

FACTORS THAT DRIVE INTERNET USAGE AMONG SMALL AND MEDIUM SCALE ENTERPRISES: EVIDENCE FROM GHANA

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ABSTRACT

The internet continues to significantly affect the way business is carried out globally. As businesses of all sizes align information communication technology to its processes to achieve operational excellence while reducing cost, using the internet has become even more critical than ever. This study uses both quantitative and qualitative approaches to assess factors that drive the usage of internet as part of the business operations of small and medium-scale enterprises. The analysis compares internet usage with the use of mobile phones and televisions. From the results, service-related businesses are more likely to use the internet for business operations than other business typologies. However, the length of experience in internet usage is strongly associated with business operators that use the internet. Results also indicated that the small and medium-scale enterprises are gradually adopting more sophisticated internet technologies in business. Although respondents assert to the benefits derived from the use of the internet in business, replacing conventional media with internet services is unlikely. Issues about cost, slow access speed and customer communication preferences are major internet usage challenges. We propose that further studies should adopt extensive statistics financial indices to measure internet usage against perceived outputs and benefits in these enterprises.

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KEYWORDS: Small and Medium-Scale Enterprises, Information and Communication Technology, Internet Adoption, Business Operations

INTRODUCTION

The internet represents one of the most successful examples of sustained investment and commitment to research and development in information infrastructure. A survey conducted in Ghana by Frempong and Essegbey (2006) on the use of information communication technology (ICT) indicates that despite the wide availability of internet service and relatively high literacy rate among the owners of SMEs only a few of them (7%) use the internet for business activities in the Ghanaian economy. The issue that immediately rises is that if it is neither a question of literacy nor the availability of the service, then what other factors drive internet usage patterns in Ghana?

One determinant, well noted in literature is the proliferation of devious individuals who wish to exploit the internet for their own selfish interests. This type of conduct makes sincere users vulnerable to a host of possible attacks that compromise the confidentiality, integrity, and availability of information they exchange through the internet. As a result of such illicit activities, people tend to lose trust on the security of doing business using the internet and thus, forego its huge potential to stimulate business growth.

Findings from Bessen (2000) indicate that the higher the costs associated with adopting innovation, the slower the pace of usage expansion. This suggests that the cost of adoption is an important factor in the adoption and use of the internet for business.

Literature findings of Mohammad and Alam (2009) suggest that small businesses tend to avoid internet usage in their business because it is perceived as complex to use. Literature findings of Poon & Strom (1997) also suggest that the benefits perceived by the small businesses from internet usage are vestigial and hence discourage the adoption of this technology. But do these factors apply within the Ghanaian context?

Although extensive research literature exists on the usage of the internet in supporting competitiveness of small and medium-scale enterprises (SMEs), there is still the need for a deeper understanding of the factors that either promote or inhibit the adoption and usage of this facility by SMEs within specific contexts. The need for this study is therefore for two main reasons. First, most of the empirical research studies available about determinants of Internet usage for business activities are related to larger formal companies. Secondly, identifying the major driving factors of internet usage among SMEs will provide appropriate information to these businesses to make informed choices and consequently promote internet usage as part of their business operations.

The rest of this paper is organized into four main sections. The first section is a review of literature relevant to the study. The research design, sampling procedure and the data collection techniques are described in the second section on data and methodology. Empirical results of the study are presented in the third section. The final section of this paper is a conclusion to the study, which includes recommendations made to the findings from the results.

LITERATURE REVIEW

According to Ion and Andreea (2008), the internet has become a driving force for development and innovation in many countries with millions of businesses connected to it worldwide. This assertion is supported by a study conducted in 2008 which indicates that 68% of large companies in Albania make use of online ordering facilities (Sevrani & Bahiti, 2008). Earlier statistics by Dixon, Thompson, and McAllister (2002) also indicate that 63% of all UK SMEs were connected to the internet in 2001 with 540,000 SMEs trading online. Their findings further indicate that over half (57%) of SMEs in UK attributed broadband to improved profits and two thirds to lowering the cost base.

The internet is also making commercial activities more effective, information more accessible for decision making, and producing more results, faster. A study on Canadian manufacturing establishments shows greater usage of advance ICTs among establishments that recorded higher productivity (Michael & Andrew, 2004). The internet is also known to offer new ways of displaying results, such as real-time financial systems that can be accessed from just about anywhere (Alam & Noor, 2009). Such access to both computer power and business information provides the platform for customers and suppliers to find answers to questions they could only imagine a few years ago. There are several other benefits the internet accrues to the business world (Dixon, Thompson, and McAllister, 2002, Ilavarasan & Levy, 2010, OECD, 2004, Sevrani & Bahiti, 2008). Literature by Ion and Andreea, (2008) categorize these benefits into three; operational tactical and strategic as shown in Appendix A.

Small and Medium Scale Enterprises

Studies on micro, small and medium-scale businesses mainly define SMEs either economically or statistically. The Bolton Committee categorized an enterprise as small if it has a relatively small share in the market place; if it is managed by owners or part owners in a personalized way and not through a medium of a formalized management structure; and if it is independent, in the sense of not forming part of a large enterprise (Bolton, 1971). Statistical definitions of SMEs are based on sector contribution to indices like GDP, employment and export; the dynamic nature of the firm's sector contribution over time; and the position of the firm when applying the statistical definition in a cross-country comparison of

small firms (Ayyagari, Beck & Demirgüç-Kunt, 2005). The European Commission (EC) for instance defines SMEs based on the number of workers employed; businesses with zero to nine (0-9) employees are classified as micro enterprises, those with ten to ninety-nine (10-99) employees as small enterprises; and those with one hundred to four hundred and ninety-nine (100-499) workers as medium enterprises (Ion & Andreea, 2008, Harindranath, Dyerson, & Barnes, 2008). The United Nations Industrial Development Organization (UNIDO) adopts the definition of the EC, but provides different thresholds for developing economies; zero to five (0-4) workers for micro enterprises, five to nineteen (5-19) workers for small businesses and twenty to ninety-nine (20-99) workers for medium-scale enterprises (Yon & Evans, 2011, Mensah, 2004). Studies conducted in developing economies emphasize other socioeconomic characteristics in defining SMEs. These include limited formal education, the lack of technical know-how as well as the inability to acquire skills and modern technology to definition of SMEs (Abor & Quartey, 2010, Antlová, 2009, Frempong & Essegbey, 2006, Katzeff & Abdallah, 2006, Mensah, 2004).

The usage of ICT among SMEs progress from the adoption of basic technology such as the traditional media and fixed lines to more advanced technology such as email, e-commerce, and information processing systems (Servani & Bahiti, 2008). Studies suggest that SMEs which move beyond the use of traditional media and fixed lines, usually adopt personal computers for basic word processing, accounting, and other business practices without internet connectivity. However, SMEs that advance to the usage of the internet are able to use more advanced communications capabilities such as email, file sharing, creating websites, and e-commerce (Frempong & Essegbey, 2006, Servani & Bahiti 2008).

DATA AND METHODOLOGY

A case study approach was employed to examine the research problem within the context of the locations chosen. For this reason there is little assurance on how representative the results of this study would be to all SMEs in Kumasi. Two geographical areas were targeted Ayeduase and Adum. Information about the number of SMEs available at these target areas were received from the Oforikrom sub-metro (for Ayeduase) and the Kumasi Metropolitan Assembly (KMA) (for Adum). The total population figures received corresponded with the SMEs which had registered with these institutional bodies.

Primary data for the study was collected through interviews and observational visits in August 2012. Interactions with each of the respondents under study consisted of a mix of closed-ended and open-ended survey questions. A questionnaire was designed for this purpose with numerical codes assigned to alternative responses where appropriate. This study was not designed to directly examine internet usage effects on revenue, productivity or cost. Instead, the study was limited to the assessment of the characteristics and internet usage behaviors, and linked them to the decision to use internet as part of business operations. For this reason, questions for the interview examined attitudes, opinions and organizational practices rather than financial indices. The close ended questions were dominantly used to receive responses concerning the characteristics of the businesses as well as the attitudes, behaviors and opinions of the respondents towards the use of the Internet. Data on respondent reactions and suggestions were collected using semi-structured, open ended questions.

The questionnaires were either self-administered or interviewer-administered depending on the preference of the respondent. Self-administered questionnaires were physically delivered to and collected from the intended respondent to reduce possibilities of contamination and unknown biases. Also, the reliability of the questions was assessed mainly through the alternative form approach. Other approaches such as the test re-test were used but sparingly to avoid possibilities of irritating a respondent by repeating questions. The targeted groups for the interviews were the managers and owners of the businesses since literature suggests that the decisions of these groups in such establishments invariably have major impacts on the operational behaviors of other employees (Abor & Quartey, 2010).

EMPIRICAL RESULTS

Socio-Demographic Characteristics of Respondents

Statistics on the socio-demographic characteristics of respondents from Ayeduase and Adum are presented in Table 1. Table 1 shows the distribution of the respondents by sex, age grouping, and highest formal educational level, ownership status and business typology within each study area. The percentage proportions for the distributions, which are relative to the total number of respondents within each study area, are also presented. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel.

Table 1: Summary Statistics on Socio-demographic Characteristics

Panel A: Sex distribution				
	Adum (N=306)		Ayeduase (N=27)	
	n	%	n	%
Male	182	59.5	15	55.6
Female	118	38.6	9	33.3
Missing	6	2.0	3	11.1
Panel B: Age Grouping				
	Adum (N=306)		Ayeduase (N=27)	
	n	%	n	%
18-25 yrs	7	2.3	3	11.1
26-35 yrs	68	22.2	14	51.9
36-40 yrs	110	36.0	4	14.8
41-45 yrs	68	22.2	2	7.4
46-55 yrs	43	14.1	1	3.7
56-60 yrs	5	1.6	0	0.0
Above 60 yrs	3	1.0	0	0.0
Missing	2	0.7	3	11.1
Panel C: Highest Educational Level				
	Adum (N=306)		Ayeduase (N=27)	
	n	%	n	%
None	14	4.6	0	0.0
Primary	74	24.2	0	0.0
Secondary	107	35.0	10	37.0
Tertiary	103	33.7	14	51.9
Missing	8	2.6	3	11.1
Panel D: Ownership status				
	Adum (N=306)		Ayeduase (N=27)	
	n	%	n	%
Owner	219	71.6	13	48.2
Manager	78	25.5	9	33.3
Other	6	2.0	2	7.4
Missing	3	1.0	3	11.1
Panel E: Business Type				
	Adum (N=306)		Ayeduase (N=27)	
	n	%	n	%
Manufacturing	23	7.5	0	0.0
Retailing	239	78.1	7	25.9
Service	42	13.7	17	63.0
Missing	2	0.7	3	11.1

Table 1 shows the socio-demographic characteristics of the respondents in this study. Panel A shows the sex distribution of the respondents. Panel B shows the age distribution of respondents in years (yrs). Panel C shows the highest level of education attained by respondents at the time of interview. Panel D shows the ownership status of the respondents in relation to the SMEs they operate. Panel E shows the type of business operated by the respondent. The last row in each panel represents the missing values for that observation. The first column in each panel shows the socio-demographic variables observed. The figures in the columns labeled 'n' for each panel show the observations for each response. The figures in the columns labeled '%' for each panel show the proportions of each observation in percentage. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel.

In Table 1, results from both Ayeduase and Adum indicate that majority (59.5% and 55.6% respectively) of SME operators are males. This suggests that the number of male and female operators of SMEs is fairly equal in both study areas. With regards to age, a majority (51.9%) of the respondents at Ayeduase are within a much younger age group of 26 to 35 years while most of the respondents at Adum are within the 36 to 40 year age group. Very few of the respondents are above the age of 55.

Results from Table 1 further indicate that as high as 88.9% from Ayeduase and 68.7% from Adum have at least secondary level formal education. The difference between those who have attained up to the secondary level and those who have tertiary level education is marginal for both study areas. Apart from the non-responses (11.1%), results from Ayeduase indicate that all respondents have at least secondary level formal education. At Adum however, there are about five percent (4.6%) of the respondents that have no formal educational background. Evidence from the results in Table 1 supports literature findings that most of the operators of SMEs are highly educated (Frempong & Essegbey, 2006).

More than two-thirds (71.6%) of respondents that operate the SMEs at Adum are owner managers shown in panel D of Table 1. This contrasts with results from Ayeduase where there is a fairly balanced distribution between owner managers and others who are employed as managers. However, most of the employed managers have family relations with the actual owners. These findings agree with the findings of Abor and Quartey (2010) who described SMEs as personalised businesses.

Results presented in Table 1 also indicate that over two-thirds (78.1%) of the SMEs are mainly engaged in retailing of products at Adum whilst the dominant business typology at Ayeduase is service (63%). For both study areas however, manufacturing businesses are the least; a few respondents (7.5%) manufacture products at Adum whilst none of the businesses at are engaged in manufacturing.

Following the socio-demographic characteristics of the SMEs studies, we now report statistics on the ICTs used by the SMEs and focus on three (3) ICTs; mobile phones, computers and the internet. This result is presented in Table 2. This result is not limited to the SME operators who use the aforementioned ICTs for business purpose only. In Table 2, Panels A and B show the number of SME operators who use mobile phones and computers respectively.

We also presented results on the knowledge of SME operators about the internet from two perspectives in Table 2; the operator's awareness of the internet which is presented in panel C and the operator's perception about what the internet as shown in panel D.

Panel E indicates the number of SME operators who use the internet whilst Panel F shows those who have adopted the internet in business. We also present the percentage proportions for the distributions relative to the total number of respondents within each study area. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel. In Table 3, the value of X is 306 for Adum and 27 for Ayeduase. The observations in panel D are not exclusive to each variable. This is because multiple responses were allowed from each respondent. The results in Table 2 indicate that a large number of respondents at both study areas (Adum = 95.4%, Ayeduase = 88.9%) use mobile phones. Results in Table 2 further indicate that a large proportion of respondents have heard about the internet (Adum = 97.7%, Ayeduase = 88.9%).

Taking into account the large number of SME operators that know about the internet, we examine the perceptions of SME operators about the internet and the proportion of operators who use the internet though not necessarily in business. Results in Table 2 indicate that majority of the SME operators at Adum describe the internet as a medium for communication. About Fifty-nine percent (59.2%) of the SME operators at Ayeduase however describe the internet a tool for research and learning. Results in

Table 2 also indicate that sixty-three percent (63.0%) of SME operators at Ayeduase use the internet. Although more than fifty percent (52.3%) of the SME operators at Adum use the internet. The number of SME operators who do not use the internet is significantly high (45.8%) at Adum.

Table 2: Summary Statistics on the ICTs used by SMEs and Awareness about the Internet

Panel A: Use of mobile phones in business				
	Adum (N=306)		Ayeduase (N=27)	
	N	%	n	%
Yes	292	95.4	24	88.9
No	11	3.6	0	0.0
Missing	3	1.0	3	11.1
Panel B: Use of Computers in business				
	Adum (N=306)		Ayeduase (N=27)	
	N	%	n	%
Yes	161	52.6	18	66.7
No	139	45.4	6	22.2
Missing	6	2.0	3	11.1
Panel C: Awareness About the Internet				
	Adum (N=306)		Ayeduase (N=27)	
	N	%	n	%
Yes	299	97.7	24	88.9
No	5	1.6	0	0.0
Missing	2	0.7	3	11.1
Panel D: What the Internet is about				
	Adum (N=306)		Ayeduase (N=27)	
	N	%	n	%
Used for communication	270	67.7	2	7.4
Used for business transactions	8	2.6	1	3.7
Used for information search	7	2.3	3	11.1
Getting clients	1	0.3	0	0
Used for learning and research	13	4.3	16	59.2
Used for finding and advertising products.	8	2.6	1	3.7
Used by the youth	4	1.3	0	0
Used for social networking with friends	8	2.6	1	3.7
Used for surfing and downloading	3	1.0	16	59.2
Panel E: General Internet Usage				
	Adum (N=306)		Ayeduase (N=27)	
	N	%	n	%
Yes	140	45.8	17	63.0
No	160	52.3	7	25.9
Missing	6	2.0	3	11.1
Panel F: Adoption of internet in business				
	Adum (N=306)		Ayeduase (N=27)	
	n	%	n	%
Yes	83	27.1	15	55.6
No	217	70.9	9	33.3
Missing	6	2.0	3	11.1

Table 2 shows summary statistics of the ICTs used by the respondents in business. Panels A and B indicate distributions on the use of mobile phones and computers by the SME operators in their business. Panels C and D indicate the awareness level of SMEs about the internet in this study and panel E and F indicate the use and adoption of internet by SMEs in this study. The last row in each panel is the missing values for the observation. The first column in each panel shows the variables observed. The figures in the columns labeled 'n' for each panel show the observations for each response. The figures in the columns labeled '%' for each panel show the proportions of each observation in percentage. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel.

Following findings from literature, it was anticipated that the internet may not be part of the operations of most of the SMEs studied. From the results, the level of adoption of the internet in business is generally low; 29.4%. We then examined the proportion of internet users who have integrated the internet in their business activities. Evidence from the results indicates that 59.3% of 140 operators at Adum and 88.2% of 17 operators at Ayeduase use the internet in business. This suggested

that individuals who used the internet are rapidly gaining understanding of how the internet facilitates in maximizing business benefits

Adoption and Usage of the Internet in Business

Table 3 shows statistics on the extent to which the internet is used by the SMEs in business. All statistics presented in Table 3 are on the ninety-eight (98) SMEs that use internet in business; eighty-three (83) from Adum and fifteen (15) from Ayeduase. Results show the purpose for using the internet in business, the internet services used and the perceived benefits of the services. The challenges the SMEs face in using the internet services and their level of satisfaction are also presented in Table 3. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel. In Table 3 the value of X is 83 for Adum and 15 for Ayeduase. The observations in Table 3 are not exclusive to each variable. This is because multiple responses were allowed from each respondent.

Results presented in Table 3 indicate that all SME operators who use the internet in business apply it as a medium of communication. This usage corresponded with the dominant description of what the internet was perceived to be. Results also indicate high use of the internet to search for new products, buyers or suppliers which contrasts with the low use for online purchasing; 14.5% at Adum and 6.7% at Ayeduase. Following the results that suggest a high use of the internet for communication and search in business, we examine the level of patronage of internet services for communication and search.

Results in Table 3 indicate a high use of email (97.6% at Adum and 100% at Ayeduase), search engines (100% at Adum and 93.3% at Ayeduase) and social networks (97.6% at Adum and 93.3% at Ayeduase). It was also interesting to realize that 98.8% of SME have websites. The functionality of the website was however not examined. The pattern of internet service adoption supports the model of Sevrani, et al (2008) and suggests that SMEs are progressively adopting more sophisticated internet services in business.

We also examine the perceived business benefits the internet contributes to the businesses. Results presented in Table 3 indicate that 80.7% of respondents from Adum increase their customer base. Additionally, 97.6% and 80% of the SMEs at Adum and Ayeduase respectively discover new products. The highest benefit at Ayeduase was an improvement in the quality of products (93.3%). The increase in customer base, discovery of new products and improve in product quality through internet usage substantiate the high use of the internet for searching.

Next, we examine the common challenges respondents face during the use of the internet in their businesses. This is presented in panel D in Table 3. In Table 3, cost and access speed are the main challenges SME operators face in using the internet in business. Other major challenges from both study areas included slow access speed (Adum=89.2%, Ayeduase=93.3%), privacy issues (Adum=32.5%, Ayeduase=40.0%) and too much information on the internet (Adum=22.9%, Ayeduase=46.7%). Notwithstanding the challenges, results indicated that 51.8% of SMEs from Adum and 40% from Ayeduase indicated full satisfaction.

TEST RESULTS

Determinants of the Use of the Internet in Business

Next, we examine four common factors that influence internet adoption; age, education, business type, and experience in using the internet (Taylor, Zhu, Dekkers, & Marshall, 2003). We examine the experience factor in three perspectives; how long the respondent has used the internet; the frequency

of usage; and the time spent per week in using the internet. We use the Pearson’s Chi-square test to determine the strength of association between the aforementioned factors and the decision to use the internet in business. The results are presented in Table 4. A P-value of 0.05 or less indicates a strong relationship.

Table 3: Summary Statistics of Adoption and Usage of the Internet in Business

Panel A: Purpose for using the Internet in Business				
	Adum (N=83)		Ayeduase (N=15)	
	n	%	n	%
Buying/Selling products online	12	14.5	1	6.7
Finding new buyers/suppliers	58	69.9	9	60.0
Researching/searching new products	75	90.4	15	100.0
Communication	83	100.0	15	100.0
Advertising products online	33	39.8	5	33.3
Panel B: Internet services patronized				
	Adum (N=83)		Ayeduase (N=15)	
	n	%	n	%
E – mail	81	97.6	15	100.0
www (world wide web) your own site	82	98.8	14	93.3
Search engine (e.g. Google)	81	97.6	14	93.3
Remote login (Telnet)	35	42.2	2	13.1
File transfer protocol (FTP)	36	43.4	3	20.0
Chatting (instant messaging)	67	80.7	4	26.7
Social networks (e.g. face book)	83	100.0	14	93.3
Panel C: Benefits to business operations				
	Adum (N=83)		Ayeduase (N=15)	
	n	%	n	%
Use of conventional media has decreased	44	53.0	10	66.7
Dependency on the internet has increased	81	97.6	12	80.0
Realization of new products	81	97.6	12	80.0
Improved product quality	75	90.4	14	93.3
Number of customers have increased	67	80.7	8	53.3
Panel D: Challenges of using internet for business				
	Adum (N=83)		Ayeduase (N=15)	
	n	%	n	%
Slow access speed	74	89.2	14	93.3
Difficulty in finding relevant information	9	10.8	5	33.3
Too much information on the internet	19	22.9	7	46.7
Privacy problem	27	32.5	6	40.0
The place I access internet is too far	8	9.6	1	6.7
My client don’t use internet	16	19.3	1	6.7
It’s too expensive	56	67.5	15	100.0
I don’t see results in using it	1	1.2	1	6.7
Panel E: Satisfaction with internet facilities				
	Adum (N=83)		Ayeduase (N=15)	
	n	%	n	%
Fully	43	51.8	6	40.0
Partially	27	32.5	4	26.7
Least satisfied	5	6.0	2	13.3
No comments	8	9.6	3	20.0

Table 3 shows the technologies used by the respondents in this study as well as awareness about the internet. Panel A indicates the categories of businesses operated by SMEs in this study. Panels B and C indicate the types of technologies used by SMEs in this study. Panels D and E indicate the awareness level of SMEs about the internet in this study and panel F and G indicate the use and adoption of internet by SMEs in this study. The last row in each panel is the missing values for the observation. The first column in each panel shows the variables observed. The figures in the columns labeled ‘n’ for each panel show the observations for each response. The figures in the columns labeled ‘%’ for each panel show the proportions of each observation in percentage. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel.

Table 4: Pearson's Chi-square Test on the Determinants of Using the Internet in Business

Common Factors Influencing Internet Adoption		
	Adum	Ayeduae
Age Groupings	<0.001**	0.542**
Highest Education Level	<0.001**	0.056**
Business type	0.001**	0.027**
Length of Exposure	<0.001**	0.002**
Frequency of Use	<0.001**	<0.001**
Time Spent per Week	<0.001**	<0.001**

*This table shows the results of the Pearson's Chi-square test on factors that influence internet adoption and the decision to use in internet in business. The figures in each cell are the P-values from the Pearson's Chi-square test. ***, ** and * indicate significance at 1, 5 and 10 percent levels respectively. The symbol '<0.001' indicates that the actual P-value is less than 0.001.*

Following evidence from literature (Taylor, Zhu, Dekkers, & Marshall, 2003), it was expected that age and education may affect the decision to use internet in business. In Table 4, the P-value for age at Adum is less than 0.001 but as high as 0.542 at Ayeduase. The P-value for education is also less than 0.001 at Adum and 0.056 at Ayeduase.

The P-value for the type of business and the decision to use the internet for business purposes is exactly 0.001 at Adum and 0.027 at Ayeduase. This suggests that the type of business operated influenced the use of internet in the business. This assertion supports findings of Doner (2006).

Results presented in Table 4 indicate that experience in internet usage had a significant association with the decision to make the internet part of business operations. In Table 4, The P-value for the length of experience in using the internet is less than 0.001 at Adum and 0.002 at Ayeduase. The P-value for frequency of use and the amount of time spent in using the internet is less than 0.001 for both study areas.

Evidence from the test indicates that samples from the Adum study area reflect more significance between the common factors and the decision to use the internet in business the samples from Ayeduase. This may be due to the small number of observations at Ayeduase as opposed to the number of observations at Adum

Following the higher significance of the samples from Adum, We develop univariate logical regression models to estimate the Odds Ratio and P-value of each observation for Adum at five percent level of significance. The following regression equation was estimated to identify the odds ratio for the determinants of the decision to use internet in business:

$$\text{Logit}(P_i) = \alpha + \beta(\text{vector of determinants}) \quad (1)$$

The results are presented in Table 5. The first column in each panel in Table 5 shows the variables for the observations that are tested. The figures in the second column of each panel are the Odds Ratios; the possible range of Odds Ratios for the true population of the sample from Adum is in brackets. The third column in each panel shows the P-value. The observations for education against internet use in business are not enough to develop a logit model.

In Table 5, results indicate that the likelihood that the 18-25 years age group of SME operator use internet in business is 85% less for operators 26-35 years, 95% less for those 36-45 years and 99% less for operators 46-55 years. The odds ratio for the true population of those aged 46 – 55 years is between 0.001 and 0.14 at 5% level of significance. This suggests that the younger age groups in both study areas are more active in using the internet in their businesses than the older aged groups.

Results presented in Table 5 indicate that the likelihood for manufacturing SMEs to use internet for businesses 1.15 times more for retail SMEs and 3.27 more for service-related SMEs. If the true population of SMEs at Adum is considered, at a 5% significance level, the Odds Ratio for retail SMEs is between 0.41 and 3.24 with a p-value of 0.787 while the Odds Ratio for service-related SMEs is between 1.02 and 10.45 with a p-value of 0.045. There is therefore more predictable that service related SMEs are more likely to use internet in business than manufacturing or retailing SMEs.

Results presented in Table 5 indicate that SME operators who have used the internet for more than four years are 16.7 times likely to use it in their business activities. This suggests that years of experience in internet usage may have considerable influence on the decision to make the internet part of business operations.

Table 5: Pearson’s Chi-square and Odds Ratio Test on determinants for Adum

Panel A: Age Groupings		
	Odds Ratio	P - value
18 – 25 yrs	1	
26 – 35 yrs	0.15 (0.02 – 1.38)**	0.095**
36 – 40 yrs	0.05 (0.01 – 0.43)**	0.006**
41 – 45 yrs	0.05 (0.01 – 0.46)**	0.008**
46 – 55 yrs	0.01 (0.001 – 0.14)**	<0.001**
Panel B: Business Type		
	Odds Ratio	P - value
Manufacturing	1	
Retailing	1.15 (0.41 – 3.24)**	0.787**
Service	3.27 (1.02 – 10.45)**	0.045**
Panel C: Length of Exposure		
	Odds Ratio	P - value
6 months – 1 yr	1	
1 – 2 yrs	1.67 (0.16 – 17.89)**	0.673**
2 – 4 yrs	2.27 (0.23 – 22.07)**	0.479**
Above 4 yrs	16.75 (1.85 – 151.82)**	0.012**
Panel D: Frequency of Use		
	Odds Ratio	P - value
Daily	1	
2 – 3 Times a week	0.06 (0.02 – 0.13)**	<0.001**
Panel E: Time spent per week		
	Odds Ratio	P - value
Less than 1 hr	1	
2 – 4 hrs	3.24 (0.69 – 15.20)**	0.136**
5 – 6 hrs	1.11 (0.27 – 4.51)**	0.886**
7 – 9 hrs	3.60 (0.71 – 18.25)**	0.122**
10 – 20 hrs	0.60 (0.15 – 2.33)**	0.460**
Over 20 hrs	11.57 (2.99 – 44.75)**	<0.001**

*This table shows logit models that use Odds Ratio and the Pearson’s Chi-square test to determine the significance of association for the observations at Adum. Panel A shows the logit model for age grouping. Panel B shows the logit model for business types. Panels C, D and E show logit models for experience in using internet. The first column in each panel in Table 5 shows the variables for the observations that are tested. The figures in the second column of each panel are the Odds Ratios; the possible range of Odds Ratios for the true population of the sample from Adum is in brackets. The third column in each panel shows the P-value. The observations for education against internet use in business are not enough to develop a logit model. ***, ** and * indicate significance at 1, 5 and 10 percent levels respectively. The symbol '<0.001' indicates that the actual P-value is less than 0.001.*

As presented in Table 5, an Odds Ratio of 11.57 is derived for those who spend over 20 hours of their time on the internet. If the true population of SMEs at Adum is considered, at a confidence interval of 95%, the Odds Ratio for respondents who spend over 20 hours of their time on the internet is between 2.99 and 44.75 with a p-value less than 0.001. The causation however is possibly in reverse; SMEs that

used the internet frequently or spent more time on the internet may be due to the fact that they were using it for business purposes.

Internet – Conventional Media Usage Comparison

We finally compare the use of conventional media namely mobile phones and televisions/radios to the use of internet services in businesses from two perspectives. The first is based on perceived benefits respondents derive from the use of internet services vis-à-vis the use of conventional media. The second perspective is the possibility of replacing conventional communication media with internet technologies. Table 6 shows results from the 98 SME operators who use the internet in business.

Panel A shows results for comparing benefits. Results on whether the internet can replace mobile phones are presented in Panel B. Panel C presents result on the possibility of replacing television or radio with the internet. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel. In Table 6 the value of X is 83 for Adum and 15 for Ayeduase. The observations in panel A are not exclusive to each variable. This is because multiple responses were allowed from each respondent.

Table 6: Comparing Perceptions about Internet Usage to Using Conventional Media in Business

Panel A: Benefit comparison with conventional media		ADUM (N=83)		AYEDUASE (N=15)	
	n	%	n	%	
Time saving	80	96.4	12	80.0	
More information	83	100.0	15	100.0	
Less expensive	29	34.9	1	6.7	
More useful	80	96.4	14	93.3	
More preferred	79	95.2	13	86.7	
Panel B: Internet can replace mobile phones		(ADUM N=83)		(AYEDUASE N=15)	
	n	%	n	%	
Yes	46	55.4	4	26.7	
No	36	43.4	11	73.3	
Missing	1	1.2	0	0.0	
Panel C: Internet can replace television or radio		(ADUM N=83)		(AYEDUASE N=15)	
	n	%	n	%	
Yes	45	54.2	5	33.3	
No	37	44.6	10	66.7	
Missing	1	1.2	0	0.0	

Table 6 shows a comparison of perceptions about conventional media use to the use of the internet in business. Panel A indicates benefits derived from using the internet for business rather than conventional media. Panel B indicates responses on the possibility of replacing mobile phone with the internet in business. Panel C indicates responses on the possibility of replacing television or radio with the internet in business. The first column in each panel shows the responses received. The figures in the columns labeled 'n' for each panel show the observations for each response. The figures in the columns labeled '%' for each panel show the proportions of each observation in percentage. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel.

Out of 83 respondents from Adum, results in Table 6 indicate that the internet is more informative than the conventional media and over two-thirds (96.4%) also suggest the advantage of time saving with the use of the internet. All respondents at Ayeduase also support the benefit of more information. Additionally, more than two-thirds of the respondents from both study areas consider the internet to be more useful (Adum=80, Ayeduase=93.3%) and more preferred (Adum=79, Ayeduase=86.7%).

Findings from the study show that although more than half (55.4%) of the respondents from Adum agreed that internet services could replace mobile phones in business, more than two-thirds (73.3%) of the respondents at Ayeduase thought otherwise (Table 5). As further depicted in Table 5, more than half (54.2%) of the respondents from Adum agreed that internet services could replace the use of televisions and radios in business. However 66.7% of the respondents at Ayeduase did not agree to this assertion.

To deepen insight about the possibility of replacing conventional media with the internet in business, personal quotes made by respondents are taken into account. The common argument that supports the possibility of replacing conventional media is the extensive and diverse functionalities of the internet over mobile phones and television/radio. Supporting quotes from two respondents follow;

“The computer on the internet can do more than the mobile phone especially for us business people” A RESPONDENT AT AYEDUASE

“We always use the technical support which the TV and Radio service can't do for us” A RESPONDENT AT ADUM

Another argument in favour of replacing conventional media points to the relatively lower cost of the internet. Again in the words of two respondents are;

“I almost use facebook and Google trader to contact all my big customers and I find it cost effective and time saving” A MALE RESPONDENT AT ADUM

“It is cheaper compared to television and radio in terms of adverts and orders” A FEMALE RESPONDENT AT ADUM

Other SME operators emphasize the flexibility, convenience and wider coverage achieved in using the internet. Three quotes to support this argument follow;

“I get the chance to see and choose the things I want online through various chats and It may sell ones business farther than conventional media” A RESPONDENT AT ADUM

“Major news is on the internet now, no need to sit down till a particular time before watching news” A RESPONDENT AT ADUM

“The use of internet helps me in getting any information within the country and outside the country anytime and anywhere” A RESPONDENT AT AYEDUASE

Other respondents though support the possibility of replacing conventional media, hold reservations and conditions for their answers. Three quotes to support this argument follow;

“If internet and web hosts improve and become faster it will cut down cost of phone calls” A RESPONDENT FROM ADUM

“If and only if the internet should be a household material like the electricity and is very fast” A RESPONDENT FROM AYEDUASE

“Yes, but provided the internet facilities will be less expensive” A RESPONDENT FROM AYEDUASE

Prominent among the arguments against the possibility of replacing conventional media with the internet is the reason that not all clients use the internet or can be reached via the internet. Other client-related responses are about the preference of the customers in using conventional media to the use of the internet for business. Two quotes that support these arguments follow;

“The mobile phone helps us to keep track of our various clients” A RESPONDENT FROM ADUM

“All our clients use mobile phones and sometimes they don't use their email for contacts” A RESPONDENT FROM ADUM

“Because with the internet chatting thing, you can only do it with people who have access to the net” A RESPONDENT FROM ADUM

The second major argument in opposition to replacing conventional media is the use of mobile phones for emergency situations. A quote from one respondent to suggest this follows;

"I always use the mobile phone to call clients and sometimes order goods and materials in case of emergency" A RESPONDENT FROM AYEDUASE

The third set of predominant argument for conventional media use are about the unreliable nature of internet vis-à-vis conventional media; especially in terms of security and privacy, speed of getting information, clarity of the information and portability. Quotes to suggest this follow;

"Because the television and radio services helps better in our business, and due to privacy problems on the internet" A RESPONDENT FROM ADUM

"Mobile phone is faster in business transactions" A RESPONDENT FROM ADUM

"I trust the media more" A RESPONDENT FROM ADUM

"Internet here is slow, online TV is slow..." A RESPONDENT FROM ADUM

Despite the perceived benefits internet users derived from the use of internet tools, there are strong arguments opposing the possibility totally migrating from the use of mobile phones and the television or radio to the use of the internet in business. The strongest arguments are the advantage mobile phones have in handling emergency situations and the preferences of clients. The comparative cost was however an advantage to internet uses

CONCLUSION

Despite the existence of extensive literature on the usage of the internet in supporting business, there is still the need for a deeper understanding of context specific determinants of the decision to adopt and use the internet in business. This study uses data from 333 small and medium scale enterprises (SMEs) to assess the factors driving internet usage in business among SMEs in Ghana.

Results from this study suggest that there are strong associations between factors such as age, education and usage experience, and the decision of SME operators in Ghana to adopt and use internet in business operations. Results further suggest that service related SMEs are more likely to use the internet for business than retailing or manufacturing related SMEs. Finally, although respondents asserted to the benefits derived from the use of the Internet in business, replacing conventional media with internet services is unlikely.

There are limitations that may compromise how. The sample for this study is relatively and interviewers had to approach respondents that were willing to participate in the research activity and ready to give out information needed. There is therefore little assurance that results in this study characterize is all SMEs in Ghana. Also, the refusal of some participants to answer some of the interview questions account for missing values during the analysis.

Results from this study are based on the perceptions of the respondents rather than financial indices which may have provided more rigorous statistics. Further research may link internet usage to measured outputs and benefits and with extensive statistical indices. Further research may provide detail dynamic of internet usage for each of the three business typologies discussed in this paper. Following evidence from the study that the internet is not expected to replace the use of other conventional communication media, further studies may examine the effect of integrating the internet with devices that support conventional media on the decision to use internet in business.

APPENDIX

Appendix A: Benefits of Information Communication Technology to Business

Operational Benefits	Tactical Benefits	Strategic Benefits
Improved data management	Improved response to changes	Improved growth and success
Improved communication	Improved service quality	Reduced marketing costs
Improved decision-making	Improved teamwork	New technology leadership
Reduced paperwork	Promotes pro-active culture	Improved market share
Reduced labor costs	Improved planning times	Market leadership
Improved ability to exchange data	Improved integration with other business functions	Improved customer/supplier satisfaction
Reduced rework	Reduced time to compile tenders	Improved customer relations
Improved response time to queries	Reduced time to prepare cost plans	Improved competitive advantage
Improved control of cash-flow	Improved effectiveness and efficiency	Improved organizational and process flexibility

This table shows the benefits of information communication technology to businesses. The first column shows a list of operational benefits. The second column in the table shows a list of tactical benefits. The third column in the table shows a list of strategic benefits

Appendix B: Classification of SMEs Studied Under Three Broad Categories

Manufacturing	Retailing	Services
Herbal products	Mobile phones and its accessories	Operating a café
Purified mineral water	Pharmaceutical products	Taking and printing of pictures
Pomade and cosmetic products	Used (second hand) and new clothes	Printing of advertising posters
Manufacturing of farm inputs	Cosmetics and pomades	Computer aided architecture
	Computers and its accessories	Typesetting, binding, lamination, faxing,
	Farm inputs and products	Printing and designing 'T' shirts
	Building materials (paint, cement, plumbing materials)	Repairing computers
	Dealers in ceramic tiles	Unlocking and repairing mobile phones
	Dealers in car batteries	Advertising and graphic designing
	Books and stationery materials	Printing text books
	Cooking utensils, saucepans, knives, etc	Exchanging foreign currencies
	Sports kits, boots, tennis equipment	Provide building services
	Jewellery	Distribution of gas cylinders
	Baby products	Services for parties and other occasions
		Hair dressing and nail fixing
		Plumbing activities or works
		Computer training

This table shows three broad categories of all the types of SMEs studied. The first column shows a list of business types that are manufacturing related. The second column shows a list of business types that are retailing related. The third column shows a list of service-related business types.

Appendix C: Cross Tabulations of the Determinants of Internet Adoption in Business

Panel A: Age Groupings	Adum (N=306)						Ayeduase(N=27)					
	n	Yes (%)	n	No (%)	n	N/A (%)	n	Yes (%)	n	No (%)	n	N/A (%)
18 – 25 yrs	6	85.7	1	14.3	0	0.0	3	100.0	0	0.0	0	0.0
26 – 35 yrs	33	48.5	13	19.1	22	32.4	7	50.0	1	7.1	6	42.9
36 – 40 yrs	25	22.7	33	30.0	52	47.3	3	75.0	0	0.0	1	25.0
41 – 45 yrs	16	23.5	12	17.7	40	58.8	1	50.0	0	0.0	1	0.0
46 – 55 yrs	3	7.0	3	7.0	37	86.0	1	100.0	0	0.0	0	0.0
56 – 60 yrs	0	0.0	0	0.0	5	100.0	0	-	0	-	0	-
Above 60 yrs	0	0.0	0	0.0	3	100.0	0	0.0	0	-	0	-
Missing	0	0.0	0	0.0	2	100.0	0	0.0	0	0.0	3	100.0

Panel B: Highest Education Level	Adum (N=306)						Ayeduase (N=27)					
	n	Yes (%)	n	No (%)	n	N/A (%)	n	No (%)	n	Yes (%)	n	N/A (%)
None	0	0.0	2	14.3	12	85.7	0	-	0	-	0	-
Primary	0	0.0	0	0.0	74	100.0	0	-	0	-	0	-
Secondary	17	15.9	28	26.2	62	57.9	4	40.0	1	10.0	5	50.0
Tertiary	66	64.1	31	30.1	6	5.8	11	78.6	0	0.0	3	21.4
Missing	0	0.0	1	12.5	7	87.5	0	0.0	0	0.0	3	100.0

Panel C: Business type	Adum (N=306)						Ayeduase (N=27)					
	Yes		No		N/A		No		Yes		N/A	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Manufacturing	5	(21.7)	0	0.0	18	78.3	0	-	0	-	0	-
Retailing	58	(24.3)	58	24.3	123	51.5	2	28.6	0	0.0	5	71.4
Service	20	(47.6)	4	9.5	18	42.9	13	76.5	1	5.9	3	17.6
Missing	0	(0.0)	0	0.0	2	100.0	0	0.0	0	0.0	3	100.0

Panel D: Length of Use	Adum (N=306)						Ayeduase (N=27)					
	Yes		No		N/A		No		Yes		N/A	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Less than 6 months	0	-	0	-	0	-	0	-	0	-	0	-
6 months – 1 yr	1	16.7	5	83.3	0	0.0	0	-	0	-	0	-
1 – 2 yrs	5	25.0	15	75.0	0	0.0	1	100.0	0	0.0	0	0.0
2 – 4 yrs	10	31.3	22	68.7	0	0.0	4	100.0	0	0.0	0	0.0
Above 4 yrs	67	77.0	20	23.0	0	0.0	9	81.8	1	9.1	1	9.1
Missing	0	0.0	0	0.0	161	100.0	1	9.1	0	0.0	10	90.9

Table shows cross tabulations between the characteristics of SMEs studied and their decision to use the internet in business. Panel A indicates the association between age grouping and the decision to use internet in business. Panel B indicates the association between education level and the decision to use internet in business. Panel C indicates the association between the type of business and the decision to use internet in business. Panel D indicates length of experience in using internet and the decision to use the internet in business. The last row with the variable labeled 'Missing' in each panel is the missing values for the observation. The figures in the columns labeled 'n' for each panel show the observations for each response. The figures in the columns labeled '%' for each panel show the proportions of each observation in percentage. The total number of respondents (X) for each study area is reported as (N=X) at the header rows for each panel.

REFERENCES

- Abor, J., & Quartey, P. (2010) "Issues in SME Development in Ghana and South Africa:," *International Research Journal of Finance and Economics* (39).
- Alam, S. S., & Noor, K. M. (2009) " ICT Adoption in Small and Medium Enterprises: An Empirical Evidence of Service Sectors in Malaysia," *International Journal of Business and Management, IV* (2)
- Antlová, K. (2009) "Motivation and Barriers of ICT Adoption in Small and Medium-Sized Enterprises." *E+M Ekonomie a Management*. 2. vyd. Liberec: Technická univerzita v Liberci, , roč. 22, č. 2. s. 140 - 154. ISSN 12123609.
- Ayagari, M., Beck, T., & Demirgüç-Kunt, A. (2005) *Small and Medium Enterprises across the Globe: A New Database*. Retrieved June 16, 2012, from The World Bank Website: http://siteresources.worldbank.org/DEC/Resources/84797-1114437274304/SME_globe.pdf
- Bolton, J. E. (1971). "Report of the Committee of Enquiry on small firms" *Bolton Report*. Cmnd. 4811 London: HMSO
- Dixon, T., Thompson, B., & McAllister, P. (2002). *The value of ICT for SMEs in the UK: A Critical Literature Review*. Retrieved June 16, 2012, from The Canadian Centre for Science and Education Website: <http://www.ccsenet.org/journal/index.php/ijbm/article/download/528/509%E2%80%8E>
- Doner, J. (2006) *Internet Use (and Non-Use) among Urban Microenterprises in the Developing World: An Update from India*. India. Retrieved June 19, 2012 from The University of Washington Computer Science and Engineering Website <http://www.cs.washington.edu/education/courses/cse590f/07sp/docs/jdonner.pdf>
- Frempong, G., & Essegbey, G. O. (2006). "SME e-Access and Usage," *Towards an African e-index IV* (1)

Harindranath, G., Dyerson, R., & Barnes, D. (2008). "ICT in Small Firms: Factors Affecting the Adoption and Use of ICT in Southeast England SMEs" *Proceedings of the 2008 European Conference on Information Systems*. Galway, Ireland , 2008

Ilavarasan, V. P., & Levy, M. R. (2010). *ICTs and Urban Microenterprises: Identifying and Maximizing Opportunities for Economic Development*. Retrieved June 19, 2012 from The International Development Research Centre Website: http://www.idrc.ca/uploads/user-S/12802403661ICTs_and_Urban_Microenterprises_104170-001.pdf

Ion, P and Andreea, Z, (2008), Use of ICT in SMEs Management within the Sector of Services, *Annals of Faculty of Economics*, **4**, issue 1, p. 481-487.

Katzeff, C. and Abdallah, L. (2003): "ICT-based learning in knowledge intense micro-sized enterprises" *Proceedings for 2nd International Conference on Multimedia ICT's in Education* Badajoz, Spain.

Mensah, S. (2004) "A review of SME financing schemes in Ghana" *UNIDO Regional Workshop of Financing SMEs*, 15-16 March, Accra

Mohammad, K., & Alam, S. S. (2009). "ICT Adoption in Small and Medium Enterprises: an Empirical Evidence of Service Sectors in Malaysia," *International Journal of Business and Management*, Vol. 4 (No. 2), 112-119.

Taylor, M & Murphy, A (2004) "SMEs and e-business", *Journal of Small Business and Enterprise Development*, Vol. 11 Iss: 3, pp.280 - 289

Poon, S., & Strom, J. (1997). "Small Businesses' Use of the Internet: Some Realities" *Fifth Internet Society Conference*

Sevrani, K., & Bahiti, R. (2008). ICT in Small and Medium-Sized Enterprises: Case of Albania. ICBS

Taylor, W. J., Zhu, G. X., Dekkers, J. & Marshall, S. (2003) *Factors affecting home internet use in Central Queensland*. Retrieved June 19, 2012 from The Information Science Institute Website: <http://proceedings.informingscience.org/IS2003Proceedings/docs/080Taylo.pdf>

Yon, R., & Evans, D. (2011) *The Role of Small and Medium Enterprises in Frontier Capital Markets*. Retrieved June 21, 2012 from The West Point: Network Science Center Website: <http://www.westpoint.edu/nsc/siteassets/sitepages/Publications/SME%20Thought%20Paper1.pdf>.

Bessen, J. (2000) *Adoption Costs and the Rate of Return to Research and Development*. Retrieved May 28, 2012 from The Research on Innovation Website: <http://www.researchoninnovation.org/rdadopt.pdf>

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