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E-business in professional SMEs: the case of New Zealand

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Abstract

Purpose – The aim of this study is to understand why some New Zealand firms in the professional services industries have been slow to embrace e-business technologies.

Design/methodology/approach – The authors employ a postal survey approach and involve a sample of 500 professional service small to medium-sized enterprises (SMEs) in New Zealand.

Findings – The main conclusion derived from this study is that a combination of factors influences a firm's current and future level of e-business adoption. These factors include: being able to understand potential e-business benefits; being able to respond to customer and competitor practices; being prepared to develop staff skills and knowledge of internet-based technologies (IBTs); and having a well justified and strategic orientation towards e-business.

Research limitations/implications – The research was restricted in scope to professional service sector SMEs in New Zealand. Further research is planned to provide valuable benchmarks of other country and sectoral adoption and diffusion behaviours.

Practical implications – Adopting firms must continue to extend their e-business capabilities and levels of sophistication. The biggest challenge that lies ahead is how to change the mindset of non-adopters and make them realise the benefits that e-business can deliver. In the final analysis choices about new technology and the exploitation of e-business opportunities must be owner-manager led.

Originality/value – The contribution of this research is that the relationship between technology adoption and professional service-sector firms in New Zealand has become better understood. Implicitly the study has revealed the factors that impact on the decision-making processes of owner-managers in relation to the adoption (or otherwise) of IBTs for business purposes.

Keywords Electronic commerce, Small to medium-sized enterprises, Services, New Zealand

Paper type Research paper

Introduction

To remain competitive in global markets, e-business has become imperative and encompasses activities such as electronic data interchange, having a web site that is linked with key business processes, and capabilities to buy online (Watson *et al.*, 2000; Maguire *et al.*, 2001; Fillis *et al.*, 2004). It has been argued that competing in the new millennium without internet-enabled capabilities will be similar to "trying to compete today without a sales force or a telephone" (Frank, 1997, p. 31).

There are many studies documenting the advantages associated with adopting internet-enabled technologies for business purposes (Quelch and Klein, 1996; Hamill and Gregory, 1997; Keogh *et al.*, 1998). Despite these much-publicised advantages, recent research has shown that a large number of small to medium-sized enterprises



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(SMEs)[1] have been slow to capitalise on this new mode of carrying out business (Clark *et al.*, 2001, 2002; Martin and Matlay, 2001, 2003).

E-business uptake in New Zealand has been slow compared with some of its major trading partners, including the US, UK, and Australia (Reed, 2003, p. 1; Clark *et al.*, 2003; McCole and Ramsey, 2004). This suggests that the New Zealand Government's vision "... to be world class in embracing electronic commerce for competitive advantage" as outlined in their New Zealand Government EC Strategy[2] document are not being met (see Ministry of Economic Development (2000) for further details).

The aim of this paper is to understand why some New Zealand firms in the professional services industries have been slow to embrace e-business technologies.

The adoption and diffusion of innovations

The ability to assess the opportunities to adopt or intensify the use of internet-based technologies (IBTs) will, according to Cohen and Levinthal (1989), depend primarily on the firm's endowment with human capital and its innovative activity. Besides the general tendency to adopt IBTs earlier or later in the diffusion process firms may differ in how they prioritise the innovation on their "must do" list. It is implied that productivity gains and scale economies may be concentrated on the use of existing business systems (that may or may not include the use of technology) that "work well" and, therefore, provide no incentive to "unlearn" and "relearn" using new technologies. Therefore, the decision to adopt IBTs will not only be governed by a "yes" or a "no" decision, but will be guided by a continuum which ranges from a situation where it is very easy to adopt the technology to one where it is very difficult. Factors such as awareness and understanding, availability, cost, technical compatibility and complexity of the technology may impact positively or negatively on the adoption process (Jeon *et al.*, 2004; Hollenstein and Wörter, 2004).

A review of the literature reveals five factors that seem to affect the "early" (Rogers, 1995) adoption of new technologies. These are:

- (1) negative mindsets regarding the technological/regulatory environment;
- (2) the nature of the service;
- (3) staff development/human resource issues;
- (4) market-orientation; and
- (5) the macro-environment (see also Kimberley and Evanisk, 1981; McCole *et al.*, 2001; Zhu *et al.*, 2002; Jeon *et al.*, 2004 for a more detailed discussion).

These factors form the basis for comparing adopters and non-adopters of e-business technologies in a sample of New Zealand professional service firms.

Negative mindsets regarding the technological/regulatory environment

Timmers (1999 as cited by Simpson and Docherty, 2004, p. 320) reported that ignorance surrounding technology fuels concerns about security, costs, legislation and interoperability. Darch and Lucas (2002 as cited by Simpson and Docherty, 2004, p. 320) reported that "secondary" perceived barriers to the adoption of e-commerce in Australian SMEs were inadequate telecommunications infrastructure, lack of trust and the relevance of e-commerce to their particular industry sector (food sector). Another Australian study conducted by Lawson *et al.* (2003, p. 266) suggested that the "barriers

to doing business online can be categorised as having a technical or a social perspective". Technical barriers include inadequacy of a telecommunication structure and security of transactions (Wai-Pun *et al.*, 1997 as cited by Lawson *et al.*, 2003, p. 266). Social barriers range from generally not trusting information technology (Crawford, 1998 as cited by Lawson *et al.*, 2003, p. 266), lack of knowledge about conducting business online and lack of IT skilled staff (Cameron and Clarke, 1996) through to lack of awareness about possible uses of the internet (Wai-Pun *et al.*, 1997 as cited by Lawson *et al.*, 2003, p. 266). Timmers (1999 as cited by Simpson and Docherty, 2004, p. 321) reported that in European large companies the main barriers to e-commerce adoption include lack of trust and security.

Firm size is considered an important factor that is used to explain adoption behaviour. Some studies have argued that organisational size has been a poor indicator with inconclusive and/or inconsistent findings relating to the adoption of "new" technologies (Brynjolfsson *et al.*, 1994; Grover and Teng, 1992). However, it is argued that larger firms have a higher propensity to adopt IBTs due to, for example, their ability to absorb risks related to technological development and preferential access to capital markets (Heres and Mante-Meijer, 2001; Weigelt, 2001). SMEs on the other hand have (among other things) less human, financial and technological resources and this may reduce their capacity to innovate (Raymond, 2001). Indeed an examination of small firm adoption patterns confirms that the smaller the enterprise the less likely they are to adopt IBTs (Durkan *et al.*, 2003). However, at this point it is not assumed that the factors that increase adoption among large firms are the same or only factors that decrease adoption levels among SMEs. We suggest that negative mindsets, specifically regarding the technological/regulatory environment may be an important barrier to e-commerce adoption in our sample of SMEs offering professional services. We set out to test this in a New Zealand context.

Nature of the service

The propensity to adopt IBTs will be higher where services are information intensive and are temporally and spatially transcendable (Matear *et al.*, 2000; Lovelock *et al.*, 1999). In some industries the nature of the service and the configuration of customer groups and suppliers will make buying and selling online a more natural solution than in others. Therefore, given the heterogeneity of services it is not surprising that adoption of IBTs is not homogenous in all service industries (Baumol, 1986).

Preissl (2003, p. 6) offers a typology based on four specific criteria relative to information intensity and its role in services that will affect the propensity to adopt IBTs for business purposes. The criteria are:

- services that hardly use IT (for example hairdresser, beautician);
- services that use IT in administrative support (for example restaurants, repair services);
- services that use IT to support core business functions (for example consultancy/financial services); and
- services that deal with IT as a core business activity (for example IT/software consultancy).

Services that fall within category one may be low or non-adopters of IBTs because of the high tangibility of the service offering. Category two services may have low/medium levels of adoption that will mostly be for internal efficiencies. Categories three and four type services are highly intangible and will, therefore, have greater propensity to adopt IBTs either to support core business functions or to enable the core business activity to be executed at the customer-firm interface.

It is suggested that firms that provide/produce output which is intangible or information intensive are far more likely to adopt internet-enabled technology for business purposes (Miles *et al.*, 1994; Peterson *et al.*, 1997; Porter, 2001; Preissl, 2003).

Staff development/human resources issues

Intense competition and rapid technological development are accelerating the change in skill requirements across almost all industries. The ability to learn continually and update skills is becoming more and more important (McCole *et al.*, 2001, p. 92). One of the key aspects SMEs must consider when embracing technological advances is the need to develop skills and competencies – technological changes demand a new set of skills. Rapid advancements require that companies possess skilled and competent employees in order to function; let alone compete (McCole *et al.*, 2001, p. 91).

A difficult task facing contemporary strategists is the alignment of employees into new systems, procedures and organisational structures which may involve the use or development of brand new technologies, or technologies new at an individual level. In order for firms to maintain market share, loyal customer bases and customer satisfaction, for example, the value of human assets should not be underestimated, nor should the value of updating skills and competencies through staff training (McCole *et al.*, 2001, p. 91).

Studies have shown that new information technology systems will only succeed if there is support from senior management and this remains true in smaller organisations (Daniel and Myers, 2000), where the propensity to adopt IBTs will be strongly associated with the importance placed on an e-business strategy within the firm (Stokes, 2000; Magnusson, 2001). Thus a deficient strategic orientation of IBT management and insufficient awareness of the potential of IBTs will impede adoption/non-adoption patterns (Chang *et al.*, 2003).

Market-orientation

According to Kohli and Jaworski (1990, p. 6) market orientation “is the organisation wide generation of market intelligence pertaining to current and future customer needs, dissemination of intelligence ... and organisation wide responsiveness to it”. The implications are that the firm will choose a type of strategy to enhance performance and execute that strategy via their marketing activities. The perceived business potential of the internet may be a reflection of the small firm’s market orientation and the need to compete on (and in) the same grounds as their bigger counterparts. Since the initial empirical research by Kohli and Jaworski (1990) and Narver and Slater (1990), a growing number of studies have supported the links between market-oriented behaviour and company performance, including recent studies in the services sector (Chang and Chen, 1998; Han *et al.*, 1998).

More market-oriented firms are likely to show greater responsiveness to IBTs to enable them to accommodate changing customer needs and to negate the effects of

competitor actions. Deploying such technologies should also allow companies to share market information throughout the firm and track their most profitable customers and products. Indeed previous research suggests that top performing service organisations/firms have higher levels of market-oriented behaviour (customer-orientation, competitor orientation, responsiveness and profit focus) and a higher propensity to establish a web presence (see Gray *et al.*, 1998a, b, 2000 for a fuller discussion). Drew (2003, p. 84) confirms that SMEs are placing e-business at the centre of their strategies where the driving force behind the adoption of e-business has been the opportunities for growth and the need to keep up with competition. Thus it is implied that market orientation will have an effect on whether or not small firms adopt IBTs and develop a web presence to facilitate and practice e-marketing.

Macro-environmental influences

Chong (2001, citing Fink and Kazakoff, 1997; Hart and Saunders, 1994; Iacovou *et al.*, 1995; Tan, 1998 (amongst others)) provides an excellent discussion of some of the external or macro-environment factors likely to influence the adoption of e-commerce. These include: environmental uncertainty; pressure from trading partners as well as other industry-specific competitive pressures; government influences; critical mass; issues related to infrastructure; and technological standards (see Chong, 2001, p. 5 for a fuller discussion).

Tornatsky and Fleischer (1990 as cited in Zhu *et al.*, 2002, p. 338) developed the technology-organisation-environment framework, which identified three aspects of a firm's context that influence the process by which it adopts and implements technological innovation. A firm's environment is one of these contexts and consists of: competitors; access to resources supplied by others; and dealings with government (Tornatsky and Fleischer, 1990, pp. 152-4 as cited in Zhu *et al.*, 2002, p. 338).

Experience tells us that technology adoption is primarily market-driven, either by competition or by the availability of new technologies and the search for new industrial applications (Rogers, 1995; Porter, 2001). In those markets where competition is intense, demand elasticities are expected to be higher because of the existence of close substitutes and this has the potential to drive innovative behaviours within the firm (Majumdar and Venkataraman, 1993). Low entry barriers or other market characteristics implying intensive competition (such as pace of change, use of technology in the industry) may also drive firms to adopt or intensify their use of IBTs.

The use of new technologies increases by time due to different reasons (Rogers, 1995 as cited in Cetindamar, 2001, p. 186). Cetindamar (2001) reported that there are at least three models of technology adoption:

One model of technology diffusion is the epidemic model, indicating that the lack of information available about the new technology can limit the diffusion of technology. Another model, the probit model, suggests that different firms adopt new technology at different times due to their differences in goals and abilities. An alternative model is related to density dependence that considers diffusion as the result of legitimation and competition (Cetindamar, 2001, pp. 186-7).

Of particular relevance to this research is the epidemic model of technology diffusion. The epidemic model of technology diffusion stresses information spillovers from users to non-users (Canepa and Stoneman, 2004). Thus a firm's propensity to adopt a technology at a certain point is positively influenced by the present level of adoption

and diffusion in the economy as a whole, or by the proportion of adopters in the industry or sector to which the specific firm is affiliated. Empirical studies confirm that epidemic effects are powerful drivers of technology adoption (Canepa and Stoneman, 2004; Bertschek and Fryges, 2002).

Research issue

Non-adoption of e-business strategies has wider macro-level ramifications where thus far research confirms that e-business in New Zealand has not reached the “critical mass” (Rogers, 1995) needed for the widespread adoption of e-business to take place (Gray *et al.*, 1999; Clark *et al.*, 2002, 2003; McCole and Ramsey, 2004). Diffusion of innovations theory (Rogers, 1995) allows comparisons to be made between early adopters and others, and for the purpose of this research enables an assessment to be made between adopters and non-adopters of e-business in New Zealand.

Two main questions guide this research:

- (1) What is the current state of e-business adoption in professional service firms in New Zealand?
- (2) To what extent do adopters and non-adopters differ in terms of:
 - negative mindset regarding technological/regulatory environment;
 - the nature of the service offered;
 - staff development;
 - degree of market-orientation; and
 - macro-environmental influences?

Methodology

Research context

The research is confined to the professional services sector in New Zealand. Professional service firms are information intensive and are, therefore, more likely to adopt internet-enabled technology for business purposes. The research is also confined to SMEs.

Data collection method

A questionnaire was developed that included measures of perceived barriers to e-business (Ramsey *et al.*, 2003, 2004; Simpson and Docherty, 2004); the nature of the service offered (Gray *et al.*, 1999); approaches to staff development (McCole *et al.*, 2001); degree of market-orientation (Gray *et al.*, 1999; Kohli and Jaworski, 1990); and impact of macro-environmental factors (Chong, 2001; Gray *et al.*, 1999; Ramsey *et al.*, 2003, 2004). Being taken from published research these constructs are considered to have construct validity. The constructs were measured using a Likert-type format ranging from strongly disagree to strongly agree. The questionnaire also included other demographic/firm characteristic items which were measured using nominal-type scales.

Sampling frame

A commercial data provider was asked to select a sample of 500 professional service providers based on the definition provided by Miles *et al.* (1994). Businesses were selected according to NZSIC codes, number of staff employed (less than 250 FTE), and

selected NZ cities where the majority of New Zealand SMEs are situated (Ministry of Economic Development, 2003). A stratified random sample was used to ensure a proportional representation of the different small-to-medium professional service firms across New Zealand. The final total (useable) response rate was approximately 30 per cent.

Data analysis

To check for non-response bias, the procedure suggested by Armstrong and Overton (1977 as cited by Baxter, 2005) was applied. Questionnaires were assembled in date order or receipt, having been date stamped as they arrived. Approximately equal numbers of questionnaires from the first few days after the mailing date and last few days on which there were responses were selected for testing. The *t*-test to check for significant difference between early and late responses was performed on a number of variables. No significant differences in means were found between the early and late groups at $p < 0.05$ on any of the variables tested. This indicates that non-response bias did not appear to be an issue.

Data was analysed using SPSS 12. For comparisons, the independent-samples *t*-test was used to analyse the data. This technique was chosen because it is acceptable to use it when groups are of unequal size. The *t*-test is also thought to be robust against moderate violations of the normality and homogeneity of variance assumptions (Corston and Colman, 2000). The non-parametric equivalent of the *t*-test (the Mann-Whitney *U*-test) was also carried out. This technique is thought to be less powerful than the *t*-test. Both tests, however, reported exactly the same results (in terms of significance), but only the more reliable *t*-test is reported (used to answer research question 2).

Results

Profile of responses and current state of e-business adoption

The majority of enterprises in the sample were involved in the legal profession, financial consulting services, management/business consulting, architectural/building services and publishing and printing. Although the majority of the businesses surveyed had at least one computer and modem to facilitate web-based communication (electronic mail), the percentage that had their own web site was much lower. For example, whereas all management/business consulting enterprises surveyed had web-based communication, only 41.2 per cent had a web site/presence. The same was found for legal enterprises: whereas 91.9 per cent of the legal enterprises surveyed had web-based communication, only 50 per cent had a web site/presence. The highest penetration of web site/presence was found in enterprises involved in research and development (100 per cent), publishing and printing (93.8 per cent), computer services/software development (90 per cent), "other" professional services (87.5 per cent), recruitment/employment services (80 per cent), and marketing and advertising (75 per cent). Interestingly, all enterprises involved in telecommunications, and engineer design/consulting all reported that they did not have a web site/presence even though they did have web-based communication. Overall 96.2 per cent of businesses had at least one computer and modem to facilitate web-based communication, but only 61.4 per cent had a web site/presence.

Reason for having a web site

The top five reasons were: to advertise and promote our firm's name and intent (57.2 per cent); to communicate specific product/service information (51.6 per cent); to enhance customer service (39.0 per cent); to communicate with customers and/or suppliers (37.7 per cent); and because competitors have one (25.8 per cent). Only 5.7 per cent of the sample cited to receive payments online as a main reason for having a web site/presence.

Internal integration

The vast majority of firms had no integration between their key internal systems and internet applications. Of the businesses that did have partial or complete integration, service/product database (34.2 per cent); customer database (27.1 per cent); and accounting systems (20 per cent) were more likely to be integrated with web site applications.

E-business benefits

The main benefits realised from having a web site/presence included (measured on a 5 point scale where 1 = strongly disagree to 5 = strongly agree): effective advertising and brand building (mean = 3.2); increased customer base (mean = 2.6); increased sales (mean = 2.6); cost savings (mean = 2.4); increased profits (mean = 2.3); finding new suppliers (mean = 1.7); and better purchasing terms (mean = 1.5). Closer inspection of these results suggest that the firms surveyed are not realising any benefits from having a web presence, other than it provides effective advertising and brand building. These findings would again suggest that the level of e-business sophistication within the firms surveyed is, at best, "primitive" (Chaffey *et al.*, 2000).

Differences between adopters and non-adopters

Firms that have adopted the internet for business purposes were termed adopters and those that did not adopt the internet for business purposes were termed non-adopters.

Table I compares adopters ($n = 96$) and non-adopters ($n = 62$) on items that were used to measure:

- (1) negative mindsets regarding the technological/regulatory environment;
- (2) the nature of the service offered;
- (3) staff development/human resource issues;
- (4) degree of market-orientation; and
- (5) macro-environmental influences.

Only significant differences between adopters and non-adopters are presented.

Negative mindsets regarding the technological/regulatory environment

Compared with adopters, non-adopters reported that: "we have no confidence in the regulatory/legal environment" ($t(148) = 3.92$, $p < 0.001$); "we do not trust the technology/security associated with the internet" ($t(146) = 4.40$, $p < 0.001$); and that "Internet-enabled business is highly risky for us and our customers" ($t(146) = 3.36$, $p < 0.01$). These results suggest that the cognitive style or attitudes of the key decision maker still acts as significant barrier to the adoption of e-business in some professional services firms (Reid, 1981; Bradley, 1984).

Item	Mean adopters	Mean non-adopters	Level of significance
<i>Negative mindsets regarding technological and regulatory environment*</i>			
No confidence in regulatory/legal environment	1.73	2.32	0.000
Do not trust technology	1.71	2.42	0.000
Highly risk for us and our customers	1.72	2.22	0.001
<i>Nature of service</i>			
Availability (one location – widely)	3.11	2.45	0.018
<i>Staff development/HR issues*</i>			
Staff development	2.70	2.34	0.014
Learning mechanisms	2.85	2.46	0.009
Staff capabilities	2.63	2.28	0.025
Management involvement	2.65	2.17	0.008
Not prepared to change	1.61	1.94	0.012
No future plans	2.02	2.66	0.001
<i>Market-orientation</i>			
Customer care	3.90	3.50	0.029
Creating customer value	4.10	3.76	0.035
Measure customer satisfaction	3.14	2.76	0.036
Recognising new market opportunities	3.09	2.49	0.002
Service innovation leaders	3.07	2.50	0.002
<i>Macro-environment</i>			
Buyer power	3.17	2.80	0.027
Competition cut throat	3.24	2.85	0.029
Customers look for new services	2.89	2.30	0.000
Customer preference for service change	3.06	2.56	0.003
New service ideas	3.39	2.81	0.002
Intelligence in technological change	3.55	2.81	0.000
Difficult to keep pace with rate of IT change	2.97	3.36	0.024

Table I.
Difference between adopters and non-adopters

Note: *Indicates that items were measured on a 4-point scale, where 1 = strongly disagree and 4 = strongly agree. All other measured on a 5-point scale, where 1 = strongly disagree and 5 = strongly agree

Nature of the service

Adopters differed from non-adopters on only 1 out of the 10 items that were used to measure the nature of the service. This is not surprising considering that all firms chosen for inclusion in this study were identified as being suitable candidates to adopt internet-enabled technology for business processes. The one item that non-adopters and adopters differed on was: “our service is only available in a single location – our service is widely available” ($t(154) = 2.41, p < 0.02$). Adopters reported that their service offering was more widely available than services offered by non-adopters. This may imply that firms that offer their services outside “local boundaries” find it necessary to establish e-business facilities so that they may respond to business opportunities from other areas – and hence take advantage of the spatial opportunities afforded by e-business.

Staff development/human resource issues

Adopters differed from non-adopters on 6 out of 12 items that were used to measure staff development/human resource issues. Compared with non-adopters, adopters reported that: "management seek to extend individual staff development in the use of information and communication technologies" ($t(138) = 2.50, p < 0.02$); "we have developed learning mechanisms to enabled/encourage a continuous learning process in our organisation" ($t(149) = 2.67, p < 0.01$); "there is a good fit between our staff capabilities and our e-business initiatives" ($t(148) = 2.27, p < 0.03$); and "management are highly involved in present and/or future e-business strategy" ($t(147) = 2.72, p < 0.01$). In addition, compared with adopters, non-adopters reported that: "we are not prepared to change our business processes or the way we work, to accommodate e-business" ($t(145) = 2.55, p < 0.02$); and that "management have no short or long term plans to implement an e-business strategy" ($t(145) = 2.55, p < 0.02$). At first glance these results may not be that surprising – after all one would assume that firms that have adopted e-business would have proper training programmes in place and that the implementation of an e-business strategy would be led from the top. The worrying result, however, is that some professional service firms, even though they may be ideal candidates to adopt the internet for business purposes, are not willing to change existing processes to accommodate e-business. Although it is not necessary for all firms to go online, attitudes like this may further hinder the New Zealand Government's EC Strategy goal to "... foster the highest quality e-commerce skills; to build innovation, technical and management capability... and to provide an environment that supports information and communication technology infrastructure development, business performance and increased economic well-being for individuals".

Market-orientation

Adopters differed from non-adopters on 5 out of 8 items that were used to measure market-orientation. Compared with non-adopters, adopters reported that: "we encourage customer comments and complaints because they help us do a better job" ($t(154) = 2.22, p < 0.05$); "we are always looking at ways to create customer value in our services" ($t(154) = 2.13, p < 0.05$); "we measure customer satisfaction on a regular basis" ($t(153) = 2.11, p < 0.05$); "compared to others in our industry, our firm is first to recognise and develop new markets" ($t(153) = 3.22, p < 0.01$); and that "compared to others in our industry, our firm tends to be first to market with innovative services/products" ($t(153) = 3.18, p < 0.01$). These results suggest that adopters tend to be more market-oriented and show greater responsiveness to internet-enabled technologies.

Macro-environment influences

Adopters differed from non-adopters on 7 out of 12 items that were used to measure macro-environmental influences. Compared with non-adopters, adopters reported that: "our customers have high bargaining power" ($t(151) = 2.24, p < 0.03$). Customers with high bargaining power can afford to "shop around" and thus adopters have a stronger need to have a web presence, as it enables them to compete with other service providers who may or may not be operating in the same geographic market. Compared with non-adopters, adopters also reported that: "competition in our service sector is cut

throat" ($t(154) = 2.21, p < 0.03$); "customers tend to look for new services all the time" ($t(154) = 3.72, p < 0.001$); "in our kind of business, customers' preference for service change quite a bit over time" ($t(154) = 3.03, p < 0.01$); "a large number of new service ideas have been made possible through technological breakthroughs in our service sector" ($t(154) = 3.18, p < 0.01$); and "we actively seek intelligence in technological changes in the environment that may affect our business" ($t(153) = 4.29, p < 0.001$). These results suggest that adopters are more aware of the forces in the external environment that are likely to affect current or future demand for their services.

Discussion

Current state of e-business adoption

The results suggest that although firms may be connected to a modem to facilitate web-based communication, they do not seem to be taking advantage of internet-enabled commerce for business purposes. The level of e-business sophistication in the majority of the firms surveyed tended to be "primitive" (Chaffey *et al.*, 2000). The study also suggests that although there does seem to be a rise in web site ownership since 2000 (Clark *et al.*, 2001), it is not matched by a growth in online activities (i.e. more "advanced" levels of sophistication).

Differences between adopters and non-adopters

In this study, firms that adopted the internet for business purposes were termed adopters and those that did not adopt the internet for business purposes were termed non-adopters. Adopters and non-adopters were compared on five dimensions:

- (1) negative mindsets regarding the technological/regulatory environment;
- (2) the nature of the service;
- (3) staff development/human resource issues;
- (4) market-orientation; and
- (5) the macro-environment.

The results of these comparisons are discussed next.

Negative mindsets regarding the technological/regulatory environment

Non-adopters appear to be more conservative and risk averse to implementing e-business. Providing SMEs with a low cost gateway to global markets may not be enough to merit initiation or further development of an e-business strategy. The implications are that non-adopting firms may be content with using traditional "ways of doing business" and see no incentive to change unless their negative mindset regarding trust, security and regulatory issues can be minimised.

Nature of the service

Not unexpectedly, firms whose service offering is widely available were more likely to adopt e-business than those whose service offering is only available in a single location. This implies that when a firm decides to concentrate on a local market, there is no need to adopt e-business. Potential clients could simply visit the physical office. Of course, there is nothing wrong with serving a local market. There is, however,

always the danger that the client may become aware of alternative suppliers that provide superior value propositions in other regions. This argument however only holds true for e-commerce activities. There is nothing preventing a firm who has decided to concentrate on a local market from adopting e-business practices – that is aligning organisational systems with IBTs to allow communication between debtors and creditors for example. As marketing becomes more of a battle based on information (rather than sales), the biggest challenge that professional marketers face both now and in the future is how to make the most of the online communications channel that is the internet. Consequently, marketers cannot afford to ignore the internet in their marketing activities, as “the web has become an inescapable part of every marketer’s life” (Uncles, 2001, p. 245).

Staff development

E-business activities require integrated business solutions and extensive managerial acumen for effective implementation. It also requires substantial investment in staff training in the use of new technologies (McCole *et al.*, 2001). Firms that have adopted internet-enabled technologies seem to support these assertions.

In general, there is a low level of e-business sophistication in the firms surveyed (Chaffey *et al.*, 2000; Venkatraman, 1994). The good news, however, is that adopters plan to further their levels of e-business sophistication in the future. The not-so-good news is that non-adopters are not prepared to change business processes to accommodate e-business ($t(145) = 2.55, p < 0.02$). They also reported that they had no plans to implement an e-business strategy in the future ($t(145) = 2.55, p < 0.02$).

The results suggest that there are educational and training issues that need to be addressed in both adopting firms and non-adopting firms. Adopting firms require more information and support and non-adopting firms need access to educational and development programmes that will let them make informed decisions about e-business.

New Zealand Trade and Enterprise seem to be addressing this need. They provide a (free) personalised step-by-step “roadmap” or guide to help firms with its e-business needs. They also provide a (free) one-on-one mentoring service allowing firms to move at their own pace and achieve their desired level of e-business. It is likely that many firms are unaware of this invaluable service provided by New Zealand Trade and Enterprise. Perhaps this research raises the need for New Zealand Trade and Enterprise to target their services more precisely at those businesses and sectors where there is huge potential for e-business development.

Market-orientation

Previous research suggested that top performing service organisations/firms have higher levels of market-oriented behaviour (customer-orientation, competitor orientation, responsiveness and profit focus) and a higher propensity to establish a web presence (Gray *et al.*, 1998a, b, 1999, 2000). This study provides support that more market-oriented firms show greater responsiveness to IBTs to enable them to accommodate changing customer needs and to negate the effects of competitor actions.

Macro-environmental influences

These results suggest that adopters are more aware of forces in the external environment that are likely to affect current or future demand for their services. This is

particularly alarming considering that both adopters and non-adopters in the study may be seen to have similar macro-environments. This suggests a lack of managerial foresight. It also suggests that adopters engage in regular environmental scanning, especially in the technological environments where new inventions can help reduce costs and deliver services more efficiently.

Conclusion

E-business uptake in New Zealand has been particularly slow compared with some of its major trading partners, including the US, UK, and Australia. The main objective of this study, therefore, was to answer the following research question: why have some New Zealand firms been slow to take advantage of e-business despite the many advantages that are associated with its adoption?

The main conclusion derived from this study is that a combination of factors are influential in determining a firm's current and future level of e-business adoption. These factors include: being able to understand potential e-business benefits; being able to respond to customer and competitor practices; being prepared to develop staff skills and knowledge of IBTs; and having a well justified and strategic orientation towards e-business. It is also suggested that while government bodies should continue to raise awareness and champion e-commerce; be informed about e-capability and provide help and support to those that need it, the onus for e-progress does not and should not solely rest with government bodies. In the final analysis choices about new technology and the exploitation of e-business opportunities must be led by the private sector. Thus individuals and business innovators must direct the development of their e-business strategies. Subsequently adopters must continue to extend their e-business capabilities and levels of sophistication. However, perhaps the biggest challenge that lies ahead is how to change the mindset of non-adopters and make them realise the benefits (and cost savings) that e-business can deliver.

Notes

1. A SME is a firm employing fewer than 250 full time equivalent employees (EU, 2003).
2. Strategy document available at: www.med.govt.nz/irdev/elcom/strategy/index.html.

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