

**SMALLER MANUFACTURING ENTERPRISES
AND THE INTERNET IMPERATIVE:
A CASE OF A LOCAL CLUSTER**

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ABSTRACT

The purpose of this paper is to examine whether or not there is a difference between smaller manufacturing enterprises (SMEs) in a single homogenous business environment that maintain active websites and those that do not. This paper also examines the content of websites maintained by SMEs. This study uses a random sample of 150 SMEs drawn from a commercially available directory. The preliminary findings of this exploratory study suggest that SMEs are not only reluctant to join in e-business transactions and maintain a viable website, but also a small percentage of them include an international or global component in their websites. These findings further suggest that policy concerns related to promotion, stimulation, and development of global activities among SMEs perhaps need to be reexamined.

Key Words:

Small and Medium-Sized Enterprises

Internet

E-commerce

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INTRODUCTION

Development and use of a broad customer base in the global market place today is often accomplished through participation in business-to-business (industrial) marketing networks. Although this concept is relatively well understood and accepted by large globally oriented enterprises, smaller manufacturing enterprises (SMEs) tend to be less willing to employ it. In the age of information technology, one way of seeking and initiating participation in business-to-business marketing networks is by placing a web page on the Internet.

A cursory examination of Internet web pages of larger enterprises suggests that sales or marketing appears to be the corporate function that most frequently introduces a web page on the Internet. Since SMEs tend to be more sales oriented, it is perceived that sales would most likely be responsible for web pages among SMEs and would very likely also reflect the need for business-to-business network participation and, therefore, the need for a global focus.

The purpose of this paper is to examine whether or not there is a difference between SMEs in a single homogenous business environment that maintain active websites and are participating in some way in business-to-business marketing networks in the global setting, and those that do not. In addition, this study also examines the content of websites maintained by SMEs to determine the extent of their global involvement.

This is an exploratory study that examines SMEs in a single homogeneous business environment since public policy regarding SMEs tends to be locally, rather than nationally, initiated and implemented. The methodology for the study is designed in such a way so that, in the future, the study can be replicated in several different business environments (countries).

BACKGROUND AND CONTEXT

In most major economic systems SMEs symbolize the foundation for economic stability and significant economic growth. Most countries encourage SMEs to grow, and frequently actively support those SMEs that are not only participating in business-to-business marketing networks, but are globally active. The recent developments in information technology and, more specifically, the increased use of websites among SMEs in business-to-business marketing, enable many SMEs to be more active in both business-to-business marketing networks and marketing their products and services globally rather than locally.

E-business or Internet marketing must be a part of the present and the future of any business enterprise. Today, both the popular and professional literature available on this topic tend to predict that, in the information technology age, the use of the Internet is imperative for their survival, especially for SMEs. Not only is this a new paradigm for how business today is conducted globally, but it is generating a new and more vibrant global customer base for SMEs.¹

Although the above concepts regarding SMEs' business-to-business marketing network participation, and their Internet practices, have been generally accepted by SMEs' managers, these concepts have not been systematically examined by academic researchers. Many of these concepts are, however, discussed occasionally in management training sessions. There is a need to examine these concepts from a broader theoretical perspective.

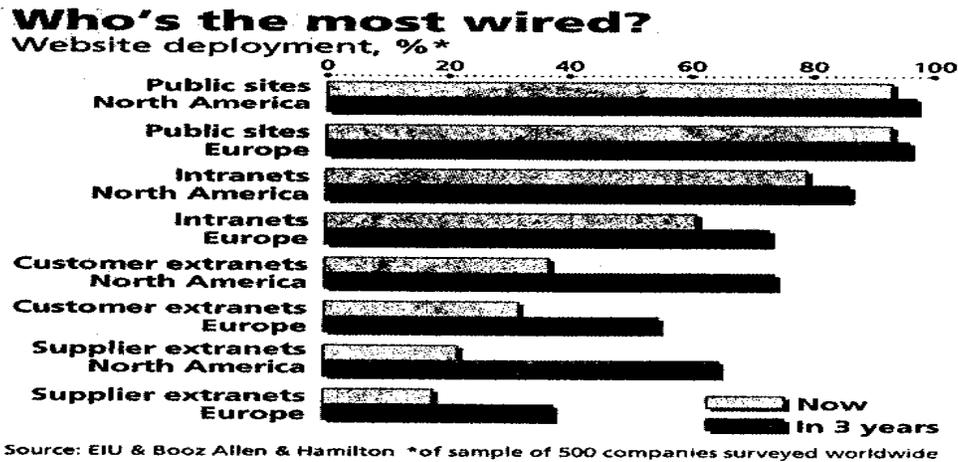
For example, these concepts suggest that the placement of a web page on the Internet tends to force a relatively locally oriented SME into the global e-business environment. From an external perspective, however, the exposure of SMEs to the global e-business environment does not necessarily represent a strong proactive position towards, or in, some virtual business-to-business network membership or participation in the global market by SMEs. For many SMEs,

it seems that posting their web page on the Internet is tantamount to network membership and participation. This confidence among SMEs managers is generally a result of the increased number of potential sales inquiries and, in some cases, orders from nontraditional sales areas or even markets. Yet, some SMEs view their Internet exposure as part of their competitive reality or even as a necessity.²

This study has two fundamental objectives: (1) to develop a research methodology suitable for studying SMEs and their Internet involvement and (2) to apply the research methodology to study the content of SMEs web pages. If a suitable research methodology could be developed to study SMEs in a given external business environment and used in comparative studies across national external business environments, data could be collected that would enable researchers to compare SMEs Internet participation in a number of countries. The results of such studies would also be useful in making comparisons about memberships and virtual network participation on an international level. The content analysis that is a part of the proposed research methodology would indicate the level of exposure on their web pages that SMEs in various countries give to international or global issues in their operations.

Available literature, both popular and professional, regarding the involvement of SMEs with the Internet, e-business, or more specifically, the use of websites, is very limited. *The Economist* presented one of the most credible studies concerning these issues in 1999.³ It reported a worldwide survey of 500 large companies conducted by Economic Intelligence Unit & Booz Allen & Hamilton. The study suggests that, in terms of public websites, both North America and Europe are about even (See Figure 1). In three years (2002), according to the study, North America and Europe will still remain about even. However, North America leads Europe in the number of Intranets by approximately 20 percent and will continue to lead over the

FIGURE 1

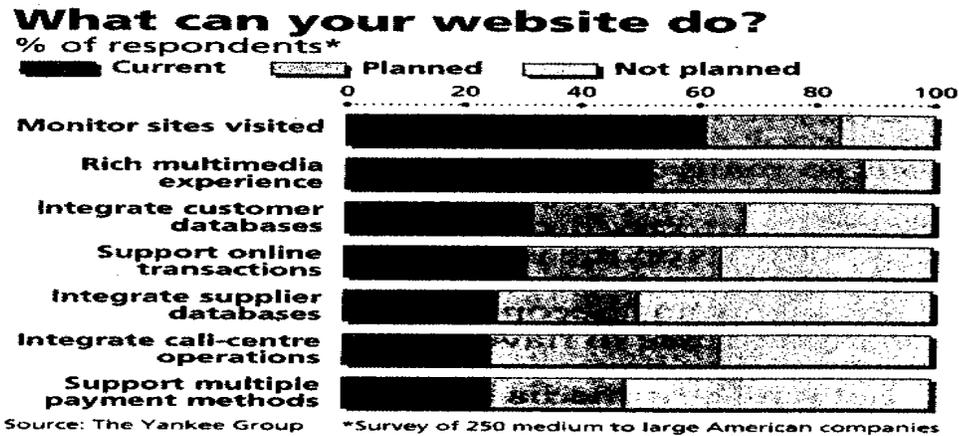


next three years (until 2002). In terms of customer extranets, both North America and Europe are about even, however, by 2002 North America will lead Europe by about 22 percent. In the case of supplier extranets, the future is more dramatic. By 2002 suppliers' extranets in North America will exceed Europe by over 28 percent.

Another study of 250 medium to large American companies by Yankee Group raised the specific issue of what a website can do for e-business. The study suggests (See Figure 2) that currently enterprises can monitor who is actually visiting their websites, and over 60 percent of the respondents to their study have done so. Websites can present a rich multimedia environment and highlight the enterprise as a dynamic one in terms of information technology, as over 50 percent of respondents to the study agreed. Websites can also integrate customer databases for better sales and marketing operations. They can support online transactions, integrate supplier databases, integrate call-center operations, and support multiple payment methods.⁴

The study also examined what the respondents are planning. It appears that: (1) richer multimedia experiences, (2) integrated customer databases, and (3) integrated call-center

FIGURE 2

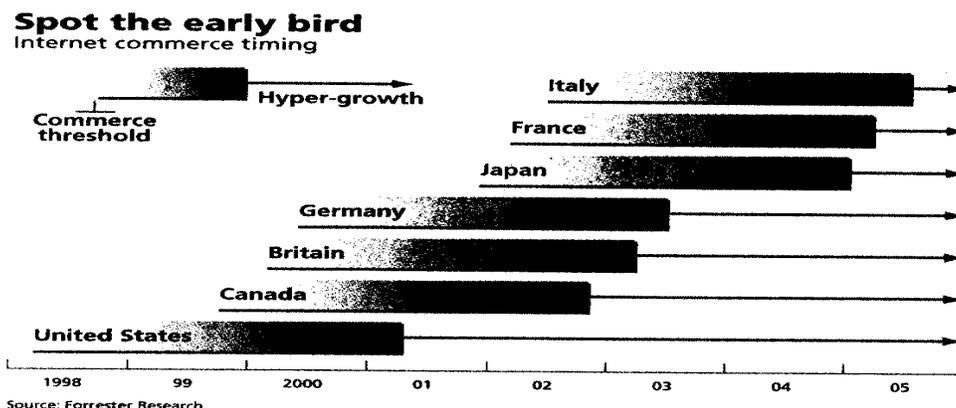


operations are three items that will have about equal, but greater, significance in the future. What is not being planned is also interesting. Support for multiple payment methods and integrated supplier databases are not being planned.⁵

Perhaps the most important aspect of the e-business evolution is the timing of e-commerce internationally. According to a study by Forrester Research (See Figure 3), the United States experienced take off “threshold for hyper-growth” in e-commerce in early 1998, Canada followed in late 1999, Britain at the start of 2000 closely followed by Germany. Japan, France, and Italy should take off, according to the study, sometime in 2002.⁶

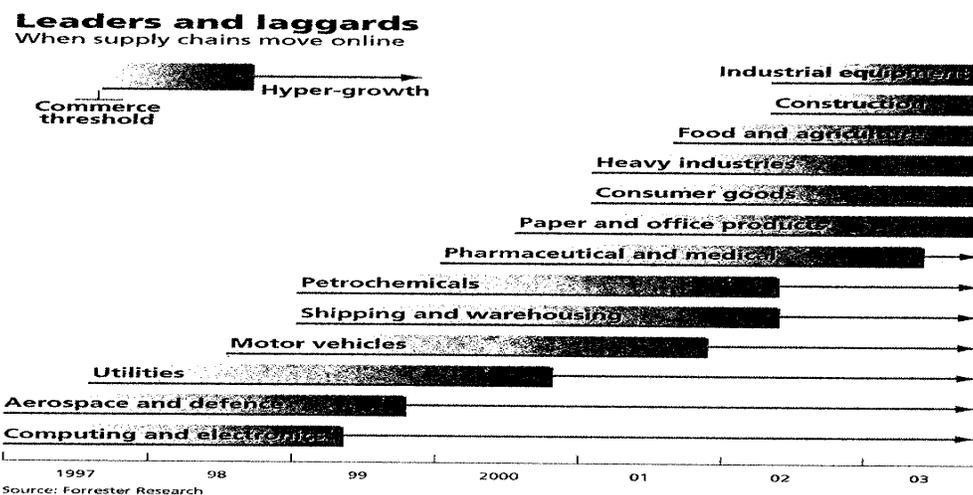
The same study also examined the leaders and laggards in e-commerce based on when supply chains moved online (See Figure 4). As previously suggested, the take off thresholds were identified for several groups as follows: (1) computing and electronics and (2) aerospace and defense started at about the same time in early 1997 followed by (3) utilities in about mid-1997. The motor vehicle threshold came in mid- 1998. Early in 1999 (1) shipping and warehousing and (2) petrochemicals entered their hyper-growth period followed by (3) pharmaceutical and medical e-commerce.

FIGURE 3



In 2000, paper and office products are expected to enter their hyper-growth period in e-commerce. Starting in 2001 (1) consumer goods, and (2) heavy industries should experience their entry into e-commerce hyper-growth followed by (3) food and agriculture in late 2001. In early 2002, (1) construction and (2) industrial equipment are expected to enter their take off threshold into e-commerce hyper-growth.⁷

FIGURE 4



These are very important conclusions not only as far as the general state of e-commerce is concerned, but also for SMEs specifically. Smaller manufacturing enterprises frequently

participate in the supply chains of larger manufacturing enterprises. They tend to support the operations of larger manufacturing enterprises locally or regionally. According to many predictions, including the findings in the above studies, participation in e-commerce, and more specifically, in e-business, will force SMEs to become global players.⁸ The key question is whether or not SMEs are prepared to become global players? This paper partly addresses that question.

Another study by Dandridge and Levenburg (2000) reported the other extreme of e-business and the use of the Internet and focused on very small enterprises. The study concluded that smaller enterprises tend not to use websites routinely in their day-to-day operations. The authors of the study proposed that it is the larger enterprises that find websites productive in their operations. The authors concluded that if smaller enterprises expect to grow in the future, they will have to use the Internet as a business tool and may expect to be actively involved in exporting.⁹

The most relevant study that was found examined the use of Internet, websites, and e-business from the point of view of advertising. This study focused on the role of “interactivity” in increasing the attractiveness of websites. The authors of the study examined 101 websites. Although they concentrated on the quality and content of these websites to determine their viability to be included in the Lycos Top 5 percent Site List, the authors provide an interesting insight into the future viability of websites for smaller enterprises such as SMEs.¹⁰

Based on the review of literature above and the available sources of information pertaining directly to SMEs, it can be concluded that very little useful information is available concerning the use and maintenance of websites by SMEs. Some anecdotal information based on managerial experience suggests that, because many SMEs are managed by individuals who

tend to be either production- or sales- oriented, they tend to rely on their own individual skills rather than take part in some broad Internet-based effort.

The literature dealing with the use of websites as a viable marketing tool by SMEs is nonexistent and therefore there is a lack of conclusions that can be made. There is a need to explore this issue further. SMEs need to be connected to the world of global e-commerce and become partners in e-business. This is particularly the case when SMEs want to enter the world of business-to-business marketing and when they plan for strategic future survival.

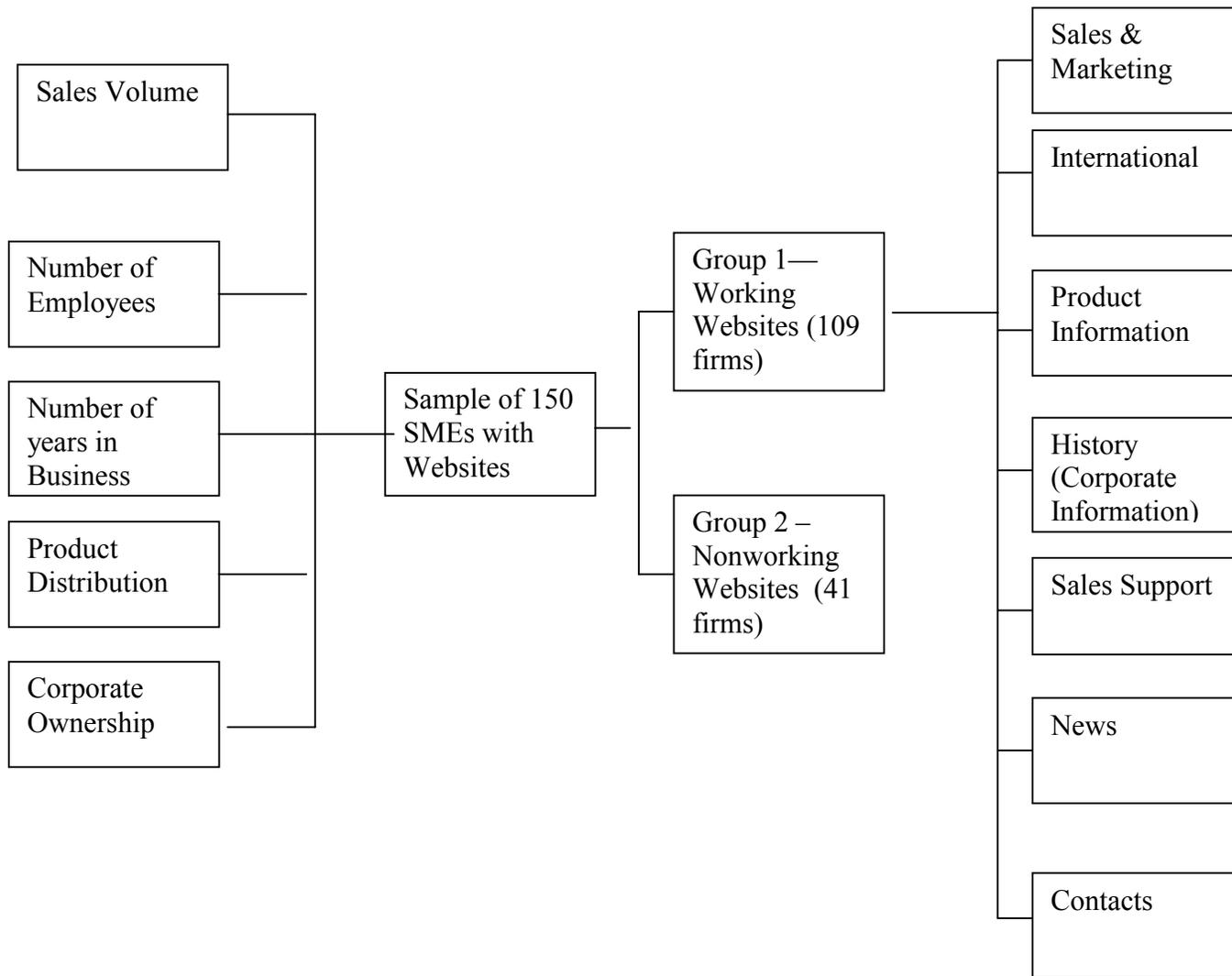
The following exploratory study focused on the use of websites among SMEs to determine (1) whether a statistically significant difference exists between those SMEs that are maintaining a website and those that do not and (2) what is the content of those websites that are maintained by SMEs? Figure 5 presents the schematic model that was used to design this study.

METHODOLOGY

This is an exploratory study that was conducted in a single homogeneous business environment to minimize the influence of (1) local managerial practices and conditions on the acceptance of new technology, (2) the regulatory structure on the operations of the local cluster of SMEs, and (3) taxation on manufacturing enterprises. These conditions are important not only from the SMEs' perspective, but also from the point of view of conducting similar studies in similar types of homogeneous business environments.

The sample for this study was drawn from Wisconsin Manufacturers Register.¹¹ The directory listed 12,850 manufacturing enterprises. To be a part of this sample, the individual enterprises had to be in SIC 3400 to 3799 categories and had to employ fewer than 500 employees. A total of 4,692 smaller manufacturing enterprises were identified for this study. Out of the 4,692 SMEs, 20.2 percent, or 949 SMEs, had websites. A random sample of 150

FIGURE 5



SMEs was selected from the 949 SMEs for this study.

A simple research instrument was developed to classify the responses for the study. Due to the nature of the classification process used in collecting the data for the analysis, mostly cumulative frequencies, the Kolgomorov-Smirnov test was used for all questions except the last where Univariate Analysis of Variance was used.

FINDINGS

Out of the 150 SMEs in the sample, 109 (72.7 percent) had working websites while 41 (27.3 percent) did not. The SMEs that had working websites were labeled as Group 1 and those that did not have working websites were labeled as Group 2. The analysis of the data suggests that the two groups do not have statistically significantly differences. That is, there are no differences between the two groups in terms of the variable used in the analysis. The results are presented in Table 1.

TABLE 1

Differences Between Group 1 and Group 2

Variable	F-ratio	<i>P</i>
Sales volume	0.7214	0.3970
Number of employees	0.0728	0.7877
Number of years in business	0.0015	0.9687
Product distribution	0.0155	0.9012
Corporate ownership	1.1895	0.2772

Group 1 equals 109 SMEs, Group 2 equals 41, total 150 SMEs.

The above findings suggest that the size of SMEs measured in terms of their annual sales volume and the number of employees is not a predictor of whether or not a given SME will maintain a website. The age of the SME measured in terms of the years in business is also not a predictor nor is the nature of corporate ownership. This very likely means that SMEs are responding to some other internal or external factors that are much more subjective than the factors used in this study. It is possible to speculate that SMEs are responding to pressures from

their customers to establish websites for greater ease of transacting business (e-business), or it is also possible that the local government, on the State level, initiated a policy of encouraging SMEs to enter into the age of information technology. This is the case in the State of Wisconsin.

The website content analysis is presented in Table 2. Product and contact information is by far the most frequently posted information on the website. SMEs want to let present and potential customers know what products they are offering and whom customers should contact to place an order or receive additional information. The majority of SMEs also want to communicate information about the history of their company. Slightly more than half of SMEs post information concerning their sales and marketing efforts. Less than a quarter of SMEs studied were concerned with posting information about their sales and marketing support personnel. These findings support the conventional notions that the SMEs are still very much production-oriented enterprises managed by individuals interested in the production and sales of their products.

TABLE 2

Content Analysis of SMEs' Websites: Results for Group 1

Website features	n	percentage
Product information	107	98.2
Contacts	105	96.3
History	94	86.2
Sales and marketing	68	62.4
News	50	45.9
Personnel (sales support)	24	22.0
International aspects	20	18.3

(N=109)

The relatively low international content is very surprising. Only 18.3 percent of SMEs included any international content at all. It is not clear whether the managers managing the SMEs understand Internet access operations at all. The extensive push for globalization and

many programs developed and focused exclusively at SMEs are designed to stimulate global activities among SMEs, yet, as their websites clearly indicate, they are not responding.

The content analysis focusing specifically on the international aspect of websites considered such issues as the use of foreign languages, location of sales offices abroad, ownership of subsidiaries, distribution arrangements abroad and even related operations abroad. Although these concepts are an integral part of the broader concept of international operations, they are seldom included in SMEs websites.

CONCLUSION

There are several important conclusions that can be generated from this study. Out of a sample of 150 SMEs located in a single homogeneous business environment, only about 20 percent maintain viable websites as part of their business operations. Although there are no similar studies that can be used for comparisons, the percentage appears to be low. It is possible that the SMEs have not reached their threshold level, and that they are at the beginning of their hyper-growth period as suggested above.

Those SMEs that have active websites tend to use them in a very limited way. Instead of opening the enterprise to additional activities in e-business, they are limiting their activities to product presentations and providing information on how to contact the enterprise. Sales and marketing in a broad international context is still not a significant part of their website presentation.

Some public policy specialists such as state export development specialists who expect SMEs to actively get involved with export promotion and competition may have to rethink their strategies regarding the use of websites. Perhaps they need to focus on how SMEs develop and

manage their websites and what kind of information they post. The export specialists may need to offer training on the importance and use of websites in the age of information technology.

FUTURE RESEARCH

Since this is an exploratory study focusing on a local cluster of SMEs in a single homogeneous business environment, it may have several limitations. First, since many states in the United States and countries worldwide have different policies regarding SMEs, it might be useful to examine similar issues relating to SMEs and their use of websites. Some governments may encourage SMEs to become a part of the information technology age and some may not. Second, on the enterprise level, it might be useful to examine the use of websites by SMEs more closely to determine what internal factors contribute to their propensity to use a website as a sales and marketing tool. And, finally, this study examined SMEs' websites. Future studies should not only examine websites, but should also collect information from management about their perceptions and expectations from websites and their role in e-business in the near future.

In spite of these limitations, it is expected that this study can be replicated in other business environments. SMEs in other states in the United States and countries in other parts of the world are faced with similar operating conditions. The information technology revolution is pervasive worldwide. The methodological approach developed in this study should provide a suitable foundation for comparative studies in several countries with an important SME base. The expectations are that similar conclusions will be reached in those instances as in the current study.

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