to identify the challenges in order of prevalence. The results of the Friedman test are shown in table 10 below.

Table 10: Challenges of E-commerce Adoption among SMEs in Ghana

Item	Mean Rank
High internet traffic	4.91
Unsolicited e-mail	5.56
Running and maintenance more costly than expected	5.25
Internet connection failures	5.51
Reliability of service s	5.35
Lack of knowledge and understanding of e-commerce	5.66
Constant customer complaints on difficulties in finding websites	5.54
Doubts about security and privacy	5.52
Lack of user support	5.96
Poor advice from user support representatives	5.66

Source:Author's Work, 2020

As presented in Table 10 above, it is observed that the most prevailing challenge of e-commerce adoption among SMEs in Ghana is high internet traffic, which recorded the least mean rank of 4.91. This finding is expected as internet connectivity in Ghana is generally slow. The study results also reveal that the cost of

running and maintaining e-commerce operations is more costly than expected, which is a great challenge to the adoption and usage of e-commerce. Generally, the cost of the internet in Africa and Ghana is expensive due to the unavailability of domestically manufactured IT infrastructure and technologies. Therefore, it is not surprising that the cost of running and maintaining e-commerce among SMEs in Ghana is a prevailing challenge. This finding is consistent with the finding of [29], who found that the perceived cost of adopting e-commerce is one of the barriers to e-commerce adoption among Nigerian SMEs. The finding of this study is also supported by the finding of [28]. They observed that many SMEs in Nigeria lack resources to procure computers and necessary broadband Internet connectivity equipment, including sustaining the recurring cost of broadband Internet subscriptions. Another challenge that came up strongly, as reported by the study results, is the lack of confidence on the part of SMEs in the service providers hence their inability to rely on the services of the providers. Poor internet connection is one of the common issues in Africa and Ghana, to be specific. This study's empirical result confirms this longstanding situation in the African region and Ghana, to be specific. The results show that internet connection failures are one of the challenges to e-commerce adoption among SMEs. As shown in table 10, doubts about the security and privacy of e-commerce usage are the fifth most prevailing challenge of e-commerce adoption among SMEs in Ghana. It is thus unsurprising that security is found in this study as a significant determinant of e-commerce adoption. Other challenges of e-commerce adoption identified from this study's empirical results include constant customer complaints on difficulties in finding websites, Unsolicited e-mail, lack of knowledge and understanding of e-commerce, and poor advice from user support representatives, and lack of user support.

3.9 Strategies for Successful E-commerce Adoption and Usage among SMEs

The attainment of desired e-commerce benefits is essentially dependent on the strategic approaches to its adoption and implementation. The adoption of e-commerce goes beyond the procurement of IT infrastructures. Thus, this study sought to investigate the strategies that small and medium enterprises could employ for the successful adoption and implementation of e-commerce. To achieve this objective, authorities suggested several strategies were provided as options for respondents to indicate those they use to adopt and implement e-commerce successfully.

Table 11: Strategies for Successful E-commerce Adoption and Usage among SMEs

Item	Mean Rank
Economies of scale and scope in alliance with strategic networks	2.72
The use of advanced technologies for data collection, analysis, and management	3.08
Building consumer trust	3.32
Maintaining unblemished ethical conduct by retail e-commerce firms	2.89
Incorporating protection and privacy policy statement on our electronic platforms	3

Source: Author's Work, 2020

Respondents were expected to rank the listed strategies for successful e-commerce adoption and implementation in order of importance using a scale of 1 to 5, with 1 being the most important and 5 being the least important. The most important strategy was thus expected to record the least mean rank value. The Friedman test was employed in the analysis of the data collected. As explained in the earlier section, the Friedman test is used for one-way repeated measures analysis of variance by rank. The Friedman test technique's mean rank values enabled the researcher to identify the strategies for successful e-commerce adoption and implementation among SMEs in Ghana. Results obtained from the Friedman test on the strategies are presented in table 11. The results of the study, as presented in Table 11 above, shows that the essential strategy used by SMEs in Ghana for successful e-commerce adoption and implementation is the application of economies of scale and scope in alliance with strategic networks, which is one of the strategies put forward by [30] under the cost leadership strategy. It is also observed from the results displayed in table 11 that SMEs also consider the maintenance of unblemished ethical conduct as an essential strategy for a successful e-commerce adoption and implementation. Considering that doubts about the security and privacy of e-commerce usage are a significant concern or challenge, ensuring unblemished ethical conduct by SMEs is a critical strategy to encourage and improve e-commerce adoption and usage. The study results further revealed that using advanced technologies for data collection, analysis, and management is also considered another essential strategy for successful e-commerce adoption and implementation. Other strategies for successful e-commerce adoption identified in this study include incorporating protection and privacy policy statements on electronic platforms and building consumer trust. This finding supports [31] propositions, highlighting the strategic importance of building consumer trust and maintaining unblemished ethical conduct by retail e-commerce firms. The finding of this study also supports the argument of [32], who argued that trust has a relationship with consumers brand identification with an online shop.

4. Conclusion

This study was set out to investigate the development of e-commerce among small and medium enterprises in Ghana. The findings of this study regarding the level of e-commerce adoption among SMEs in Ghana indicate that most SMEs in Ghana have adopted at least one form of e-commerce level. The findings further show that all three e-commerce adoption levels, which consist of non-interactive, interactive, and stabilized e-commerce adoption levels, have been adopted. This indicates that most SMEs in Ghana have gone beyond the adoption of the first and second levels of e-commerce adoption to the final stage. At this point, an organization uses e-commerce to carry out web-based transactions such as the online purchase of goods and services. Thus, it is evident from this finding that e-commerce adoption among SMEs in Ghana has experienced much development over the years and continues to develop. It is, however, observed from the results of the study regarding the levels of e-commerce adoption that the majority of the e-commerce adoption among the SMEs is at the primary level (first and second levels), which does not allow SMEs and their customers to conduct business transactions though others have adopted the final level. Decisions and actions occur based on available data or dominant factors. This study found that adopting and implementing e-commerce among SMEs in Ghana depends on four major significant factors. One of such significant factors is the Relative advantage gained by SMEs when they adopt e-commerce. As expected for the study results, the relative advantage factor was a positive predictor of e-commerce adoption, an indication that the more the perceived benefits or advantages, the greater the likelihood

of adopting e-commerce. Thus, SMEs in Ghana strongly consider the benefits that are likely to emanate from the adoption and implementation of e-commerce in their decision to adopt or otherwise. It is also revealed from the findings of the study that the level of IT knowledge with regards to e-commerce implementation is significant to the adoption of e-commerce among SMEs in Ghana. The study's finding indicates that the adoption and implementation of e-commerce among SMEs in Ghana depends on the availability of senior staff who are knowledgeable and experienced in the IT field. The positive results obtained for this determinant or factor indicate that the more IT knowledgeable and experienced staff are available within an organization, the higher the likelihood of adopting e-commerce with such an organization. Another factor or determinant found in this study as a significant factor of e-commerce adoption and implementation among SMEs in Ghana is the security or perceived risk factor. This finding suggests that SMEs that wish to adopt or are already implementing e-commerce are concerned about the safety of data shared through e-commerce platforms due to the increase in cyber-crime. This is not surprising as this can destroy the reputation of a firm if not well handled. Consumers across the globe value privacy and security of their data and hence would always want to associate with robust systems capable of protecting their data or transactions. Perceived compatibility of e-commerce with existing systems of a firm or organization such as infrastructure, culture, and values is among the four significant factors revealed in this study as significant, influential factors of e-commerce adoption and implementation among SMEs in Ghana. Thus, SMEs in Ghana consider the infrastructure available to them and the ability of such infrastructure to host e-commerce platforms before adopting e-commerce. Certain existing cultures and values do not permit the introduction of new systems contrary to it, hence the need to consider the compatibility of adopting e-commerce with existing business cultures and values before its introduction. Significant challenges hindering e-commerce adoption among SMEs in Ghana, as identified in this study, include high internet traffic, cost of running and maintaining e-commerce operations reliability of service, internet connection failures, and doubts about security and privacy of e-commerce usage. Other challenges of e-commerce revealed by this study include constant customer complaints on difficulties in finding websites, Unsolicited e-mail, lack of knowledge and understanding of e-commerce, Poor advice from user support representatives, and lack of user support. Conclusively, e-commerce adoption among SMEs is essentially dependent on the perceived advantage of e-commerce use, IT knowledge, security/perceived risk, and perceived compatibility of e-commerce with existing systems.

5. Policy Implications/Recommendations

5.1 Theoreticla Implications

Theoretically, this study offers a broader understanding of e-commerce adoption and usage among SMEs regarding adoption levels, factors influencing e-commerce adoption decisions, challenges, and strategies for successful adoption. The empirical assessment of the levels of e-commerce adoption and implementation among SMEs in this study has uncovered the various levels of e-commerce at which SMEs in Ghana are operating. As revealed in this study, Most SMEs in Ghana operate at a basic level of e-commerce, which prevents full-scaled transactions from being completed online. This finding provides the foundation for further research into the causes of most SMEs' inability to launch into the final level of e-commerce adoption, which will enable them to execute full-scaled transactions online. This study's findings on the factors influencing e-commerce adoption

and implementation provide empirical support to the various factors of e-commerce adoption put forward by various authorities, thus giving credence to their ability to influence e-commerce adoption decisions. Furthermore, the use of the binary logit regression and the Friedman test technique in this area of study for the first time sets the grounds for future research to employ these analytical methods in the area of e-commerce.

5.2 Practical Implications

This study's findings provide significant practical implications for owners/managers of SMEs and other significant stakeholders of e-commerce. As revealed by this study, most SMEs in Ghana have not advanced to the third stage/level of e-commerce adoption. This stage, as explained in this study, allows SMEs to execute most of their transactions online. This study's finding could thus influence stakeholders' adoption of the third level, which can help SMEs efficiently and effectively deliver goods and services. This could subsequently influence the fast growth of the national economy as a whole. Findings of this current study indicating the significant determinants of e-commerce adoption among SMEs could also influence government policies towards developing e-commerce among business organizations within the national economy, as businesses form a significant economic aspect. E-commerce is a technological advancement that provides a global marketplace with no geographical boundaries. This research identifies the significant determinants of e-commerce adoption among Ghanaian SMEs, provides practical implications and suggests next steps. As revealed in this study, security/perceived risk is a significant determinant of e-commerce adoption, it is therefore expected that, governments, especially the Ghanaian government, will come up with strategies that enhance the security of online transactions. This will encourage more SMEs, and individuals to get involved in e-commerce activities and consequently expand the market of businesses and economies. The findings of the study also indicates that relative advantage or the perceived benefits of e-commerce adoption is a significant determinant of e-commerce adoption, hence, economies that wish to transform their systems, should promote the education of e-commerce adoption among SMEs ad individuals should be This thesis blends social constructivism with technological, organizational, and environmental determinism. Recognizing the various advantages of e-commerce for companies, this paper presents findings that necessitate concerted efforts from the government, company owners and managers, and technology vendors.

5.3 Recommendations

Based on the findings of this study, it is recommended that stakeholders in the e-commerce field focus on promoting the benefits that SMEs stand to gain upon the adoption of e-commerce to encourage other more SMEs that have not adopted e-commerce yet to adopt it. Considering the contributions of e-commerce to the growth of economies as a whole, managers of economies should consider significant investments in the IT field to build infrastructure and human capacities to support e-commerce adoption. The availability of major IT infrastructures and knowledgeable and skilled human resource has the potential to boost the growth of e-commerce adoption and subsequently contribute immensely to the growth of the economy. Furthermore, stakeholders within the e-commerce fraternity should invest heavily in online transactions' security to boost the confidence of consumers in the use of online platforms. SMEs should consider building systems that accommodate the introduction of e-commerce into the firms. Finally, governments should employ legislative

tools to design a robust regulatory framework to back e-commerce adoption and protect businesses and customers against hacking and fraud.

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