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DEMAND FOR E-BUSINESS SUPPORT SERVICES AMONG NEW BRUNSWICK SMES¹

SMEs that are adopting Internet technologies and e-business solutions often require business support services. This paper summarizes the results of a 2004 survey of 280 New Brunswick SMEs, describes patterns of demand for support services, and tests significance of six factors that are postulated to affect demand for services (firm size, growth orientation, technological capability, solutions to business problems, desired business capabilities, and intensity of competition).

Introduction

A key contemporary management issue is how to profit from the networked interactivity made possible by advances in ICTs (Amit and Zott, 2001; Porter, 2001). SMEs would seem well placed to benefit from the Internet and e-business, since these new technologies lower barriers to entry, reduce the constraints of distance, and reward some new business models. However, numerous studies have demonstrated the relatively slower rate of adoption of e-business by small and medium enterprises (SMEs). In the aggregate, larger firms are the most rapid adopters, and the smaller firms the slowest adopters, of Internet technologies and e-business solutions (CEBI, 2004; Davis & Vladica, 2004).

In most countries, SMEs make up the majority of firms.² Canada has more than 2.2 million SMEs, representing 99.7% of all firms. Of New Brunswick's 28,488 firms with paid employees, about 97.8% have fewer than 500 employees (CFIB, 2003). In view of the importance of SMEs in the economy and their role in job creation, it is a challenge to "bring lagging SMEs online and deepen the capabilities of those already online" (CEBI, 2004).

Because SMEs by definition have limited internal resources, use of external services is expected to increase SME competitiveness and market opportunities (Bellini, 1998). The availability, adequacy, and effectiveness of external business services is an important innovation policy issue. It is an ongoing challenge to ensure that support systems are efficient and

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² In Canada, small and medium enterprises are defined as firms with fewer than five hundred employees.

effective in helping SMEs to become competitive. Typically, services are provided by public as well as private actors. No consensus exists regarding best practices in the area of SME support services, and there is considerable debate about how much subsidy is warranted and the appropriate degree of financial self-sufficiency of service providers. These are significant issues in respect of support for adoption of Internet technologies and e-business solutions because the emergence of local demand for business services for SMEs is a potentially important development pathway for indigenous IT supplier firms. In other words, the development of effective local or regional e-business supplier capability must be part of the overall goal of e-business enablement of a local or regional SME population.

In this paper we discuss patterns of demand for e-business support services among New Brunswick SMEs. Below we briefly review the literature on innovation and business services (which are sometimes referred to as producer services or knowledge-intensive business services). We then summarize key results of a recent survey on adoption of Internet technologies and e-business solutions among SMEs in New Brunswick. In the final section of the paper we investigate the effects on demand for various e-business support services of six postulated groups of factors.

Research results reported here are based on data collected in an online survey of use of Internet technologies and e-business solutions among SMEs in New Brunswick in March and April, 2004. The survey was conducted under the auspices of the Electronic Commerce Centre in Saint John. SME participation in the survey was solicited via local economic development agencies in New Brunswick. 280 usable responses were received, representing a response rate of about 12% - nearly double the reported average response rate for web-based surveys. Firms provided information regarding technology use, the economic and social characteristics of the firm, perceived constraints to and facilitators of adoption of Internet technologies and e-business solutions, perceived impacts or benefits of adoption of these technologies, and desired support services. For complete results of this survey, see Davis & Vladica (2004).

Overview of e-Business Solutions and Internet Technologies Use among New Brunswick SMEs

Firms were queried regarding their method of Internet connectivity, their use of sixteen Internet technologies and e-business solutions, their website functionality, and their online business activities. Responses indicate that the simplest Internet technologies and e-business solutions (such as e-mail, PCs, and use of the Internet for information searches) are in practically universal use among New Brunswick SMEs. Dial-up connections remain widespread, but faster and more flexible methods of connecting to the Internet are being taken up by the SME community. For instance, 60% - 70% of firms with 5-49 employees have adopted high speed connections, and around 10% of all firms use wireless connections. In general, larger SMEs adopt the more complex Internet technologies and e-business solutions more quickly than their smaller counterparts. Two-thirds of SMEs report having plans for further investments in Internet technologies and e-business solutions; their focus is on website content development and design, conducting secure transactions with business, government, and customers, and on Internet marketing (Davis & Vladica, 2004).

In terms of volume, about half of New Brunswick SMEs' Internet-based sales are conducted by very small firms (5-19 employees) and about one-quarter by medium-sized SMEs (50-499 employees) (Davis & Vladica, 2004). However, microenterprises (firms with fewer than 5 employees) lead in adoption of business models relying on Internet-based sales. Around three-quarters of New Brunswick SMEs use the Internet to purchase goods or services. Once again, size appears to be a factor in the adoption and use of Internet technologies and e-business solutions. The larger the SME, the more likely it is to purchase goods and services over the Internet. Around 90% of medium-sized firms purchase over the Internet, while around 70% of microenterprises use the Internet for purposes of purchasing (Davis & Vladica, 2004).

New Brunswick SMEs that have adopted Internet technologies and e-business solutions in varying degrees report a broad range of benefits from their engagement in e-business (Davis & Vladica 2004). Many of the reported impacts are highly qualitative, having to do with image, relationships, speed, and agility. New Brunswick SMEs report greatest benefits in the areas of improved relationships with customers, improvement in brand and image, increased adaptability to customers' requirements, and increased speed of delivery.

However, most of the reported benefits of e-business engagement are generated in the domestic market. The Internet has not led to significant internationalization of New Brunswick SMEs, which earn around 62% of their revenue in the local market. Among New Brunswick SMEs, microenterprises have the highest rate of Internet-based export sales (on average 26% of their Internet sales are to international customers) and medium enterprises the lowest (10%). This is a reflection of the ability of some microenterprises to create business models and specialty niches that lend themselves to Internet commerce (Davis & Vladica, 2006).

Business Services and e-Business Innovation

Business services are critically important inputs in innovation (Aslesen & Langeland, 2003) and so can be considered factors of production or as co-producers of innovation (Drejer, 2002; den Hertog, in press). Furthermore, business services are increasingly important factors in regional and local economic development (Muller & Zenker, 2001). Knowledge-intensive business services tend to concentrate in urban areas, where they strongly contribute to innovation-based competitiveness of these areas (Drejer, 2002; Wood, 2002). The challenge is to develop coherent and effective enterprise support programs (Henry, Hill & Leitch, 2003). Regional economic development policies need to ensure that appropriate support and incentives are available to SMEs of all stages of innovation intensity (Nauwelaers & Wintjer, 2002). Good practices for e-commerce awareness creation encompass general awareness activities, action via intermediaries, and focused support to SMEs (Papazafeiropoulou et al., 2002).

Business service providers need to know the market for services well enough to understand the segments and bundle services accordingly (Atherton & Lyon, 2001). However, a scientific understanding of business services as innovation inputs requires additional features. The first is the need for empirical, theoretically-grounded knowledge of the extent, use, and impacts of external business services. While a literature has emerged that addresses these issues generally (e.g. Bennett & Robson, 2003; Boter & Lundstrom, 2005), only a small empirical literature exists on business support services for e-business innovation among SMEs

(e.g. Simpson & Docherty, 2004). The second necessary feature of scientific knowledge regarding the role of business services in e-business innovation is the development of models that trace out cause and effect relationships. The literature contains many models of IT adoption and value creation by firms. Stage or 'ladder' models are popular in policy and some scholarly literature on e-commerce adoption by SMEs. They refer to steps of engagement in increasing technological complexity or process integration. Unfortunately, while stage or ladder models make conceptual sense, they do not seem to accurately describe SMEs' behavior (Levy & Powell, 2003; Zheng et al., 2004). Empirical research suggests instead patterns of adoption in specific functional areas of the firm, often in response to perceived opportunities or threats represented by customers, suppliers, or competitors (Levy & Powell, 2003). Results of our research, described below, suggest that problem solving, accumulated experience with e-business solutions, and strategic development of business capabilities are three very important factors affecting adoption of e-business solutions and Internet technologies.

We elicited information about the past use of business services and about the planned use of e-business support services. Over 60% of respondents in our survey report having used externally supplied business services. However, the smaller the firm, the less likely it has used external services. Slightly more than 50% of microenterprises have used external business services, but all medium firms have. Furthermore, firms of different sizes tend to prefer different kinds of support services (Figure 1). In New Brunswick, medium SMEs are major users of technical services, while very small and small SMEs purchase training, strategic management, and marketing support services. Most SMEs design, develop, and operate their e-business solutions internally (Davis & Vladica, 2004). Small SMEs are most likely to have designed and developed their own solution. As firms increase in size, hosted solutions and turnkey solutions become attractive.

Many external services are available to firms. A recent study of support services in Europe identified more than 300 non commercial public services on offer to SMEs (Sheikh et al., 2002). In the case of our survey, we solicited expressions of interest regarding nine particular e-business support services: personalized, expert advice on e-commerce; examples (case studies) of similar businesses; recommendations about e-commerce solutions relevant to specific sectors or types of business; directory of organizations that can offer help in using e-commerce; sector-specific online seminars on e-commerce; sector-specific classroom-based seminars about e-commerce; interactive questionnaire to help define an e-commerce strategy; statistics and graphics about e-commerce adoption and use among different sizes or types of companies in New Brunswick; and visits to successful companies.

Figure 2 provides a list of these nine e-business support services rank ordered according to degree of preference by New Brunswick SMEs. Personalized advice, examples or case studies, and recommendations regarding e-business solutions are the services in most demand. More than 40% of SMEs would be likely to use such services. The profile of demand varies by size of firm. However, in the case of practically every kind of business service and size categories, at least 20% of the firms express interest.

IT service firms are among the smallest and least export-intensive of all IT firms in New Brunswick (Davis & Schaefer, 2003). Many are almost completely dependent on local demand for survival. New Brunswick SMEs appear to be demanding customers of suppliers of e-business services. The most desired quality of training, consulting, or other business ser-

vice providers is affordability; the second and third most sought-after qualities are credibility/expertise and good reputation/referrals/image (Davis & Vladica, 2004). Services that are flexible and locally supplied are also considered to be important. Our research suggests that locally available services are perceived to be expensive and not always entirely reliable. Demand exists for a range of Internet related business and support services, but these services need to be priced and delivered to customers in suitable ways.

What Influences Demand for Business Services? Testing Six Groups of Factors

In this section we present results of independent-sample t-tests for significance of difference of means between firms that express interest in the e-business support services listed in Figure 3, and those that don't. (The dependent variable is dichotomous; predictor variables are described below). Each e-business support service is tested separately. Because of space limitations, we present only summary results here. We tested for effects of size, growth orientation, technology use capabilities, desired business capabilities, and problem-solving on interest in nine e-business support services.³

Size. On the basis of the findings of Sheikh et al. (2002) and with reference to our own empirical findings presented earlier, we postulate that the larger the SME, the more likely it will express interest in a particular e-business support service. We measured size in terms of revenues and as number of employees. See Table 1 for results. We found no significant revenue effects on preferences for support services. Regarding number of employees, *smaller* firms are significantly more interested than larger firms in receiving personalized, expert e-business advice about e-commerce. Larger firms are significantly more interested than smaller firms in receiving advice about sector-specific e-business solutions (Table 1).

Growth orientation. Growth oriented firms are reported to be more interested in external business services than firms that are not growth oriented (Sheikh et al., 2002). Our independent variable is the average annual rate of growth for the past three years, which we assume to represent growth orientation. For each of the nine e-business services under consideration, we found no significant differences in interest between growth-oriented firms and non growth-oriented firms.

e-Business Technological Capabilities. Successful adoption of Internet technologies and e-business solutions requires development of internal competencies (Chaston & Mangles, 2002; Williams 2002). We tested for effects of ability to use Internet technologies and e-business solutions, as evidenced by reported extent of implementation. We developed four indices of e-Business technological capability (i.e., ability to use e-commerce technologies): an index of connectivity, an index of Internet commerce involvement, an index of website functionality, and an index of e-business solutions use (for details on index construction see Davis & Vladica, 2004). Results of t-tests are shown in Table 1. In general, the greater the technology-use capability, the greater the interest the firm expresses in external services. This is particularly true regarding online questionnaires to help define strategy, recommendations about e-business solutions, and statistics and graphics about e-business adoption.

³ Other factors known to influence use of business services are price, certain characteristics of the owner such as education, sector of affiliation, and degree of trust in the service provider.

Desired Business Capabilities. Development of business capabilities in order to achieve strategic objectives is a plausible motivation for interest in external business services. We asked firms to indicate whether or not they were interested in developing nine business capabilities that can be related to e-enablement - interactivity with customers, supply management, purchasing, strategic planning, marketing, new product development, entrepreneurship and leadership, change management, and technology. Results of t-tests are summarized in Table 1. It is clear that desire to develop various business capabilities is significantly related to interest in external services. This is true in many cases for eight of the e-business support services, but infrequent in the case of technology development.

Solutions to Problems. E-Business service providers pitch their services in terms of solutions to problems. For this reason, service providers attempt to understand SMEs' "pain points." We tested for effects of seventeen potential barriers to success on interest in e-business support services. Importance of each barrier was measured on a five-point Likert scale. The barriers to success are purchasing supplies and raw materials, keeping overhead costs down, equipment costs, improving the quality of products and services, developing niche or specialized markets, increasing staff productivity, attracting and retaining key staff, delivery of products or service to customers, attracting new domestic customers, finding customers abroad, managing customer information, getting the marketing message out, overcoming geographical distance from customers or suppliers, managing and communicating with mobile staff, managing office information technology, implementing new information and communication technologies, and managing and reporting financial and tax information. Results are summarized in Table 1. Results provide substantial evidence of association of business problem-solving with interest in business services.

Perceived intensity of competition (results not shown). Firms indicated intensity of local, national, and international competition on a three-point Likert scale. We found only minor evidence of effects of intensity of competition on demand for e-business services.

Conclusions

Our results suggest that e-Business enablement occurs as firms solve business problems and improve their capabilities, which frequently is undertaken for strategic reasons. Service providers have many opportunities to increase the uptake of e-business in New Brunswick by influencing the capability development aspirations and the problem-solving activities that are known to facilitate adoption of e-business by SMEs. Private and public service providers that help SMEs solve problems of fulfillment, product or service quality, market development, cost reduction, or the other barriers to success that SMEs encounter, can also help these firms to improve their e-business capabilities, since information technology underpins most contemporary business practices in these areas. In particular, the use of Internet technologies within the New Brunswick SME community can be improved by focusing on two key areas: **Identify and provide services in support of e-business learning needs.** SMEs that have a learning orientation are probably better suited to adopt and exploit Internet technologies and e-business solutions than other firms are. **Facilitate the development of a community of service providers.** The expansion of e-business capability among New Brunswick SMEs implies expansion of the community of business service providers that are responsive to SMEs' development objectives and e-business targets and that can provide the reliable, affordable expert advice sought by SMEs.

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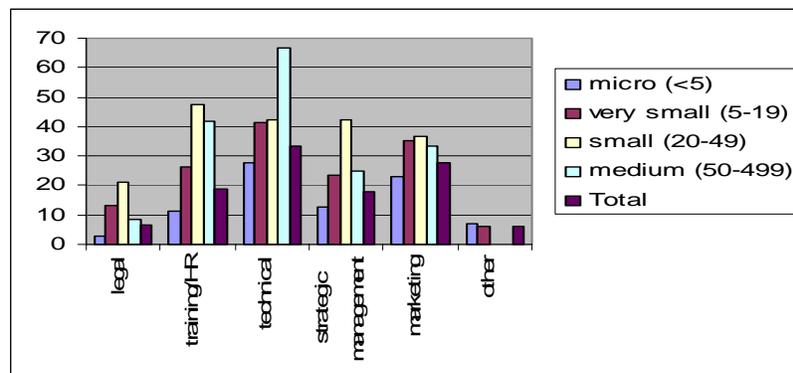
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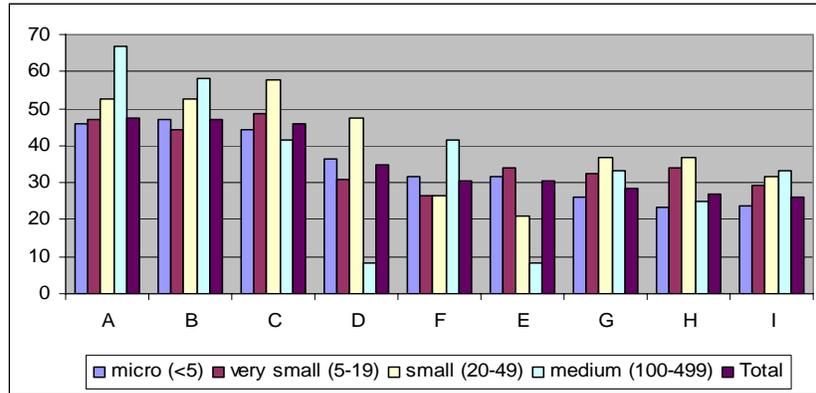
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Figure 1: kinds of external services used by New Brunswick SMEs



Scale: percent of firms in each size category reporting use of business service. N = 280

Figure 2: likely use of e-business support tools or services by New Brunswick SMEs



Scale: percent of firms in each size category reporting likely use of each service.

Legend: A: Personalized, expert advice on e-commerce for your business. B: Examples (case studies) of businesses similar to yours, using e-commerce successfully. C: Recommendations about e-commerce solutions relevant to your type of sector or business. D: Directory of organizations that can offer help in using e-commerce. E: Online seminars on e-commerce in your sector (i.e. tourism, fisheries, manufacturing, etc.). F: Classroom-based seminars about e-commerce in your sector (i.e. tourism, fisheries, manufacturing, etc.). G: Interactive questionnaire to help you define an e-commerce strategy. H: Statistics and graphics about e-commerce adoption and use among different sizes or types of companies in New Brunswick. I: Visits to successful companies.

Table 1: Drivers of Demand for e-Business Support Services

Services (described below) ->	1	2	3	4	5	6	7	8	9
Size									
number of employees	*		*						
annual revenue									
growth orientation									
avg annual growth rate, 3 years									
Technology-use capabilities									
index of connectivity							***	**	
index of e-business use		**					**	***	
index of Internet commerce		***		*	**		**	*	
index of website functionality		***	**				**	**	
Desired business capabilities									
interactivity with customers	***	****	***	***	****	***	****	***	**
supply management		****			**				***

purchasing		*	**		**	***			***
strategic planning	***	****			****	****	****	****	****
marketing	**	****	***	**	***	****	**	**	**
new product development	**	****	**		*	***	*	***	***
entrepreneurship and leadership	**	****	**	****	****	****	****	****	****
change management	**	****	**		**	*		***	***
technology					*				
Solutions to business problems									
purchasing supplies and raw materials									*
keeping overhead costs down				**	***			*	*
equipment costs									*
improving the quality of products and services			*		**				
developing niche or specialized markets	*	***	***		****	**	**	**	
increasing staff productivity		***			****			**	
attracting and retaining key staff		**		**	***		**	***	*
delivery of products or service to customers					*				
attracting new domestic customers		**	***				***	***	*
finding customers abroad		***	**	**	*			**	
managing customer information		*	**				*	**	
getting the marketing message out		**	***		***		**	***	**
overcoming geographical distance from customers or suppliers					**				
managing and communicating with mobile staff		**						***	
managing office information technology		*						*	
implementing new information and communication technologies							*	**	
managing and reporting financial and tax information.		*			***			**	*
* $<.1$; ** $<.05$; *** $<.01$; **** $<.001$ Statistics represent the results of independent-sample t-tests of differences of means.									

Services: 1: directory of organizations that can help you to use e-commerce; 2: interactive questionnaire to help you define an e-commerce strategy; 3: online seminars on e-commerce in your sector; 4: Classroom-based seminars about e-commerce in your sector (i.e. tourism, fisheries, manufacturing, etc.); 5: Personalized, expert advice on e-commerce for your business; 6: Examples (case studies) of businesses similar to yours using e-commerce successfully; 7: Recommendations about e-commerce solutions relevant to your type of sector or business; 8: Statistics and graphics about e-commerce adoption and use among different sizes or types of companies in New Brunswick; 9: Visits to successful companies.