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# The Impact of the Entrepreneurial Characteristics of the CEO on eCommerce Adoption in SMEs in New Zealand

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## ABSTRACT

This research attempted to investigate the impact of the CEO's characteristics on eCommerce (EC) adoption in small businesses (SMEs) in New Zealand (NZ) and accordingly, endeavoured to achieve three main objectives. Firstly, to introduce the entrepreneurial literature as a reference theory to EC research in SMEs. Secondly, to introduce results pertaining to the role of the CEO's innovativeness and his/her involvement in EC adoption in SMEs. The last objective attempted to introduce more features of the CEOs in this research and to investigate their impact on EC adoption. The research then addresses theoretical as well as professional significance and implications.

## BACKGROUND

In view of relevant New Zealand (NZ) literature, it was suggested that NZ firms (mostly small to medium-sized businesses (SMEs)) were early adopters of new technological innovations such as fax, EFTPOS, mobile phones, etc. (Deloitte, 2000; Huff et al., 2000; MOC, 1998; Peters & Paynter, 1999). However, as pointed by the same literature, the recent emergence of eCommerce (EC) in the 1990s seemed to be of a challenging nature to SMEs. Issues relating to EC adoption and diffusion seemed to be inconclusive and vague to this sector. Despite the reported enthusiasm and to the anticipated benefits from adopting EC, NZ SMEs seemed to be waiting for something to happen before embracing EC. It was suggested that with greater convergence in IT and critical mass and interdependence occur that NZ firms may use EC more strategically in business (Peters & Paynter, 1999). However, it should be emphasised here that while waiting, NZ SMEs may lose lots of the opportunities provided to early adopters.

In looking at the NZ economy, despite the high representation of SMEs in NZ, there exists a counter-argument pointing to a high degree of inter-subjective agreement that NZ culture is more oriented towards the non-entrepreneurial end of the continuum (Harper, 1992). The degree of interaction between specialist groups and business managers is much lower in NZ than in the US, Japan, France and Sweden (Harper, 1992). This is quite surprising given the small size of the NZ population. The emphasis on do-it-yourself and the jack-of-all-trades mentality limits the division of labour and specialisation in NZ. These cultural characteristics may superficially be interpreted as an indication of personal ingenuity and innovativeness. At a deeper level, they imply only low-level entrepreneurship and "pragmatic incremental tinkering" rather than the heroic high-level innovations that Schumpeter had in mind (see Harper, 1992: 40). However, research on features pertaining to the NZ business culture and entrepreneurship in NZ is rare.

The low entrepreneurial content of NZ culture may largely account for the recent poor performance of the NZ economy and may be the biggest obstacle lying in the path of realising NZ's potential. In comparison with other developed nations, NZ has a weaker scientific culture and generally, the division of labour has not been scientifically and extensively applied to management in NZ, largely because of the relative small size of most NZ businesses and the low levels of formal (management) education and specialist skills of most owner-managers of small busi-

nesses. These managers rarely have any functional specialisation: the manager is usually responsible for production, finance, sales, personnel, and purchasing (Harper, 1992). This literature points to the importance of addressing the role of the manager in SMEs.

Further, most of small business and entrepreneurship literature emphasises the role and the characteristics of the manager-owner as a product champion (Cragg & King, 1993; Poon & Swatman, 1998, 1997, 1999a, 1999b) and the entrepreneur as a change agent (Hailey, 1987). Cragg and King (1992, 1993) found that IT growth within NZ small businesses tends to take place in firms where the manager/owner (CEO) is enthusiastic about the technology. Poon and Swatman (1997, 1998, 1999a,b) found the same with respect to EC adoption in SMEs. The central role of the CEOs in SMEs has been suggested by other researchers as well. For example, Bili and Raymond (1993), Harrison et al. (1997), Jarvenpaa and Ives (1991), Thong (1999), Thong and Yap (1995, 1996) highlighted that the owner is usually the single point of authority in SMEs and tends not to share information with other members of the organisation. The CEO is the only one with access to the information needed to identify opportunities. Management support is crucial for innovation adoption success and for overcoming barriers and resistance to change. Hence, without this support it is hard to find champions in the organisation for new ideas (Teo et al., 1998). These features represent some of the aspects addressed next within the entrepreneurship literature in small businesses.

Therefore, this research was developed to focus on the CEO's role and his/her importance in EC adoption in NZ SMEs. However, what "individual" (CEO) variables to test or which one has the greatest impact on EC adoption in SMEs were the questions of this research and answered in the following section. For example, Cragg and King (1992) raised the need to explore the owner's characteristics in relation to IT success within SMEs.

## LITERATURE REVIEW

### CEO's Innovativeness and Involvement

The economist Schumpeter defined innovation as the implementation of new combinations in the commercial or industrial business sphere, where the implementation of new combinations is referred to as business, and the one implementing the new combinations is referred to as the entrepreneur (in Cuevas, 1994: 81). This definition is essential to this research in linking EC (as a technological innovation opportunity (Timmons, 1994)) with the business and the entrepreneur. In his review of the entrepreneurial theories, Cuevas (1994) concluded that there is not one single concept of the entrepreneur. He provided three fundamental components of the entrepreneurial function that are of essence to the understanding of entrepreneurship:

- i. The capitalist function (e.g. supplier of capital), limited to primary industry in the sphere of productive activity;
- ii. The directional or managerial function when defining the role of the entrepreneur;

- iii. Other schools (other than i & ii) that share a slight degree of formalisation.

Driven by the third component, Cuevas (1994) introduced the term “booster” or “energiser” as the main aspect of the entrepreneurial function. This better reflects the permanent nature of the entrepreneur in not just initiating a project (point i above) but in keeping it alive until its completion. Thus, the role of the entrepreneur does not necessarily coincide with the role of the corporate founder. The entrepreneur may function as a manager but this is not his/her true essence. Driven by Schumpeter’s doctrine, Carton et al. (1998) endorsed the findings of Cuevas’s study in highlighting the importance of the entrepreneur involvement. Further, the authors showed that Schumpeter did not limit his definition of entrepreneurship to the creation of new ventures only in the pursuit of discontinuous opportunity, but allowed for entrepreneurship to exist within an established organisation such as when pursuing a project. Thus, if pursuing a discontinuous opportunity such as introducing EC in the firm is considered an entrepreneurial act, then this emphasises the importance of the entrepreneur role. It does so not only on the basis of his/her characteristics, but also on the basis of his/her involvement in guaranteeing the success of the initiative.

In distinguishing entrepreneurship from the ongoing management of an organisation, Carton et al. (1998) insisted on pursuing the “discontinuous opportunity” until the stage where it is either able to sustain itself or fail. Whether the opportunity is providing tangible or intangible returns is irrelevant (this is the main characteristic of entrepreneurship). Thus, incremental changes in the workplace are not considered an entrepreneurial activity. EC provides different and new opportunities and benefits (tangible and intangible) to businesses including SMEs. Features of the Internet such as its openness, unified standards, interoperability and its global interconnectedness provide unprecedented opportunities to SMEs to network, to expand in scope and to increase their market share.

However, recent EC research in SMEs revealed that the real benefits of EC might not materialise in the short term (not self-sustaining) (Poon & Swatman, 1997, 1998, 1999a,b). This further emphasises the importance of the entrepreneurial-spirit in order for EC to succeed in SMEs. Timmons (1994) concluded that the founder is one of the central forces driving the entrepreneurial process, even in the high innovative technological ventures. However, the quality of the team is necessary for the success and/or survival of the venture.

In support of the entrepreneurship and the entrepreneurial literature, the manager’s innovativeness and the manager’s IT knowledge emerge as two prominent factors in the innovation adoption literature in SMEs (Table 1). However, Poon and Swatman (1998) highlighted the importance of the following two main determinants on EC success in small business (discussed next):

- i. Management involvement. Most of the participants in their study were either owners or managers who had direct involvement in adopting the Internet and using it for business;
- ii. Entrepreneurship (innovativeness). The authors observed the entrepreneurship characteristics among their Internet-active users: always search for change, respond to it, and exploit it as an opportunity, ability to create, innovate, bear risk, manage and achieve targets.

Poon and Swatman (1997, 1998, 1999a) pointed to the manager’s role in their EC study, where they found that direct management involvement in the different EC initiatives to be the norm. Although the managers of SMEs lack formal IT qualifications and training, they are champions in adopting EC specifically, in micro businesses where the sole decision-maker is the director of the business.

Thong (1999) and Thong and Yap (1995) explored the CEO’s IT knowledge and innovativeness in the IT adoption literature on small businesses. They found CEOs determining adoption and extent of adoption as well. Despite the apparent agreement between Thong

(1999), Thong and Yap (1995) and Poon and Swatman (1998) about the entrepreneurial role, Poon and Swatman emphasised the manager’s involvement as being more vital to EC success than the IT knowledge. They indicated a lack of the formal IT or EC training among the managers of the different SMEs. This finding has been suggested by recent EC research in small businesses in NZ (Deloitte, 2000; PWHC, 1999). Cragg and King (1993) found that the owner’s low level of knowledge about IT discourages other members in the firm from exploring opportunities with IT. A few enthusiastic managers reported having more interest in IT and in growing IT use within their firms. Peters and Paynter (1999), however, pointed to the lack of senior management involvement with computerisation and to the low positioning of the IT function in the firm. This further highlights the importance of the manager’s involvement. A recent large study found that management’s depth of commitment to EC-transformation is the most critical success factor (Weston, 2000). As a result the manager’s involvement becomes more vital to this research as a potential determinant of EC in SMEs than the manager’s IT or EC knowledge.

Thus, CEO’s involvement in EC initiatives in their organisations is crucial for the following reasons:

- i. Involved managers would know more about the EC project in relation to employees, vendors, consultants and execution. Hence they provide the faster decisions necessary for the smooth execution of the EC project.
- ii. Such involvement provides the necessary motivation and empowerment for both internal and external parties.
- iii. Managers are needed to lead the challenging task of transforming to the EC arena in line with the new technological requirements.

#### CEO’s Characteristics

What distinguishes an entrepreneur from a non-entrepreneur has been the subject of a large debate in the entrepreneurship literature (Cuevas, 1994; Carton et al., 1998; Timmons, 1994). In addition to the above individual features highlighted by Rogers (1995) and Cragg and King (1992), Carton et al. (1998) found that considerable attention had been given to the traits and characteristics that make a person act entrepreneurially. The traits most frequently cited as being characteristic of successful entrepreneurs include the desire for independence, locus of control, risk-taking propensity, need for achievement and credible role models. These features have been suggested to have a greater influence on new venture formation, e.g. antecedents to entrepreneurship. On the other hand, individual characteristics such as education, age, experience and psychological traits have been found to influence innovation adoption strongly (Rogers, 1995). Cragg and King (1992) raised the need to explore features like the owner’s involvement with IT, role in the firm as owner-controller, age (younger managers have better experience with IT than older managers) and motivations (growth, job satisfaction or money) are important.

#### RESEARCH METHODOLOGY

This research is part of an ongoing research which investigated different determinants of EC adoption in NZ SMEs. This research focused on the characteristics of the CEO and his/her role on EC adoption in SMEs. Part of a large survey research (Authors, 2004), the researcher investigated the role of the CEO’s innovativeness and hi/her involvement on EC adoption in NZ SMEs. These results are discussed in the following section. The research then complements these results with further analysis of different characteristics of the CEOs in the surveyed sample. These additional characteristics were highlighted as important determinants in recent research (Cragg & King, 1992; Rogers, 1995) and were hypothesised to play a significant role in supplementing the earlier results and in shedding more light into the adoption criteria of EC in NZ SMEs.

## RESEARCH ANALYSIS AND RESULTS

### CEO's Innovativeness vs. CEO's Involvement

This research found that the CEO's innovativeness was statistically significant on EC adoption and hence, appeared as a significant differentiator between adopters and non-adopters of EC in NZ SMEs. Thong (1999) and Thong and Yap (1996) found that CEO's innovativeness was statistically significant in the case of IT adoption and statistically insignificant in the case of extended (adopting different and more IT) IT adoption. Thong (1999) confined the importance of this factor to the adoption stage only and indicated that the CEO's innovativeness stops there and that it was left to other people in the organisation (i.e., IT staff) to make more IT adoption decisions. However, the findings in this research supported the findings of earlier IT adoption research in SMEs but not for the extent of IT adoption (Thong, 1999; Thong & Yap, 1995, 1996), as it appeared that the sampled NZ SMEs perceived the CEO's innovativeness to be important as well in the case of extended adoption of EC. This research supported the view that the CEO's innovativeness was essential for the successful adoption of EC in SMEs in NZ. Aspects of the innovative CEO included the capability of the CEO to deal with different ideas at the same time, stimulating, inspiring, and always having fresh perspectives of different impending issues in his or her organisation. These features were evident of the CEO's innovativeness and capability in introducing new ideas and innovations.

In looking at the CEO's involvement (the CEO's involvement in the adoption and implementation of EC and in leading and managing the changes needed as a consequence of the adoption decision of EC) – this research found that the CEO's involvement was statistically insignificant. In line with the literature interpretation of this insignificance (Thong, 1999; Thong & Yap, 1995, 1996), it was suggested that the sampled SMEs retained similar views about the CEO's involvement in EC adoption, leading to its insignificance as a differentiator between adopters and non-adopters of EC. Peters and Paynter (1999) reported the lack of senior management involvement in computerisation and the low positioning of IT function in the firm in NZ.

### CEO's Characteristics and EC Adoption

In line with the second objective of this research and due to the importance of the CEO's characteristics with respect to EC adoption, this section provides different statistical information about the features of the NZ CEOs (Tables 1, 2) in relation to: (1) the adoption of Internet and email and (2) any of the following EC infrastructure-technologies (ECIT): Intranet, Extranet/VPN, Internet-EDI and Web sites. This section also attempted to shed more light into the significance and the insignificance of the factors highlighted in the survey research above (CEO's innovativeness and involvement) (Authors, 2004).

From Table 1(a), it was clear that most of the CEOs adopting Internet and email (external email) (85.6%) were owners (or one of the owners) of the business. The majority of those CEOs were males (92%) in comparison with 10 adopting female-CEOs (8%) (Table 1(b)). Non-adopters were most likely to be men. Most of the adopting CEOs were belonging to the European NZers category (84%) (the three non-adopters came from this category as well) followed by Europeans (6.4%), Asian (4%), other ethnicities (3.2%) and lastly by Maori CEOs (2.4%) (Table 1(c)). These results are comparable to the overall business community in NZ: European NZers2 (72%), Europeans (16.6%), Maoris (15.1%), Pacific Islanders (5.8%) and Asians (5%) (Cameron & Massey, 1999). For example, the Government is interested in increasing the number of Maori businesses in the marketplace (MOED, 2000). According to the limited number of Maori managers in the sample (2.3%), it could be suggested here that their share in the marketplace was minimal. The dominant age category was the CEOs belonging to the "above 45 years" category (35.2%) (the three non-adopters came from this category as well) followed by "41-45 years old" (19.2%), "36-40 years old" (15.2%) (Table 1(d)). Young age categories were all adopters. It is worth noting here that non-adopters were likely to come from the male

category, European NZers and belong to the "above 45 years old" category. This fact could be used to justify the apparent significance of the CEO's innovativeness in the "starters" category as a differentiator between some old-age adopter and non-adopter European NZer male CEOs with independent businesses (Table 1(e)). On the other hand, the same fact could be used to explain the insignificance of the CEO's involvement factor in the research model across the same category, European NZer male CEOs with independent businesses (Table 1(e)). CEO's involvement was not significant in the research model and hence, the views of both adopters and non-adopters did not differ significantly with respect to this factor.

In looking at vertical linkages (Table 1(e)), it was observed that non-adopters (3 SMEs) were more likely to be independent SMEs. The majority of adopters of Internet and email were not linking with any overseas or large corporations (74.4%) and those were likely to hold a university graduate degrees (Bachelor) followed by high-schoolers, Diplomas and certificates (Tables 1(f,g)). There was a significant difference between the SMEs belonging and not-belonging to large or overseas companies with respect to CEO education level,  $p = 0.002 < 0.01$  (Pearson Chi-Square) (Table 1(g)). However, most of high-schoolers as well as university degree holders came from those independent SMEs (Table 1(g)) and those were most likely to belong to European NZers (Tables 1(h,i)). There was a significant difference between SMEs belonging or not-belonging to large or overseas companies with respect to CEO's ethnicity,  $p = 0.02 < 0.05$  (Pearson Chi-Square) (Table 1(h)). Thus, the ethnicity and the education level of the CEO played a significant role in influencing Internet and email adoption – in addition to the above justification, this fact could be used to explain the above significance of the CEO's innovativeness across the category, European NZer male CEOs, above 45 years old with independent businesses.

The omnicence of high-schoolers and bachelor degree-holders amongst the adopting CEOs represents an interesting finding in this research. Most of high-schoolers came from the micro SMEs (5 or fewer FTEs) while most of bachelor degree holders came from micro and medium-sized enterprises (6-19 FTEs) (Table 1(i)). These apparent differences could be justified on the basis of the business type where most micro businesses belong to wholesale, manufacturing and IT/Communications industries (Table 1(j)). The same argument applies to medium-sized businesses as well. The former two categories do not require high qualifications. However, working in the IT/Communication industry is more likely to require a university qualification (e.g., programmer, developer, business/system analyst, hardware engineer, etc.) (Table 1(k)). There was a significant difference between CEO's education level and business type in the sample,  $p = .006 < 0.01$  (Pearson Chi-Square) (Table 1(k)). Thus, ethnicity and education level of the CEO and the business type played a significant role in influencing Internet and email adoption in this research.

In summary, it could be suggested here that education and business-type was the main differentiating features between adopting and non-adopting European NZ male CEOs, above 45 years old and with independent businesses with respect to Internet and email adoption.

The "adopters" categories (Table 2) followed similar adoption patterns to the "starters" category. This was expected in this research as most "adopters" were already adopting Internet connections and email accounts. However, there was a considerable rejection rate of ECIT amongst owner-CEOs (24%) (Table 2(a)) and those were most probably to be males (Table 2(b)), European NZers (Table 2(c)). However, there was a considerable high adoption rate amongst European NZ (Table 2(c)) as well. High adopters as well as non-adopters were more likely to be old CEOs.

The difference between adopters and non-adopters of any of the ECIT was significant across the different ethnicities of the CEOs in the sample,  $p = 0.09 < 0.1$  (Table 2(c)) and hence, ethnicity of the CEO plays a significant role in ECIT adoption as highlighted earlier. The same specifics highlighted above with respect to CEO's characteristics (age, gender, ethnicity, qualification, part of large/overseas company) apply here as well.

Table 1. CEO's Characteristics of the Adopters of Internet and Email

Table 1(a). Manager-Owner vs. Internet and Email Adoption

		Manager is owner		Total
		yes	No	
Adopt Internet	"No"	Count 2	1	3
		% of Total 1.6%	.8%	2.4%
"Yes"	Count	107	15	122
	% of Total	85.6%	12.0%	97.6%
Total	Count	109	16	125
	% of Total	87.2%	12.8%	100.0%

Table 1(b). CEO's Gender vs. Internet and Email Adoption

		Gender of CEO		Total
		Male	Female	
Adopt Internet	"No"	Count 3		3
		% of Total 2.4%		2.4%
"Yes"	Count	112	10	122
	% of Total	89.6%	8.0%	97.6%
Total	Count	115	10	125
	% of Total	92.0%	8.0%	100.0%

Table 1(c). CEO's Ethnicity vs. Internet and Email Adoption

		Ethnicity of CEO					Total
		European New Zealander	Maori	Asian	European	"Others"	
Adopt Internet	"No"	Count 3					3
		% of Total 2.4%					2.4%
"Yes"	Count	102	3	5	8	4	122
	% of Total	81.6%	2.4%	4.0%	6.4%	3.2%	97.6%
Total	Count	105	3	5	8	4	125
	% of Total	84.0%	2.4%	4.0%	6.4%	3.2%	100.0%

**DISCUSSION AND CONCLUSIONS**

The CEO's innovativeness appeared more consistently as a differentiator between adopters and non-adopters than the CEO's involvement as discussed above. This further emphasises the role of the innovative CEO in adopting new ideas and innovations such as EC. On the other hand, due to different inherent constraints in the SME's environment (resource, capability, busy-nature, scope), the CEO is expected to perform different tasks in his/her organisation and indeed to be involved in the different aspects of the business (Bili & Raymond, 1993). Such features

Table 1(d). CEO's Age vs. Internet and Email Adoption

		Age of CEO when manager					Total
		25 to 30	31 to 35	36 to 40	41 to 45	Above 45	
Adopt Internet	"No"	Count				3	3
		% of Total				2.4%	2.4%
"Yes"	Count	18	17	19	24	44	122
	% of Total	14.4%	13.6%	15.2%	19.2%	35.2%	97.6%
Total	Count	18	17	19	24	47	125
	% of Total	14.4%	13.6%	15.2%	19.2%	37.6%	100.0%

Table 1(e). Vertical Linkages vs. Internet and Email Adoption

		Part of large/overseas com.		Total
		yes	No	
Adopt Internet	"No"	Count	3	3
		% of Total	2.4%	2.4%
"Yes"	Count	29	93	122
	% of Total	23.2%	74.4%	97.6%
Total	Count	29	96	125
	% of Total	23.2%	76.8%	100.0%

Table 1(f). CEO's Qualification vs. Internet and Email Adoption

		CEO education								Total
		Primary-Intermediate	High-School	Bursary	Certificate	Diploma	University Bachelor	Master and Above	"Don't know"	
Adopt Internet	"No"	Count	1	1	1					3
	% of Total		.8%	.8%	.8%					2.5%
"Yes"	Count	1	29	7	16	20	36	4	4	117
	% of Total	.8%	24.2%	5.8%	13.3%	16.7%	30.0%	3.3%	3.3%	97.5%
Total	Count	1	29	7	17	21	37	4	4	120
	% of Total	.8%	24.2%	5.8%	14.2%	17.5%	30.8%	3.3%	3.3%	100.0%

in general and the "busy-nature" specifically may explain the statistical insignificance of the CEO's involvement in that the CEOs would not be involved predominantly in implementing EC and hence, confining his/her role to his/her innovativeness in introducing EC in their organisations only. This justification may suggest the weakness of the EC initiatives in NZ SMEs, as it implies that the CEO was not involved in furthering EC in their organisations. The uniqueness of the NZ perspective might be used here to further suggest this weakness – to the following facts:

- i. 84 percent of the NZ sector is dominated by micro-enterprises employing up to five employees only (MOED, 2000);

Table 1(g). CEO's Qualification vs. Vertical Linkages (P=0.002 < 0.01)

CEO education	Primary-Intermediate	Count	Part of large/overseas com.		Total
			Yes	No	
				1	1
		% of Total		.8%	.8%
	High-Sschool	Count	4	25	29
		% of Total	3.3%	20.8%	24.2%
	Bursary	Count	4	3	7
		% of Total	3.3%	2.5%	5.8%
	Certificate	Count	2	15	17
		% of Total	1.7%	12.5%	14.2%
	Diploma	Count	7	14	21
		% of Total	5.8%	11.7%	17.5%
	University Bachelor	Count	5	32	37
		% of Total	4.2%	26.7%	30.8%
	Master and above	Count	3	1	4
		% of Total	2.5%	.8%	3.3%
	"Don't know"	Count	3	1	4
		% of Total	2.5%	.8%	3.3%
Total		Count	28	92	120
		% of Total	23.3%	76.7%	100.0%

Table 1(h). CEO's Ethnicity vs. Vertical Linkages (p= 0.02 < 0.05)

Ethnicity of CEO	European New Zealar	Count	Part of large/overseas com.		Total
			Yes	No	
			22	83	105
		% of Total	17.7%	66.9%	84.7%
	Māori	Count		3	3
		% of Total		2.4%	2.4%
	Asian	Count	3	2	5
		% of Total	2.4%	1.6%	4.0%
	European	Count	1	6	7
		% of Total	.8%	4.8%	5.6%
	"Others"	Count	3	1	4
		% of Total	2.4%	.8%	3.2%
Total		Count	29	95	124
		% of Total	23.4%	76.6%	100.0%

- ii. from the country's geographical isolation and from the time differences which separate NZ from the northern hemisphere.
- iii. The population in NZ is relatively small (3.82 million) with more than one third of the population residing in the Auckland region (1,158,891) (NZStat, 2001).

However, more research needs to be implemented in order to investigate and to confirm this weakness. It should be pointed here that although recent EC research in SMEs highlighted the importance of the CEO's involvement as a factor in EC success (Poon & Swatman, 1998; 1999a), none of this research examined this issue empirically or in the context of identifying differences between adopters and non-adopters.

In line with the second objective which examined the features of the different CEOs in the survey sample, it was reported that the CEOs were

Table 1(i). CEO's Qualification vs. SME's Size

CEO education	Primary-Inteme	Count	FTEs				Total
			5 or fewer	6 to 19	20 to 50	50 to 100	
			1				1
		% of Tot:	.8%				.8%
	High-Sschool	Count	14	12	3		29
		% of Tot:	1.7%	10.0%	2.5%		24.2%
	Bursary	Count	2	4	1		7
		% of Tot:	1.7%	3.3%	.8%		5.8%
	Certificate	Count	9	5	3		17
		% of Tot:	7.5%	4.2%	2.5%		14.2%
	Diploma	Count	13	7	1		21
		% of Tot:	0.8%	5.8%	.8%		17.5%
	University Bach	Count	16	16	4	1	37
		% of Tot:	3.3%	13.3%	3.3%	.8%	30.8%
	Master and above	Count	4				4
		% of Tot:	3.3%				3.3%
	"Don't know"	Count	1	2		1	4
		% of Tot:	.8%	1.7%		.8%	3.3%
Total		Count	60	46	12	2	120
		% of Tot:	0.0%	38.3%	10.0%	1.7%	00.0%

most likely to belong to the European NZers ethnic group, owners of independent businesses (not linked to large or overseas companies), males, above 45 years old, likely to hold bachelor degrees or high-school certificates. The dominance of this age category could raise some concerns about the viability of these businesses in the long term. It was suggested in this research that the CEO's ethnicity and his/her education level and the business type played an important role in influencing EC adoption in this research. However, more research is needed to further expand/confirm these suggestions. Other significant differences suggested that younger CEOs were more likely to adopt different EC technologies than older CEOs. Accordingly, fulfilling the second objective has assisted in complementing the multivariate analysis in the first objective by providing further analysis of the CEO's characteristics and at the same time, allowed for more interpretations and justifications to the significance of the CEO's innovativeness and to the insignificance of the CEO's involvement.

Achieving the research objectives is of significant importance to professionals, policymakers and to academicians in NZ and elsewhere interested in looking at distinguishing features of adopting and non-adopting CEOs in SMEs. Professionals could customise their targeting strategies (e.g., segmentation, marketing, etc.) to appeal to the CEOs in SMEs. Policymakers could utilise the research findings to develop EC policies and guidelines taking into consideration the unique characteristics of CEOs in this research in order to increase EC adoption and penetration in SMEs.

In discussing the research limitations, the dominance of the European NZer male owner-CEOs, above 45 years old and with independent businesses in the sample meant that the research results were more focused on this category. These results suggested the uniqueness of the adoption context of SMEs in NZ. However, it would be interesting to implement similar studies across other regions in NZ or elsewhere and compare/contrast their findings with this research's results. Although

Table 1(j). Business Type vs. SME's Size

Business type		FTEs				Total
		5 or fewer	6 to 19	20 to 50	50 to 100	
Manufacturing	Count	10	12	3		25
	% of Total	8.0%	9.6%	2.4%		20.0%
Construction	Count	4	4	1		9
	% of Total	3.2%	3.2%	.8%		7.2%
Primary	Count	1	1			2
	% of Total	.8%	.8%			1.6%
Wholesale	Count	14	11	4		29
	% of Total	11.2%	8.8%	3.2%		23.2%
Retail	Count	6	1			7
	% of Total	4.8%	.8%			5.6%
Business services	Count	9	7	1		17
	% of Total	7.2%	5.6%	.8%		13.6%
Personal services	Count		2		1	3
	% of Total		1.6%		.8%	2.4%
Finance / Insurance	Count	3		1		4
	% of Total	2.4%		.8%		3.2%
Internet services	Count	3				3
	% of Total	2.4%				2.4%
IT/Communications	Count	10	8	2	1	21
	% of Total	8.0%	6.4%	1.6%	.8%	16.8%
"Others"	Count	1	4			5
	% of Total	.8%	3.2%			4.0%
Total	Count	61	50	12	2	125
	% of Total	48.8%	40.0%	9.6%	1.6%	100.0%

Table 1(k). CEO's Qualification vs. Business Type

Business type		CEO education							Total
		Primary-Intermediate	High School	Bursary Certificate	Diploma	University Bachelor	Master and above	"Don't know"	
Manufacturing	Count	6	1	7	5	5			24
	% of Total	5.0%	.8%	5.8%	4.2%	4.2%			20.0%
Construction	Count	1	1	4	1	1			8
	% of Total	.8%	.8%	3.3%	.8%	.8%			6.7%
Primary	Count				1	1			2
	% of Total				.8%	.8%			1.7%
Wholesale	Count	7	2	4	5	7		2	27
	% of Total	5.8%	1.7%	3.3%	4.2%	5.8%		1.7%	22.5%
Retail	Count	2	1	1	1	2			7
	% of Total	1.7%	.8%	.8%	.8%	1.7%			5.8%
Business services	Count	8	1		1	7			17
	% of Total	6.7%	.8%		.8%	5.8%			14.2%
Personal services	Count					3			3
	% of Total					2.5%			2.5%
Finance / Insurance	Count	1			1	2			4
	% of Total	.8%			.8%	1.7%			3.3%
Internet services	Count	1			1	1			3
	% of Total	.8%			.8%	.8%			2.5%
IT/Communications	Count	4	1	3	3	6	2	1	20
	% of Total	3.3%	.8%	2.5%	2.5%	5.0%	1.7%	.8%	16.7%
"Others"	Count	1		1		2		1	5
	% of Total	.8%		.8%		1.7%		.8%	4.2%
Total	Count	1	29	7	17	21	37	4	120
	% of Total	.8%	24.2%	5.8%	14.2%	17.5%	30.8%	3.3%	100.0%

Table 2. CEO's Characteristics in the "Adopters" Category

Table 2(a). Manager-Owner vs. ECIT Adoption

Any EC infrastruc		Manager is owner		Total
		yes	No	
		"No"	Count	
% of Total	24.0%		2.4%	26.4%
"Yes"	Count	79	13	92
	% of Total	63.2%	10.4%	73.6%
Total	Count	109	16	125
	% of Total	87.2%	12.8%	100.0%

Table 2(b). CEO's Gender vs. ECIT Adoption

Any EC infrastruc		Gender of CEO		Total
		Male	Female	
		"No"	Count	
% of Total	23.2%		3.2%	26.4%
"Yes"	Count	86	6	92
	% of Total	68.8%	4.8%	73.6%
Total	Count	115	10	125
	% of Total	92.0%	8.0%	100.0%

Table 2(c). CEO's Ethnicity vs. ECIT Adoption (p=.09 < 0.1)

Any EC infrastruc		Ethnicity of CEO					Total
		European New Zealander	Maori	Asian	European	"Others"	
		"No"	Count	25	1	4	
% of Total	20.0%		.8%	3.2%	1.6%	.8%	26.4%
"Yes"	Count	80	2	1	6	3	92
	% of Total	64.0%	1.6%	.8%	4.8%	2.4%	73.6%
Total	Count	105	3	5	8	4	125
	% of Total	84.0%	2.4%	4.0%	6.4%	3.2%	100.0%

Table 2(d). CEO's Age vs. ECIT Adoption

		Age of CEO when manager					Total	
		25 to 30	31 to 35	36 to 40	41 to 45	Above 45		
Any EC infrastructure	"No"	Count	5	4	4	5	15	33
		% of Total	4.0%	3.2%	3.2%	4.0%	12.0%	26.4%
	"Yes"	Count	13	13	15	19	32	92
		% of Total	10.4%	10.4%	12.0%	15.2%	25.6%	73.6%
Total	Count	18	17	19	24	47	125	
	% of Total	14.4%	13.6%	15.2%	19.2%	37.6%	100.0%	

Table 2(e). Vertical Linkages vs. ECIT Adoption

		Part of large/overseas com.		Total	
		Yes	No		
Any EC infrastructure	"No"	Count	7	26	33
		% of Total	5.6%	20.8%	26.4%
	"Yes"	Count	22	70	92
		% of Total	17.6%	56.0%	73.6%
Total	Count	29	96	125	
	% of Total	23.2%	76.8%	100.0%	

Table 2(f). CEO's Qualifications vs. ECIT Adoption

		CEO education							Total
		Primary/Intermediate	High School	Bursary	Certificate	Diploma	University Bachelor	Master and above	
Count		8	2	5	6	9	1	1	32
	% of Tot	6.7%	1.7%	4.2%	5.0%	7.5%	.8%	.8%	26.7%
Count		1	21	5	12	15	28	3	88
	% of Tot	.8%	17.5%	4.2%	10.0%	12.5%	23.3%	2.5%	73.3%
Count		1	29	7	17	21	37	4	120
	% of Tot	.8%	24.2%	5.8%	14.2%	17.5%	30.8%	3.3%	100.0%

the selected random sample for this research was a representative sample of the North Shore City part of the Auckland Region, the limited participation of SMEs involved with overseas markets and the scant involvement of different ethnicities in this research necessitates a look at other macro forces (political, economical, social and technological). It could be rationalised here that business type could influence the adoption decision of EC but due to the emergence of the education-level as a differentiating factor points again to the same concerns raised by

Harper (1992) earlier. Recent survey research found that NZ managers rated highly on the performance orientation measure but were rated highly on uncertainty avoidance (cannot manage high responsibilities alone) and that diplomatic and administratively competent were rated much lower than other countries (Kennedy, 2000). Such risk avoidance may deter the CEO's from exploring the multifaceted perspectives of EC. NZ managers place low emphasis on future-oriented behaviour such as planning, investing in future and delaying gratification where most of the EC opportunities exist (Kennedy, 2000). Confining the CEO's role to his/her innovativeness in introducing EC and his/her lack of involvement in the EC project suggested an incomplete adoption cycle, as discussed in the entrepreneurial literature above which stressed the importance of the CEO's innovativeness and involvement in pursuing the discontinuous opportunity (i.e., EC). More work is needed to investigate the depth of the EC phenomenon in SMEs in NZ before concluding its success or failure.

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**ENDNOTES**

- <sup>1</sup> The indigenous people of New Zealand  
<sup>2</sup> European descent

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