

Association for Information Systems AIS Electronic Library (AISeL)

AMCIS 2008 Proceedings

Americas Conference on Information Systems
(AMCIS)

2008

Factors Affecting the Acceptance of Internet and E-Business Technologies in Atlantic Canada's SMEs: A Structural Equation Model

Princely Ifinedo

Cape Breton University, pifinedo@gmail.com

Follow this and additional works at: <http://aisel.aisnet.org/amcis2008>

Recommended Citation

Ifinedo, Princely, "Factors Affecting the Acceptance of Internet and E-Business Technologies in Atlantic Canada's SMEs: A Structural Equation Model" (2008). *AMCIS 2008 Proceedings*. 404.
<http://aisel.aisnet.org/amcis2008/404>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2008 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Factors Affecting the Acceptance of Internet and E-business Technologies in Atlantic Canada's SMEs: A Structural Equation Model

Princely Ifinedo

Cape Breton University, Canada

pifinedo@gmail.com; princely_ifinedo@cbu.ca

ABSTRACT

This study examines the impacts of relevant factors on the acceptance of internet and e-business technologies in Atlantic Canada's SMEs (small- and medium-sized enterprises). A research framework was developed and nine hypotheses formulated to test the relationships. A survey was conducted and a total of 162 valid responses were obtained from business owners, managers, etc. Support was found for five out of the nine hypotheses formulated. The key findings are as follows: The sampled SME's organizational readiness is positively related to their intent to use Internet/business technologies (dependant variable); the two constructs of the technology acceptance model (TAM) were found to be important mediators in the relationship between the management support construct and the dependant variable. Further, no evidence was found to suggest that management support positively influences the intent to use Internet/business technologies among Atlantic Canada's SMEs. The implications of the study's findings for policy making and research were discussed.

Keywords

Internet/e-business technologies, SME, Canada, technology acceptance, organizational readiness, management support.

INTRODUCTION

Information and communication technologies (ICT) are becoming more and more relevant to business organizations with a desire to reduce operational costs, improve management capabilities, gain access to the global market, among others (Sadowski et al., 2002; Mehrtens et al., 2001; Martin and Milway, 2007). Accordingly, management in both large and small enterprises have realized the beneficial impacts of adopting, accepting, and investing in ICT applications including internet and e-business technologies (Wade et al., 2004; Davis and Vladica, 2006; Martin and Milway, 2007). Further, data and reports continue to highlight the importance of such technologies in global e-commerce and e-business engagements, and for national economic developments (Net Impact Study Canada, 2002; 2004; Davis and Vladica, 2006; Martin and Milway, 2007). Specifically, business organizations in Canada (a developed country) are beginning to reap the benefits of employing such technologies in their commercial activities (Net Impact Study Canada 2004; Noce and Peters, 2006; The Daily, 2006). For example, Noce and Peters (2006) note that the value of e-commerce engagements alone in Canada for the year 2004 was \$28 billion, an amount which Statistics Canada (2006) expects to grow in the next decade.

Despite the positive trend being reported for Canada, it has to be mentioned that it has not been clear sailing for the country's businesses – large and small – to adopt and use ICT products, including internet and e-business technologies. In fact, the widely publicized Net Impact Study Canada (2002; 2004) reports showed that small and medium enterprises (SME) lag behind larger businesses on the adoption of internet business solutions (IBS), a term that we accept as being a connotation of internet and e-business technologies. The phrase "internet and e-business technologies" was borrowed from a study conducted by Davis and Vladica (2006) in the same region as this study's, wherein such technologies as email, the Internet, and Website were given as examples. These are related, useful technologies for e-commerce and e-business engagements, and in fact Sadowski et al. (2002, p.76) note that "in establishing a new connection to the Internet [business environment], new users are required to adopt a series of related new technologies."

In this research, our focus will be on the acceptance of such technologies in Canadian SMEs. It is appropriate to pay attention to SMEs, given the universal knowledge of the relevance of such businesses. In brief, SMEs serve as engines for employment generation and national economic growth. According to the Net Impact Study Canada (2002, p.2), "Canadian SMEs deliver 60% of Canada's economic output, generate 80% of national employment and 85% of new jobs." Suffice to say that a broader understanding of the adoption of internet and e-business technologies in Canadian SMEs will benefit both policy makers and researchers. Importantly, the Net Impact Study reports sought to alert Canadian policy makers to two debilitating issues: a) the reluctance of some SMEs in the country to adopt IBS, b) SMEs lag behind larger businesses on the adoption of

internet business solutions. It comes as no surprise, therefore, when the Net Impact Study Canada (2004, p.1.) sounded a note of caution to policy makers and industry leaders in the country by stating that:

“A lukewarm SME response to IBS adoption may weaken any national strategy to bolster Canada’s international competitiveness. The challenge for industry leaders and policy makers is to bring lagging SMEs online and deepen the capabilities of those already online. The cost of inaction is to have this vital sector of the economy stall at current levels of engagement while other nations catch up or increase their lead.”

This call is pertinent to and, to some extent, has motivated this study. It is worth noting that this study is not designed to provide all the answers as to why some Canadian SMEs appear reluctant to adopt internet and e-business technologies. An attempt to address those concerns would be beyond of the scope of this paper. On the other hand, this research aims at shedding light on the nature of relevant factors affecting the acceptance of internet and e-business technologies among SMEs in a particular geographical region of Canada. Larger firms are excluded from this exploratory study because the literature suggests that SMEs differ from larger enterprises on how resource, i.e., financial and knowledge considerations impact ICT adoption and success issues (Thong et al., 1996; Daniel and Grimshaw, 2002; Ifinedo, 2006). Having said that, this research will draw on a theoretical framework in the information system (IS) literature as well as other relevant insights.

BACKGROUND OF THE STUDY

Relevant reports in Canada indicate that the country’s international competitiveness may be negatively impacted if efforts are not directed towards addressing the reticence of some SMEs to adopt relevant internet commerce technologies (Net Impact Study Canada, 2002; 2004). It was also shown that half the number of SMEs in the country has adopted such technologies. How are SMEs defined in Canada, and why are they important for the country? Statistics Canada (2006), generally defines SMEs as firms with fewer than 500 employees. Canadian SMEs provide more jobs to the population than do larger firms, and they contribute significantly to national economic growth (Net Impact Study Canada, 2004). Without a doubt, one of the major concerns for Canadian’s policy makers would be to gain some understanding of the nature of relevant factors that might impact the acceptance of internet and e-business technologies among the country’s SMEs.

To that end, this study was designed to provide insights in this regard. Due to the limited resource available for this study, it would be impossible to sample views on the research’s theme across the country. Rather, a region of the country, i.e., the Maritime or Atlantic region, which apparently lags behind the rest of the country on variety of issues including the use of the Internet for business and commerce (Industry Canada, 2001), is chosen for illustrative purposes. This study will include views of SMEs in the Atlantic region with provinces including Nova Scotia, Newfoundland and Labrador, Prince Edward Island, and New Brunswick. Indeed, larger and more economically endowed regions such as Alberta and British Columbia are among the leaders regarding the use of Internet for business and commerce (The Daily, 2006; Statistics Canada, 2006).

Studies in Canada have discussed themes similar to this. For example, Noce and Peters (2006) examined the barriers to e-commerce adoption in Canadian small-sized business organizations. Davis and Vladica (2006) reported findings on the distribution and use of internet technologies and e-business solutions in one of the provinces in Atlantic Canada. Using Canadian businesses, Wade et al. (2004) studied the net impact of e-commerce on firms’ performances. Others have investigated the business value of ICT products in SMEs (e.g., Davis and Vladica, 2006; Martin and Milway, 2007). None has studied the nature of some relevant factors impacting the adoption internet and e-business technologies among Canadian SMEs as this research intends to do. This work will draw on the technology acceptance model (TAM) as well as the suggestion that other factors including management support and organizational readiness of the adopting organization are relevant in the discourse. Next, well briefly discuss the TAM and the other factors.

The technology acceptance model (TAM) and the other factors

The technology acceptance model (TAM) is regarded as the most widely used theoretical framework for assessing the acceptance of technologies in the literature (see e.g. Legris et al., 2003). The TAM was developed by Davis (1989). Additionally, the TAM has been shown to be relevant for small organizations in particular (Igbaria et al., 1997). The TAM is illustrated in Figure 1 below. It proposes that users’ acceptance of a new IS can be predicted by the users’ perceptions. These perceptions include the ease of use and usefulness of Information technology (IT) (Davis, 1989). The three core constructs in TAM include the following: perceived ease of use, perceived usefulness, and usage. The conception of the TAM shows that perceived usefulness mediates the effect of perceived ease of use on the intention to use, and at the same time directly influences the construct of intention to use (Davis, 1989). The perceived ease of use describes “The degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). Perceived usefulness describes the user’s perceptions of the expected benefits derived from using a particular IS system (Davis, 1989). Intention to use is the dependent variable in TAM.

As with all models, there are limitations in the TAM. In critically reviewing the literature on the use of the TAM in explaining why people accept IS. Researchers, including Igarria et al. (1997) and Legris et al. (2003), argue that the TAM may be too simplistic in predicting intention to use of computer technologies. Accordingly, Igarria et al. (1997) and others modeled factors as "Management support" as an external influence on the TAM. Indeed, the literature has suggested that top management support, commitment, and knowledge of technological innovations are crucially important for the success of IT adoption in small-sized businesses in general (Thong et al., 1996; Igarria et al., 1997), and for the successful acceptance of e-commerce and internet technologies adoption by SMEs in particular (e.g. Mirchandani and Motwani, 2001; Yu, 2006; Al-Qirim, 2007). Likewise, the acceptance of e-commerce and related IT innovations has been known to be strongly influenced by the organization's ability to understand and assimilate the importance of such applications in their operations (Boynton et al., 1994). In particular, Boynton et al. (1994) asserts that the organizational environment in which a business operates is linked to its ability to absorb and use IT-related technologies. In other words, the firm's culture, values, etc. would impact its ability to use new innovations (Grandon and Pearson, 2004). Mirchandani and Motwani (2001), Mehrtens et al. (2001), and Grandon and Pearson (2004), discussing the adoption of internet and e-commerce, referred to this competence as organizational readiness, and they noted strongly the influence of the adoption of e-commerce solutions by SMEs. In brief, organization readiness refers to the knowledge of IT and Internet among organizational members. The research framework with the hypotheses is illustrated in Figure 1. The discussion of the formulation of the hypotheses follows in the next section.

The Research hypotheses

In general, it is accepted that perceived usefulness mediates the effect of perceived ease of use on intention to use (Davis, 1989). Further, the constructs of perceived usefulness and perceived ease of use have been reported to positively impact intention to use of IT (Davis, 1989). Evidence of this is readily available in the relevant literature (Igarria et al. 1997). With respect to e-business and internet technologies, research (Mirchandani and Motwani, 2001; Daniel and Grimshaw, 2002; Grandon and Pearson, 2004) have indicated that when both perceived ease of use and perceived usefulness of internet-enabled applications are high, this usually leads to such technologies being accepted by organizational members. In light of the foregoing discussion, we predict that the acceptance of internet and e-business technologies among SMEs in the Atlantic region of Canada will be positively influenced by perceived ease of use and usefulness of such technologies. We therefore hypothesize that:

- H1:** Perceived ease of use will have a positive effect on perceived usefulness of internet/e-business technologies
- H2:** Perceived usefulness of internet/e-business technologies is positively related to the intent to use such technologies
- H3:** Perceived ease of use of internet/e-business technologies is positively related to the intent to use of such technologies

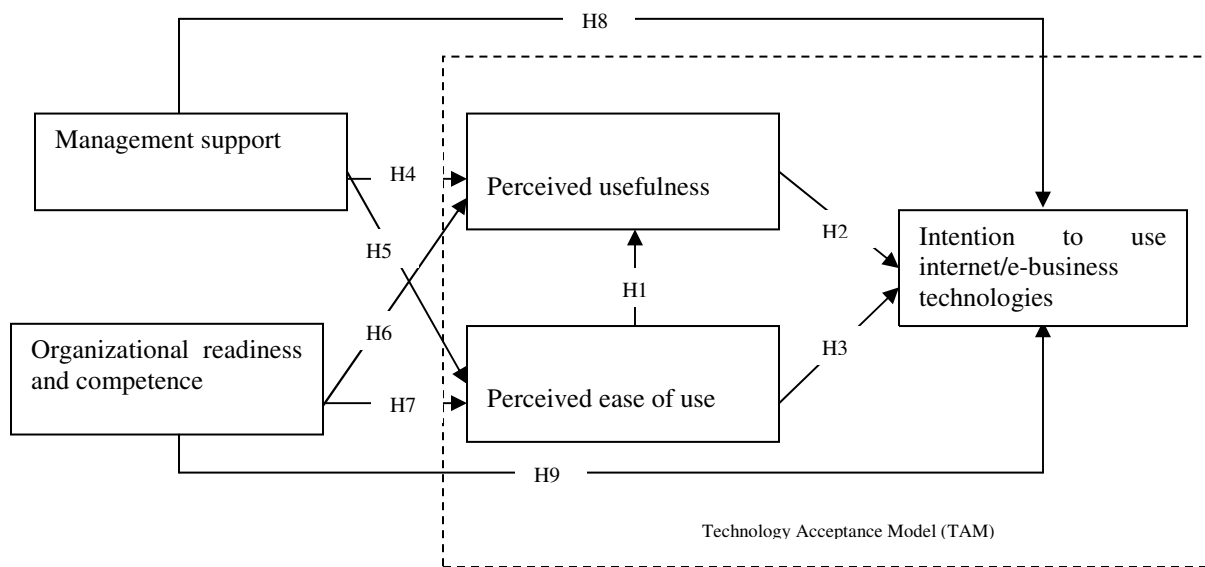


Figure 1. The Research Framework

With respect to the two non-traditional TAM constructs, past research suggests that support from top managers and the readiness of the firm to absorb new ideas tend to augur well for the acceptance of technological innovations (e.g., Iocovou et al., 1995; Igarria et al., 1997; Grandon and Pearson, 2004; Yu, 2006; Al-Qirim, 2007). This is because top managers act as change agents in the adoption process of technological innovations (Thong et al., 1996; Igarria et al., 1997). When top managers in SMEs understand the importance of a computer technology, they tend to play a crucial role in influencing other organizational members as well as committing resources to the adoption of such technologies (Thong et al., 1996; Yu, 2006). Conversely, where management support is low or unavailable, technology acceptance and adoption tend to be placed on the back-burners of organizational issues (e.g. Igarria et al., 1997; Yu, 2006). Likewise, the acceptance of IT-related technologies tend to be more favorable in organizations where the right type of culture and values exist, and where there is a good understanding of the relevance and benefits of the technology in question (Boynton et al., 1994; Grandon and Pearson, 2004; Mirchandani and Motwani, 2001; Al-Qirim, 2007). The foregoing discussion permits us to formulate the set of hypotheses below:

- H4:** Management support will positively influence the perceived usefulness of internet/e-business technologies
- H5:** Management support will positively influence the perceived ease of use of internet/e-business technologies
- H6:** Organizational readiness and competence will positively influence the perceived usefulness of internet/e-business technologies
- H7:** Organizational readiness and competence will positively influence the perceived ease of use of internet/ e-business technologies
- H8:** Organizational readiness and competence will positively influence the intention to use internet/e-business technologies
- H9:** Management support will positively influence the intention to use internet/e-business technologies

RESEARCH METHODOLOGY

Data collection

This study sampled SMEs generated from telephones directories in the four provinces in Atlantic Canada. Two research assistants used a variation of the stratified sampling method -- i.e., every odd number firm was included, and larger firms omitted if it falls on such -- was used to select participating SMEs from across such industries as auto dealership, insurance, manufacturing, retail, and so forth. Organizational informants including owners and presidents were contacted. Each received a packet consisting of a cover letter, a questionnaire, and a self-addressed, stamped envelope. In all, one thousand and seven hundred (1700) questionnaires were mailed in November, 2007 and responses were collected until February, 2008.

Participation in the study was voluntary. Respondents were assured that their individual responses would be treated as confidential. A part of the questionnaire is provided (See Appendix). To ensure data validity and reliability, sixteen (16) knowledgeable individuals (i.e., 4 faculty, 2 SMEs top managers, and 10 college students) completed the initial draft of the questionnaire. Comments received improved the quality of the questionnaire mailed to participants. The majority of the measures used were taken from previously validated sources (e.g. Davis, 1989; Thong et al., 1996; Yu, 2006) and were anchored on a 6-point Likert scale, ranging from Strongly disagree (1) to Strongly agree (6), on which participants were asked to indicate an appropriate choice. An extra column was also provided, which was labeled "Not Applicable" (NA). The measures in the TAM constructs came from Davis (1989) and Igarria et al. (1997). The measures used to operationalize organizational readiness and competence were modified from Mirchandani and Motwani (2001) and Grandon and Pearson (2004). The Appendix shows the measures in the questionnaire, and their reliabilities scores. Clearly, the Cronbach alpha for each dimension is above the 0.70 limit recommended by Nunnally (1978), indicating reasonably high reliability of the research measures and constructs.

A total of 170 responses were received, of which, 162 were considered valid. The excluded eight (8) responses were either not filled out properly or had a high number of missing entries. From the number sent out, 121 questionnaires were returned as undeliverable due to changed or incomplete addresses. Thus, the effective response rate for the survey is 10.3%, which is good for a study of this nature. Table 1 shows the participants' demographics and the characteristics of the responding firms. The participants' average work experience was 13.4 years. The workforce ranged from 1 to 500 employees, with a median of 5 employees.

	Freq.	(%)		Freq.	(%)
Gender			Education		
Male	94	58	Primary school	6	3.7
Female	66	40.7	High school	36	22.2
Missing	2	1.2	College/university	79	48.8
			Post-graduate	31	19.1
			Others	10	6.2
Age			Annual sales revenues (\$)		
Less 20 year	1	1.2	Less \$500,000	75	46.3
21 - 30	23	14.2	\$500,000 - \$ 1 million	32	19.8
31 - 40	27	16.7	\$ 1.1 - \$5 million	35	21.6
41 - 50	55	34	\$ 5.1 - \$ 10 million	7	4.3
51- 60	47	29	\$ 10.1 - \$ 20 million	9	5.6
Above 60 year	8	4.9	\$ 20.1 - \$50 million	4	2.5
			“\$” = Canadian dollar		
Job Titles			Workforce		
Manager, Accountant	43	26.6	Less 50 employees	146	90.1
Owner, Proprietor	64	39.5	51 – 99 employees	10	6.2
Vice President, Director	29	17.9	100 – 500 employees	5	3.1
Others	26	16	Missing	1	0.6
Type of business					
Adverting,, Marketing	12	7.4			
Auto Dealership, Repairs	12	7.4			
Construction	6	3.7			
Design outfits, Decorator	8	4.9			
Education, Driving School	4	2.5			
Hotel, Hospitality	6	3.7			
Insurance, Accounting firms	17	10.5			
Manufacturing	17	10.5			
Retailer, Wholesaler	33	20.4			
Real estate, Legal firms	9	5.6			
Others	38	23.4			

Table 1. Demographic Information Of The Sample (n = 162)

DATA ANALYSIS AND RESULTS

A structural equation modeling (SEM) technique i.e., PLS was used to examine the relationships among the constructs. There are two main approaches: PLS (Partial Least Squares) and covariance-based SEM. The PLS approach was chosen for its capability in accommodating small-sized samples (Chin, 1998). Furthermore, PLS recognizes two components of a causal

model: the measurement model and the structural model. The measurement model consisted of relationships among the factors of interest (the observed variables) and the measures underlying each construct. PLS demonstrates the construct validity of the research instrument (i.e. how well the instrument measures what it purports to measure). The two main dimensions are the convergent validity and the discriminant validity. The convergent validity (also known as the composite reliability) assesses the extent to which items on a scale are theoretically related. On the other hand, the structural model provides information on how well the hypothesized relationships predict the theoretical model. The R² indicates the percentage of a construct's variance in the model, while the path coefficients (β) indicate the strengths of relationships among constructs (Chin, 1998).

Assessing the structural model

The paths' coefficients (β) and the R² were generated by PLS Graph 3.0 and are shown in Figure 3. The R² is 0.36 which suggests that the contingency factors explained 36 of the variance in the intent to use internet/e-business technologies construct. Indeed, the R² of 0.36 is adequate for the study, indicating that the results in general are supportive of the research model. Chin (1998) notes that both the β and the R² are sufficient for analysis, and β values between 0.20 and 0.30 are adequate for meaningful interpretations.

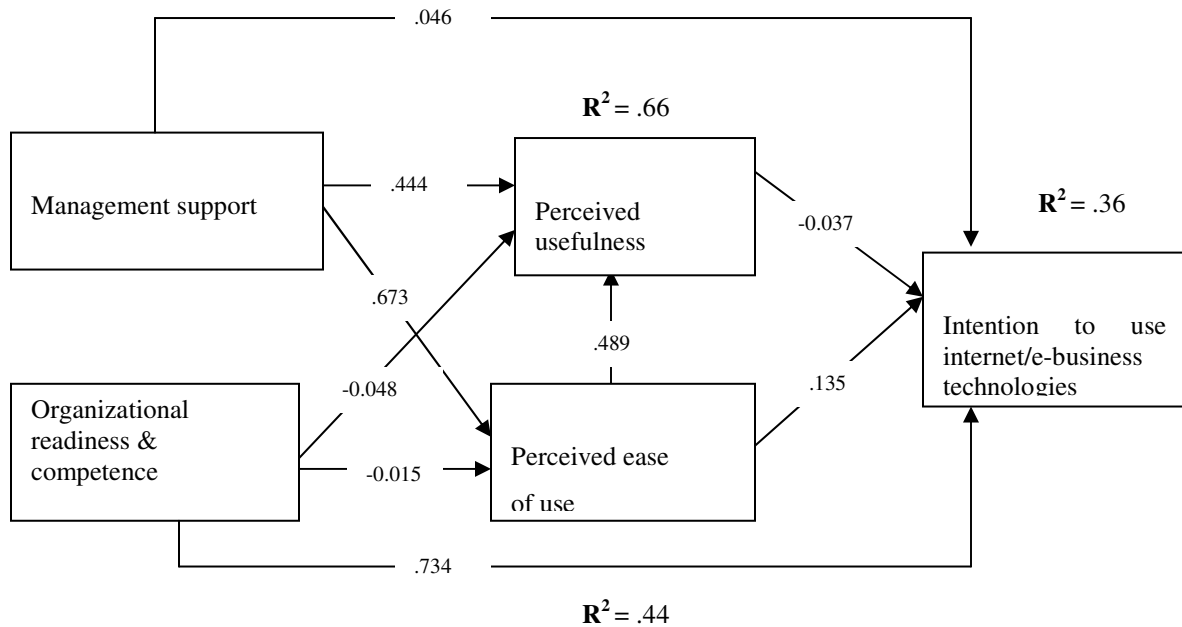


Figure 2. The PLS Graph 3.0 results for the research framework

Assessing the measurement model

PLS Graph 3.0 computed the composite reliability (convergent validity) of each construct and also showed the item loadings (Appendix). Chin (1998) notes that item loadings and composite reliabilities greater than 0.7 are considered adequate. In assessing the discriminant validity, the square root of the average variance extracted (AVE) for each construct, which provides a measure of the variance shared between a construct and its indicators, is checked. Chin (1998) recommend AVE values of at least 0.50 and that the square root of AVE should be larger than off-diagonal elements. Table 2 presents the inter-correlations among the constructs, AVE and the square root of AVE. The research's measures indicate that the constructs are distinct and unidimensional.

	AVE	1	2	3	4	5
1: Management support	0.511	0.715				

2: Organizational readiness and competence	0.531	0.636	0.729			
3: Perceived usefulness	0.685	0.727	0.591	0.828		
4: Perceived ease of use	0.559	0.660	0.548	0.756	0.748	
5: Intent to use internet/e-business technologies	0.765	0.722	0.824	0.533	0.540	0.877

Table 2. The Correlations Among the Constructs And The AVE

FINDINGS AND DISCUSSIONS

Table 3 provides a summary of the results. The data strongly supports four of the nine (9) hypotheses (i.e., H1, H4, H5, and H9) and moderately supports one: H3. The results, however, do not support the other four hypotheses (H2, H6, H7, and H8). Next, we discuss the set of supported hypotheses, which is then followed by discussions of the unsupported ones.

Hypothesis	Path coefficient (β)	t-Value for the path	Result
Perceived ease of use \rightarrow Perceived usefulness (H1)	0.489	1.8643*	Supported
Perceived usefulness \rightarrow Intention to use internet/e-business technologies (H2)	-0.037	0.1423	Not Supported
Perceived ease of use \rightarrow Intention to use of internet/e-business technologies (H3)	0.135	1.0179	Moderately Supported
Management support \rightarrow Perceived usefulness of internet/e-business technologies (H4)	0.444	1.8951*	Supported
Management support \rightarrow Perceived ease of use of internet/e-business technologies (H5)	0.673	5.0135**	Supported
Organizational readiness \rightarrow Perceived usefulness of internet/e-business technologies (H6)	-0.048	0.2415	Not Supported
Organizational readiness \rightarrow Perceived ease of use of internet/e-business technologies (H7)	-0.015	0.0791	Not Supported
Management support \rightarrow Intention to use internet/e-business technologies (H8)	0.046	0.2642	Not Supported
Organizational readiness \rightarrow Intention to use internet/e-business technologies (H9)	0.734	4.9620**	Supported

* significant at $p < 0.01$, ** significant at $p < 0.001$ (two-tailed)

Table 3. Summary Of The Results

According to hypothesis H1, perceived ease of use will have a positive effect on perceived usefulness of internet/e-business technologies. This prediction suggests that a higher level of the usefulness of internet/e-business technologies would be brought about when SMEs perceived such technologies were not difficult to use. This seems to be the viewpoint of the sampled SMEs in this study. Hypothesis H2 stated that perceived ease of use of internet/e-business technologies is positively related to the intent to use of such technologies. This hypothesis is moderately supported by the data. As Legris et al. (2003) noted in their study, it is not uncommon for studies using the TAM to produce results that are not totally clear or inconsistent. Suffice it to say that among the sampled SMEs in the Atlantic region of Canada, the data suggests that the intent to use of internet/e-business technologies is higher when firms perceive such applications as not being difficult to use.

Hypothesis H2 stated that management support will positively influence the perceived usefulness of internet/e-business technologies. The data analysis strongly supports this prediction. The result could be interpreted as meaning that the intention to use internet technologies in an SME is higher when the management of such an enterprise has an understanding of the

benefits and impacts of such technologies, and then are able to provide the necessary support for the entrenchment of such applications in its organization. Other studies investigating the diffusion of ICT among SMEs in Canada have presented a finding similar to this study's (e.g., Noce and Peters, 2006; Martin and Milway, 2007). Similarly, studies from other regions of the world have offered results consistent with the foregoing (e.g., Mirchandani and Motwani, 2001; Yu, 2006; Al-Qirim, 2007). The data analysis strongly supported hypothesis H9. The result shows that a positive relationship organizational readiness and the intent to use internet and e-business technologies exist. That is, the acceptance of ICT tends to be more favorable in SMEs with a good understanding of the relevance and benefits of the technology being considered (Boynton et al., 1994; Grandon and Pearson, 2004). To some extent, the result here corroborates the findings on the adoption of ICT products in Canada that researchers in the country, including Martin and Milway (2007), have made public. They noted that one of the biggest problems facing the growth of ICT use among SMEs is a lack of organizational readiness, as well as poor levels of information awareness of the benefits and impacts of relevant technologies among owners and employees of such businesses. A plausible explanation for the lack of support for the remaining hypotheses might be related to the study's design, the diversity in the industry sampled firms, among others. With regard to hypothesis H2, which is related to the TAM core, studies have shown that it may not be out of place to have dissenting results (Legris et al., 2003). The direct link between management support and the dependent construct is unsupported, perhaps as result of the foregoing insights.

CONCLUSION

The objective of this study was to provide empirical information on the nature of some relevant factors affecting the intent to use internet/e-business technologies by SMEs based in Atlantic Canada. The research study presents both practical and academic implications. In the context of the research setting in particular and for the country in general, the results may suggest that SMEs would be inclined to adopt internet/e-business technologies and related ICT solutions if they perceived such applications to be easy to use. The implication of this is that external agents, including suppliers and vendors of such e-business technologies, have to emphasize the ease of use of such technologies rather than merely underscore their usefulness. This viewpoint is consistent with that espoused by local researchers (Martin and Milway, 2007) suggesting that the supply side (vendors of such application) could do more for the growth of internet/e-business solution among SMEs in the country if these providers paid more attention to the wares that they offer SMEs in the country. It could be argued that less complex products and appropriate education would go a long way here. Interestingly, the relationship between the management support construct and the intention to use internet/e-business technologies for sampled SMEs is not supported.

However, the data analysis indicated that when management provide necessary support, interest, and have a clear vision as to use of such applications, the perceived usefulness and ease of use of such technologies tend to be high. (The two core constructs of the TAM act as mediators in the relationships between the management support variable and the dependant construct). This would suggest that for the use of internet business solutions to grow in the Atlantic region and perhaps in other regions of the country, the management of small businesses would have to acquire attitudes supportive of emerging ICT innovations. In the same vein, SME's management could benefit from education designed to accentuate the impacts of such technological innovations in their operations. Needless to say, the apparent reluctance in adopting IBS reported in the Net Impact Study Canada (2004) might have stemmed from a lack of proper education as well as negative attitudes among decision makers in SMEs regarding the impact of internet technologies on their businesses. Feedback from one owner of an SME reads, "My business is very small and I keep quite busy with word of mouth and the yellow pages." This might be indicative that the right kind of information may not be available to small businesses owners. In order for small businesses in the Atlantic region (and for Canada as a whole) to change the unimpressive statistics noted in the opening section of this paper, owners need to be made aware of the benefits of using e-business solutions. Organizational readiness and competence with respect to knowledge about ICT benefits lead invariably to higher levels of need to use internet/e-business technologies. Other local authors (Martin and Milway, 2007) seem to echo this sentiment.

The academic community also benefits from this research as well. A study of this nature expands the discussion on factors affecting the use of internet/e-business technologies in a relatively poor part of a developed country, Canada. Results from this study may be pertinent to theory development in global IT management as it relates to the adoption of internet business solutions. In general, the study's results lend support to some prior studies in the literature. For example, the importance of management support and organizational readiness were found to be vitally important in the adoption of internet and e-business technologies by other researchers (Mirchandani and Motwani, 2001; Mehrtens et al., 2003; Yu, 2006; Al-Qirim, 2007). Evidence from this work affirms this viewpoint. Most importantly, this work showed that the amount of variation explained by the TAM model can be improved upon significantly by the inclusion of relevant factors. Igbaria et al. (1997) and others have made assertion in this regard. There are inherent limitations in this study. It is exploratory and the sample selected may not have been random. Personal bias may have been an issue, as only the views of a single respondent were used per firm. The measures for some of the constructs could be improved. This study presents the viewpoints of SMEs in

Atlantic Canada; it is difficult to say whether the findings can be replicated in other regions of the country. The research did not control for the types of internet/e-business technologies in use by the SMEs. The study lumped together the various internet/e-business technologies such as email, website ownership, internet, and so forth. It is possible that by not distinguishing between technologies in the study, the findings might have been amplified or downplayed.

Future studies examining a similar theme could incorporate the impact of relevant inter- and intra-organizational factors such as market pressures and government support. Also, this present study could be replicated in other Canadian regions. When results from such endeavors begin to emerge, will we be able understand why Canadian businesses, especially smaller ones, appear to lag behind in accepting e-business. Additionally, studies are needed to affirm or reject the findings in this study. E-business technologies' acceptance in both large and SMEs could be compared. Lastly, better insights and easily verifiable results could emerge if a single internet/e-business technology were used for a given study. This would ensure that confounding effects emanating from the use of diversified technologies would be controlled. Future research should take note of this detail.

ACKNOWLEDGMENTS

Funding for this research study is provided by RP grant (#8241) of Cape Breton University (CBU), Canada.

REFERENCES

1. Al-Qirim, N. (2007). An empirical investigation of a usage model of e-commerce technologies in small businesses in New Zealand: theory extension and implications, *IJEB*, 5, 1, 42-64.
2. Boynton, A., Zmud, R., and Jacobs, G. (1994). The influence of IT in large organizations, *MIS Quarterly*, 18, 3, 299-320.
3. Chin, W. (1998). Issues and opinion on structural equation modeling, *MIS Quarterly*, 22, 1, vii-xvi.
4. Daniel, E. M. and Grimshaw, D. J. (2002). An exploratory comparisons of e-commerce adoption in large and small enterprise, *JIT*, 17, 3, 33-147.
5. Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13, 3, 319-339.
6. Davis, C. H. and Vladica, F. (2006). Use of internet technologies and e-business solutions: A structural model of sources of business value among Canadian micro-enterprises, *Proceedings of the 39th Annual HICSS Conf.* Hawaii.
7. Grandon, E. E. and Pearson, J. (2004). Electronic commerce adoption: an empirical study of small and medium US businesses, *Information and Management*, 42, 1, 197-216.
8. Igarria, M., Zinatelli, N., Cragg, P., & Cavaye, A. L. M. (1997). Personal computing acceptance factors in small firms: A structural equation model, *MIS Quarterly*, 21, 3, pp. 279-305.
9. Ifinedo, P. (2006). Key information systems management issues in Estonia for the 2000s and a Comparative Analysis, *JGITM*, 9, 2, 22- 44.
10. Industry Canada (2001). Micro-enterprises survey 2000: A progress report small business policy <http://www.ic.gc.ca/epic/site/sbrp-rppe.nsf/en/rd01992e.html>.
11. Legris, P. Ingham, J. and Collette, P. (2003). Why do people use information technology?: A critical review of the technology acceptance model, *Information and Management*, 40, 3, 191-204.
12. Martin, R. L. and Milway, J. B. (2007). Enhancing the productivity of small and medium enterprises through the greater adoption of information and communication technology, Information and Communication Technology Council Report. <http://www.ictc-ctic.ca/en/>.
13. Mehrrens, J., Cragg, P. B., Mills, A. M. (2001). A model of Internet adoption by SMEs, *Information and Management*, 39, 3, 165-176.
14. Mirchandani, A. A. and Motwani, J. (2001). Understanding small business electronic adoption: An empirical analysis, *JCIS*, 41, 3, 70-73.
15. Net Impact Study Canada (2002). The SME Experience - A Preliminary Report - November 2002 - Canadian e-Business Initiative. [http://www.cebi.ca/epic/site/ecic-ceac.nsf/vwapj/NI_SME-e.pdf/\\$file/NI_SME-e.pdf](http://www.cebi.ca/epic/site/ecic-ceac.nsf/vwapj/NI_SME-e.pdf/$file/NI_SME-e.pdf).
16. Net Impact Canada IV (2004). Strategies for Increasing SME Engagement in the e-Economy. (Net Impact IV). [http://www.cebi.ca/epic/site/ecic-ceac.nsf/vwapj/NI4-e.pdf/\\$file/NI4-e.pdf](http://www.cebi.ca/epic/site/ecic-ceac.nsf/vwapj/NI4-e.pdf/$file/NI4-e.pdf).

17. Noce, A. and Peters, C. (2006). Barriers to electronic commerce in Canada: A size of firm and industry analysis (III-C), Industry Canada electronic commerce branch, Ottawa, Canada.
18. Nunnally, J.C. (1978). Psychometric theory, McGraw-Hill, New York, NY
19. Thong, J.Y.L., Yap, C.S., and Raman, K.S (1996). Top management support, external expertise and information systems implementation in small business, *ISR*, 7, 2, 248-267.
20. The Daily (2006). E-commerce: Shopping on the Internet. <http://www.statcan.ca/Daily/English/061101/d061101a.htm>
21. Sadowski, B.M., Maitland, C. and van Dongen, J. (2002). Strategic use of the Internet by small- ad medium-sized companies: an exploratory study, *Information and Economic Policy*, 14, 1, 75-93.
22. Statistics Canada (2006). Survey of Electronic Commerce and Technology. <http://e-com.ic.gc.ca/epic/site/ecic-ceac.nsf/en/gv00152e.html>.
23. Wade, M., Johnston, D. and McClean, R. (2004). Exploring the net impact of internet business solution adoption on SME performance, *IJEB*, 2, 4, 336-350.
24. Yu, C-S (2006). Influences on Taiwanese SME E-Marketplace adoption decisions, *JGITM*, 9, 2, 5-21.

APPENDIX. THE QUESTIONNAIRE MEASURES AND THE RELIABILITY SCORES

	Item loading	Cronbach alpha	Composite reliability
Ease of Use			
<i>Eou1</i> : The use of internet/e-business technologies would be clear and understandable for us	0.7590	0.940	0.832
<i>Eou2</i> : Learning to use internet/e-business technologies would be easy for our employees	0.8874		
<i>Eou3</i> : Overall, internet/e-business technologies would be easy to use in our organization	0.7503		
<i>Eou4</i> : It would be easy to become skilful at using internet/e-business technologies in our firm.	0.7543		
Perceived Usefulness			
<i>PUS1</i> : Using internet/e-business technologies would make work easier for our employees/managers.	0.8558	0.937	0.913
<i>PUS2</i> : Using internet/e-business technologies would increase employees' & managers' productivity.	0.7050		
<i>PUS3</i> : Using internet/e-business technologies would increase the performance of our employees.	0.8893		
<i>PUS4</i> : Our employees and managers would find internet/e-business technologies useful in their jobs.	0.9020		
<i>PUS5</i> : Using internet/e-business technologies would provide information for strategic decisions.	0.9127		
Management Support			
<i>MS1</i> : Management is interested in the use of internet/e-business technologies in our operations.	0.6667	0.943	0.794
<i>MS2</i> : Management is supportive of the use of internet/e-business technologies in our operations.	0.7343		
<i>MS3</i> : Our business has a clear vision regarding the use of internet/e-business technologies.	0.6772		
<i>MS4</i> : Management communicates the need for internet/e-business technologies usage in the firm.	0.8150		
Organizational Readiness and Competence			

<i>OCR1</i> : Our firm knows how information technology (IT) can be used to support our operations.	0.6489	0.911	0.814
<i>OCR2</i> : Our firm has a good understanding of how internet/e-business technologies can be used in our business.	0.8625		
<i>OCR3</i> : We have the necessary technical, managerial and other skills to implement internet/e-business technologies.	0.7148		
<i>OCR4</i> : Our business values and norms would not prevent us from adopting internet/e-business technologies in our operations.	0.7658		
Intention to Adopt Internet/e-business Technologies			
<i>IntAD1</i> : I am certain my firm/organization will adopt Internet/e-business technologies someday.	0.8954	0.943	0.907
<i>IntAD2</i> : My firm is committed to adopting Internet/e-business technologies in the future.	0.8481		
<i>IntAD3</i> : There is likelihood that my firm will adopt Internet/e-business technologies in the future.	0.8793		

To what extent do you agree or disagree with the following statements. (Not Applicable (N/A) = 0,

1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = somewhat agree, 5 = Agree, 6 = Strongly agree)