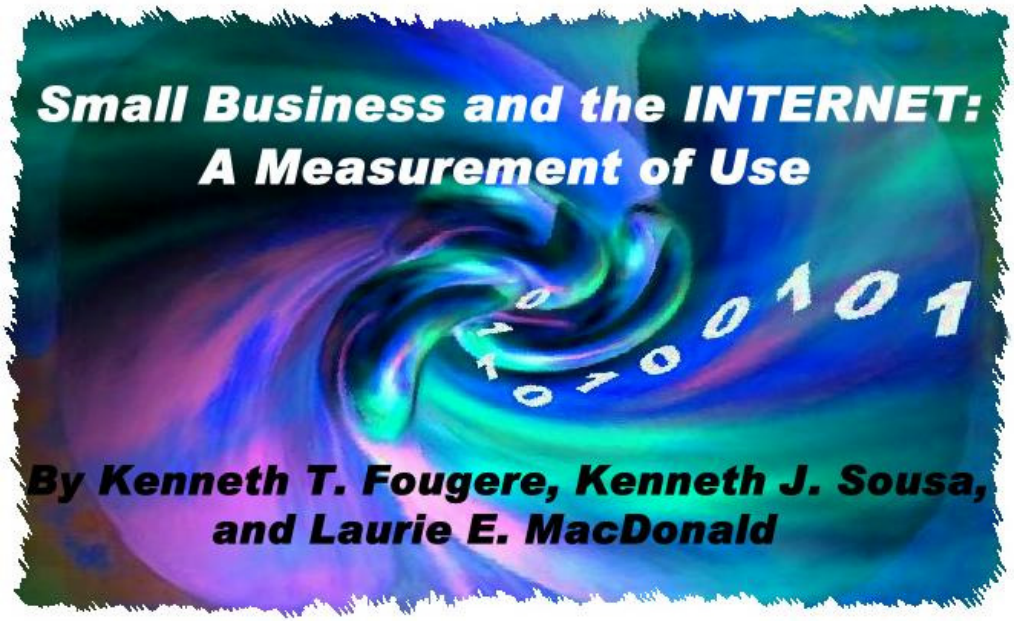

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Abstract

The field of Internet communication technology continues to change at a rapid rate. Companies unable to keep up will, say the authors, find themselves at a competitive disadvantage in their endeavor to expand their customer base and services. The opportunities for small businesses to take advantage of this technology are severely challenged due to such constraints as inadequate financial resources, insufficient technical expertise, and problems in managing resources. In spite of these constraints, many small businesses are successfully transitioning their businesses to the Internet. The study reported on in this paper was developed to measure the current level of experience and use of the Internet by small businesses in the State of Rhode Island.

Introduction

As the world of business continues to evolve, technology has become a driving force. The pace of this change, as evidenced by new products, services and expanding business applications continually represents a challenge to the management skills as well as the financial resources and technical expertise of small business owners.

However, in order to remain competitive, small business must find ways to constantly improve their business practices and presence in the world. Small business makes a distinctive and creative contribution to the American economy. They produce a major share of business innovation, and their numbers make them the largest source of private employment in America today (Caratolo 2005). Electronic Commerce offers small businesses an opportunity to remain competitive and innovative. Electronic Commerce (ecommerce) has been defined as the process of buying and selling products or services by using electronic data transmission over the Internet and the World Wide Web (Grandon and Mykytyn 2004).

Exactly what is a small business? The U.S. Small Business Act states that a small business is one that is independently owned and operated and is not dominant in its business. The law also states that the definition of a small business varies from industry to industry (Anonymous 2004a). The Small Business Administration (SBA) continues to refine its definition by attempting to reduce the categories they use and to base their definition only on the number of employees. Currently there are 37 categories, some based on number of employees, and others based on annual revenue (Hardy 2004). For purposes of this study, the survey is based on the small businesses in Rhode Island that are registered with the Rhode Island Small Business Development Center (RISBDC). The list of these companies was provided by the RISBDC director.

The purpose of the Rhode Island Small Business Development Center (RISBDC) is to assist entrepreneurs to transform their business, to increase their stability, profit efficiency, and capacity for future growth. Therefore, the center provides guidance, training, and consulting services to its clients. The consulting services are at no cost, while the educational services are at a low cost (Anonymous 2005).

Research reveals that using the Internet in their daily business activities provides a small business with many advantages. Among those reasons is the promise of future opportunities (Poon and Swatman 1999). Some examples of these opportunities include promoting your business presence by promoting your web site (Anonymous 2003a) and through email advertising (Anonymous 2003b).

Another reason for using the Internet is that it provides a quick way to gauge the level of customer satisfaction with your product or service. Instruments for measuring this have been developed and are available (McKinney, Yoon, and Zahedi 2002).

It is imperative that a bond of trust exists between a business and its customers. This issue has to be a high priority one for businesses to remain successful (McKinney, Yoon, and Zahedi 2002). This trust encompasses having both accurate information and the understandable organization of that information on the web site (McKnight,

Choudhury, and Kacmar 2002). Another factor regarding trust is how a company deals with their product return policy (Caratolo 2005).

Fortunately for small businesses today, there are a myriad of web sites available to help you get started in developing a web site. A few examples are referenced (Anonymous, 2004b; Anonymous 2003a; Caratolo 2005; Kim and Eom 2002; Rao, Metts, and Monge 2003; Wilson 2005). Obie offers specific guidelines for small businesses when developing a website.

The research study reported on here focuses on the use of web-based purchasing tasks in a business-to-business (B2B) environment. Organizational buying is defined as the decision-making process by which formal organizations establish the need for purchased products and services and identify, evaluate, and choose among alternative brands and suppliers (Webster & Wind, 1972). Ultimately, the business market consists of organizations that acquire goods and services to be used in the production of other products and services that are sold, rented, or supplied to others (Kotler, 2003)

Methodology

A survey form was developed in order to determine the current level of use and experience with the Internet by small businesses in the State of Rhode Island. The research was carried out in two stages. The first stage consisted of in-depth interviews with the owners of three small businesses known to be using Internet technology in their business operations. These interviews were used to help the researchers refine the questionnaire's language and terminology and to control the use of "jargon" that might be unfamiliar to most small business owners.

The second stage involved completing the design of the survey form, which was then pilot tested on selected small businesses as suggested by the director of the SBDC. In order to minimize response bias, the design of the survey included the reversal of various Likert scales. After implementing additional minor changes, the survey form was prepared for distribution.

The RISBDC provided mailing list data for all businesses that utilized their services (consulting and seminar attendance) during 2005 and 2006. These parameters provided a survey population consisting of clients that have utilized the Center's services. Their recent use of the RISBDC's services suggests these businesses' managers are interested in soliciting advice about the operation of their businesses.

The survey was administered through an instrument delivered through a web-based environment. Each of the people on the mailing list provided by the RISBDC was sent an email personally addressed to the participant. The email letter also included a "personalized" Uniform Resource Locator (URL) for the participant to access the web-based survey. The URL incorporated specific demographic identifiers, such as the NAICS code, that would be stored with the respondent's completed survey data. This eliminated the need for the respondent to enter the information. In addition, it increased

the accuracy of the demographic data for statistical analysis. Embedding the URL as a "clickable" link directly in the letter eliminated the need for the participant to open a browser and enter the address manually.

The constructs which will determine the web-based purchasing tasks were developed using the industrial buying model developed by Webster and Wind (Webster & Wind, 1972), the model of organizational decision processes that defines five stages of the buying process. Four of these stages can be assisted with the functionality of electronic procurement technology: establishing objectives and specifications, identifying buying alternatives, evaluating alternative buying actions, and selecting the supplier. Ruth (2000) developed three items to measure the usage of a consumer online experience that included researching, ordering and remitting payment. Since the business-to-business buying model is more complicated than a consumer model, the Webster and Wind model was combined with the structure of Ruth's model. These discrete items associated with B2B purchasing tasks will measure the use of web-based purchasing systems.

The objective of this research study was to gain insight on the use of electronic business systems by professionals employed in small businesses. It is important to determine if there are any differences in usage of these systems by industry classification. An analysis of variance (ANOVA) to determine whether the frequency of use associated with these systems differs by industry classification. The analysis focuses on those respondents who identify themselves as using these systems in their daily responsibilities. If the respondent did not use the WWW in the performance of their job, the survey did not ask for responses associated with use of electronic business systems. The ANOVA focuses on the following five null hypotheses:

1 There are no significant differences between industry classifications associated with the use of electronic business systems for the research of alternative products and/or services.

2 There are no significant differences between industry classifications associated with the use of electronic business systems for the research of alternative pricing.

3 There are no significant differences between industry classifications associated with the use of electronic business systems for the research of alternative suppliers.

4 There are no significant differences between industry classifications associated with the use of electronic business systems for the purchase of products and/or services.

5 There are no significant differences between industry classifications associated with the use of electronic business systems for post-sale activities.

Results

The State director of the Rhode Island SBDC provided the e-mail addresses of 1,025 small businesses. The original sample included 307 that were undeliverable due

to invalid e-mail addresses. This resulted in a survey population of 718 small business firms. Survey responses were received from 133 companies for a response rate of 18.5 percent.

Table 1
Respondent Analysis by Employee

# of Employees	Percent
1 - 2	56
3 - 5	20
6 - 9	9
10 - 19	5
20 - 49	4
50 - 99	4
100 - 199	0
200 or more	2

n = 129

As seen in Table 1 (above), 56 percent of the responses came from companies with 1 to 2 employees and 20 percent from companies with 3 to 5 employees. These two categories accounted for most of the respondents (76 percent). The results shown in Table 2 (below) reveal that the majority of companies (62 percent) had sales of less than $250K, while 53 percent of the responding companies have a sales volume less than $100,000. Nineteen percent were in the range $100,000 to $249,000, followed by 10 percent each with sales of $250,000 - $499,999, and $1 million - $1.9 million.

Table 2
Respondent Analysis by Sales

Sales Volume	Percent
Less than $100,000	53
$100,000 - $249,999	19
$250,000 - $499,999	10
$500,000 - $749,999	0
$750,000 - $999,999	2
$1 million - $1.9 million	10
$2 million - $4.9 million	2
$5 million - $9.9 million	2
$10 million - $24.9 million	2
Over $25 million	1

n = 124

The primary business was noted by 32 percent of respondents as Services; 18 percent indicated they are involved in Retail sales; and 20 percent selected the "Other" category. A significant number of respondents identified themselves as being a service-based organization (48 percent).These data are displayed in Table 3 (below).

Table 3
Respondent Analysis by Industry

Industry	Percent
Construction	6
Finance, Insurance, Real Estate	5
Health Care	4
Manufacturing	7
Retail	18
Services	32
Transportation	1
Communications	4
Wholesale	2
Non-profit	2
Other	20

n = 133

Of the 133 survey respondents, a significant majority (89 percent) reported that they use the World Wide Web (WWW) to perform the responsibilities of their position. Respondents who use the WWW were asked to indicate how often the Internet is used for various business functions on a scale ranging from 1 to 7 where: 1 = Do not use at all and 7 = Use several times each day. The results are seen in Table 4 (below).

Table 4
Frequency Distribution (percent) -- Use of the WWW to Perform Job Functions

Function	1	2	3	4	5	6	7	n
Complete the purchase of products and services	4	2	19	22	41	8	4	116
Research alternatives for products and services	3	1	8	16	35	19	19	118
Research alternatives for suppliers	10	5	15	15	29	13	14	117
Research alternatives for price comparisons	4	3	12	24	31	14	10	115
Initiate post-sale functions	15	5	15	22	29	8	7	117

Use of the Internet to complete the purchase of products and services is used to some degree by 96 percent of the responding businesses. Of these businesses, 41 percent make use of this capability several times each month, and 19 percent do so about once a month.

Researching alternatives for products and services is accomplished several times each month by 35 percent of respondents, and an additional 35 percent do so once a month (16 percent) to once a day (19 percent).

When asked how often the Internet is used to research alternatives for suppliers, 90 percent indicated some use of this function. Of these respondents, 29 percent do so several times each month and 53 percent do so ranging from less than 3 times per year (15 percent) to several times per day (14 percent).

Overall, 96 percent research prices on the WWW. Of these respondents, 31 percent do so several times each month; 24 percent about once a month; 14 percent once a day; and 10 percent several times each day.

At 85 percent, the initiating post-sale functions, such as, order tracking and shipping status, was the least reported function. However, 51 percent use this function, ranging from once a month (22 percent) to several times a month (29 percent).

When asked if their company maintains a web site, 67 percent of the respondents reported that they have implemented a website. The fact that 33 percent (44 of 133) of the responding businesses do not have a company web site is surprising. The importance of the web in today's business environment; the ease with which web sites can be developed; and the low cost of a minimal web site would indicate that almost all business would have some presence on the WWW; even if it is a simple, static page.

Those companies who do not have a website (33 percent of respondents) were asked to rate possible reasons for not implementing a website on a scale ranging from (1) Strongly Agree to (7) Strongly Disagree. The results are shown in Table 5 (below). The means suggest that there is no strong agreement or disagreement with the statements. These responses could suggest a lack of understanding of website development and value.

Table 5
Reasons for Not Implementing a Website

Reason	Mean	n
Websites are too expensive to implement.	3.8	44
Websites are too difficult to develop.	4.3	40
Computer personnel are not available.	4.5	42
A website will not create any value for our organization.	4.7	42
There is no value for our customers using a website.	5.0	42
We do not use computers in our business.	5.5	42

Those companies (67 percent of respondents) that reported that they have a company website were asked to answer a series of question relating to their website. Their response indicate that 44 percent of these companies used internal staff to develop their website, 19 percent used consultants, and 30 percent used a combination of company personnel and consultants. Maintenance of the site is done by company personnel at 49 percent of the companies, 22 percent use consultants, and 18 percent use a combination of staff and consultants. As illustrated in Table 6 (below), 44 percent of the responding companies reported that they update their web site at least once a month.

Table 6
Website Maintenance Frequency

Frequency	Percent
Daily	7
Weekly	6
Monthly	31
Several times per year	44
Other	13

n = 88

Respondents rating of their reasons for implementing a website are shown in Table 7 using a continuous scale from (1) Extremely Important to (5) Not At All Important. The need to establish a web presence (1.4), provide business information (1.5), serve customers more effectively (1.6), boost public interest (1.7), sell products and services (1.9) were all rated as somewhat important to extremely important reasons for implementing a company website. The ability to network with other businesses was rated slightly less important at 2.2. The respondents were neutral on the ability to release sensitive information and provide images, sounds, and videos. The low level of

the means on many of the business strategies would seem to suggest an understanding of the value of a website to the company.

Table 7
Reasons for Implementing Website

Reason	Mean	n
Establish our web presence	1.4	88
Provide business information	1.5	88
Serve our customers more effectively	1.6	89
Boost public interest in our organization	1.7	88
Sell products and/or services	1.9	88
Network with other businesses	2.2	87
Release sensitive materials and information	3.0	89
Provide images, sounds and video files	3.1	88

Next, respondents were asked to indicate the status of various business functions for their website using a four point scale: (1) Function is available for customer use, (2) Planning to implement this function; (3) Function is being reviewed for possible implementation, and (4) No plan to implement the function. The results are displayed in Table 8 (below).

The website's functional support for researching alternatives for products and services was reported by 57 percent, while 10 percent plan to add this feature. Only 17 percent of the companies currently offer a price comparison feature; 14 percent are planning to add this feature; and 8 percent are reviewing it. A majority of 60 percent have no plans to support price comparisons. Functionality for completing purchases is available at 24 percent of the sites; planned at 20 percent; and under review at 14 percent of the responding companies. Forty-three percent have no plans for sales support. Initiating post-sale functions, such as order tracking and shipping status, is the least supported web function. Fifty-six percent do not plan to add support for this function to their website.

Table 8
Status of Website Functions (percent)

Function	1	2	3	4	n
Research alternatives for products and services	57	10	8	24	87
Research alternatives for price comparisons	17	14	8	60	86
Complete the purchase of products and services online	24	20	14	43	87
Initiate post-sale functions	13	14	17	56	87
Find contact information on your organization	84	6	5	6	85

The most widely implemented web feature is providing company contact information. Eighty-four percent of the respondents report that their company provides this information. The rather high percentages for no plan to implement the middle three functions suggest that these companies do not have a champion that recognizes the value of using the Internet for a wider range of purposes. These issues are important ones that can be addressed by the RISBDC by acting in a more proactive way rather than by asking businesses what they hope to gain by implementing a website.

Companies with a website were asked to use a scale from (1) “Extremely Important” to (5) “Not At All Important” to rate the expectations they had before they had a website. The respondents’ data is shown in Table 9 (below). Indicated by the low mean score is that increases in communications with customers; sales via the web; and customer satisfaction were all noted be somewhat to extremely important reasons for implementing a website.

Table 9
Expectations before Website Implementation

Expectation	Mean	n
Increase in communication with customers	1.6	86
Increased level of sales initiated by the website	1.9	87
Increase in customer satisfaction	1.9	87

The companies were then asked to rate their satisfaction with their website after implementation on a scale from (1) “Significantly exceeded my expectations” to (5) “Significantly less than my expectations”. The responses in Table 10 (below) tend to be clustered around the middle of the rating scale. These scores suggest that the post-implementation results were in alignment with the pre-implementation expectations of

respondents. There was no indication of significance in either exceeding expectations or falling significantly short of expectations.

Table 10
Website Performance

Expectation	Mean	n
Increase in communication with customers	2.6	84
Increase in customer value	2.8	83
Increase in customer satisfaction	2.8	84
Increased level of sales initiated by the website	3.2	84

The analysis of variance test (ANOVA) statistical test focused on the 95 observations which included a specific industry classification. As shown in Table 11 (below), the results of this analysis calculated significant differences between industry classifications for two purchasing tasks: Research Suppliers (.001) and Post-Sales activities (.008). The mean values for these questions are shown in Table 12 (below). The mean values associated with the industries with higher frequency of use for researching suppliers (4.50 – 7.00) and post-sale activities (3.95 – 7.00) indicate using these systems at least once a month. The remaining industries indicate very infrequent usage: three times per year or less.

Table 11
ANOVA

Hypothesis	Research Question	Sig.	Status
1	Purchase	0.188	Accept
2	Research - Products	0.503	Accept
3	Research - Suppliers	0.001	Reject
4	Research - Price	0.059	Accept
5	Post-Sales	0.008	Reject

Table 12
Descriptives

Question	Industry Classification	n	Mean
Research - Suppliers	Construction	7	4.00
	Finance, Insurance, Real Estate	5	2.80
	Health Care	4	1.75
	Manufacturing	7	4.57
	Retail	22	4.50
	Services	39	4.77
	Transportation	1	7.00
	Communications	5	2.40
	Wholesale	1	7.00
	Non-profit	3	2.67
	Total	***94***	***4.26***
Post-Sales	Construction	7	3.29
	Finance, Insurance, Real Estate	5	2.40
	Health Care	4	2.25
	Manufacturing	7	5.00
	Retail	22	3.95
	Services	39	4.21
	Transportation	1	7.00
	Communications	5	4.00
	Wholesale	1	5.00
	Non-profit	3	1.67
	Total	***94***	***3.90***

Conclusions

This research was undertaken to measure the current level of use and experience with the Internet by small business in the state of Rhode Island. Based on the responses to the survey, the vast majority of the respondents (85 percent) employ less than ten people and have a sales volume of less than $500,000. Even though based on personnel and sales these companies are small, it was still surprising to see that one third of them do not have a company website. The authors suggest that the RISBDC, by assuming a more proactive role, can demonstrate to these companies the importance of developing a website, if only as a static website to begin with, because these companies clearly need to be further educated about the value of a website.

Of those companies that do have a website, they seem to have an understanding and appreciation of the potential of the site to help their business. However, as indicated in Table 7, some of the benefits are still unrealized.

The results of the ANOVA statistical tests clearly indicate that the personnel in some industries use electronic purchasing systems for the purchasing tasks associated with researching supplier alternatives and post-sale activities. The remaining tasks indicate that researching price and product alternatives as well as the actual purchasing of products and/or services do not indicate that industries use electronic business systems for these purchasing tasks differently.

It is clear that manufacturing, services and retailing utilize web-based systems to research alternatives for suppliers. The extensive number of business organizations that have adopted some level of web-based systems to advertise and promote and disseminate information about their products/services have created an environment to "surf" through the various suppliers' web sites for these alternatives. Purchasing tasks do not rely on a catalog-based environment as they did in the past. The level of business adoption as well as the speed to search for supplier alternatives provides an efficient methodology of completing this task.

The ability of business organizations to gather information on the status of orders and shipping and payment appears to illustrate a significant difference in usage of web-based systems for these industries. Again, in a similar manner as researching supplier alternatives, it is more efficient to extract post-sale information from supplier websites in a web-based environment--with increased usage for manufacturing, retail, services, and communication industries.

Lastly, respondents' expectations of their websites tended to be satisfactory to those who had them. While this is true, an obvious revelation provided by the survey is that there is much more that a website can do for these businesses. It is the authors' opinion that there needs to be more communication with the non-adopters of sites on the Internet in order to explain to them the ramifications of having their own website, as well as further communication with the adopters of the Internet as to how they can harness additional power from the Internet through website enhancements.

While a reasonable number of observations were gathered for this research study, the validity of the results would be increased with additional observations. Specifically, the results associated with the industry classification analysis included significant differences with a limited number of responses in comparison with other industries. In some cases there was only one observation. The majority of the observations (64 percent) used as the foundation for the ANOVA statistical test focused on two industries: services and retailing. The results of this research would be strengthened by increasing the number of observations in the various industry classifications.

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Note: The title graphic was designed by Carole E. Scott