Canadian Approaches to E-Business Implementation

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Abstract

As Web-based business nears the decade mark, it is appropriate to take stock of its progress and the degree to which it has met or fallen short of predictions. This paper examines the extent to which companies have followed the advice of experts when it comes to designing an organizational structure for their e-business initiatives. It compares the prevalence of centralized versus business unit level decision-making in Canadian companies with e-business experience. It also explores who is given responsibility for application development, back-end integration, and infrastructure maintenance. The data demonstrate that use of independent contractors has increased. However, outsourcing in general is less prevalent than predicted and implementation driven by business units, rare. Furthermore, the practices of companies with well-established initiatives differ significantly from those of the less experienced, offering important lessons for newcomers to e-business.

Résumé

Etant donné que le commerce basé sur la toile a presque dix ans, il est temps d'analyser son progrès et l'écart de résultat par rapport aux prédictions. La présente étude analyse quel a été le niveau de suivi des conseils d'expert par les entreprises en ce qui concerne la programmation des structures de mise en œuvre de leurs projets de commerce électronique. Elle compare la position dominante des décisions prises au niveau centralisée sur celles prises au niveau de la division spécialisée chez les entreprises canadiennes ayant une expérience en commerce électronique. Elle fait apparaître également à qui a été confié la responsabilité du développement des logiciels, de l'étape finale de l'intégration et de l'entretien de l'infrastructure. Les données démontrent que l'emploi des entrepreneurs indépendants a augmenté. Cependant, la sous-traitance n'est en général pas aussi forte que prévue et le développement assuré par les divisions spécialisées reste faible. En outre, la pratique des entreprises ayant des activités bien établies se distingue considérablement de celle qui ont moins d'expérience, offrant ainsi des leçons importantes pour les nouveaux venus du commerce électronique.

As Web-based business nears the decade mark, it is appropriate to take stock of its progress and the degree to which it has met or fallen short of predictions. Many authors, both academic and professional, have predicted

or measured e-business's reach in terms of revenue, profitability, and sheer volume. An area that remains largely unexamined, however, is the extent to which bricks and mortar companies have followed the prescriptions of consultants and researchers in designing their organizations to best implement e-business initiatives.

This paper discusses the findings of an on-line survey of individuals in Canadian companies with experience launching e-business initiatives. Conducted with the cooperation of *IT World* in May and June 2001, the survey explored the companies' approaches to e-business decision-making, application development, backend integration, and infrastructure maintenance. Senior executives and IT professionals reported on the locus of decision-making and systems development, as well as the degree to which these mechanisms produced satisfactory results.

The results discussed here are part of a larger study

of the evolution of organization structures for system building. The paper begins with a brief review of the literature and previous research on e-business implementation structures; a more detailed discussion of the literature and a causal model developed from that literature can be found in Grant and Huston (2000). A description of the survey design and administration comes next, followed by the results. The paper concludes with a summary of the lessons that can be drawn from the survey.

Review of the Literature

Because Web-based e-business is young (barely 10 years old at present), research is deep in some areas and shallow in others. Research in marketing, pricing, and technology issues is extensive, for example. Similarly, there is a considerable body of work focused on e-strategy, dating back to seminal work on technology, information, and competitive advantage by Porter (1985) and Porter and Millar (1985). Works such as Rayport and Sviokla (1994, 1995) helped businesses understand what systems to build and how to use them, but rarely demonstrated who should build them and where they should be built. These are important questions for an established business wondering how and whether to use its traditional development staff and organizational structures to make the move from bricks to clicks.

The past two years have seen the publication of studies shedding some light on these issues. Willcocks and Plant (2001) interviewed 130 executives in the U.S., Europe, and Australia, looking for attributes that distinguished leaders in business-to-consumer e-business from less successful firms. They conclude that successful firms could follow either a top-down or an outside-in approach. The former was driven by senior level focus on business plans and goals. The latter was driven by managers at the periphery of the organization who identified Web opportunities (a skunk-works approach). Furthermore, successful firms saw the Web as "part of a larger strategic investment in e-business" (p. 52). Laggards, on the other hand, made the IT department responsible for e-business and had senior executives that undervalued such initiatives. Willcocks and Plant also conclude that separate e-business units could, under specific circumstances, be a viable approach.

Shah and Dawson (2000) downplay unique aspects of e-commerce management, saying "managing IT is essentially the same as managing any other discipline" (p. 622). This is a position that one could readily challenge. Indeed, the researchers seem to contradict themselves, as they identify specific elements of the move to e-commerce that require focused attention from senior management. Those elements include the need to interface the new systems with existing databases and systems, the potential lack of personnel with e-business expertise, and the potential for new competitors emerging in non-traditional arenas.

Earl and Khan (2001), in contrast, see e-business as a major driver for change in IT departments. They argue that bricks and clicks firms should morph portions of their existing IT into "e-IT" units better equipped to implement e-business. The characteristics of Earl and Khan's e-IT units include co-location of IT and business personnel, willingness to take risks, a focus on the customer, and small size. The result would be dedicated, multidisciplinary e-business units drawn from existing personnel.

Staged analyses have a long history in IT. The best known is, perhaps, Nolan's (1979) prescription for a staged approach to data processing management, but it is a concept favoured in many areas. Most recently, e-business researchers and authors have adopted the phased, or incremental, perspective. Eduard (2001), for example, advocates a progression from brochureware to highly interactive, transformational systems. Throughout the process, he argues, companies should use a dedicated e-business team (combining IT and functional staff) that transfers leadership back and forth between IT and functional management. Kalakota, Oliva, and Donath (1999) identify five levels of business-to-business involvement, ranging from electronic data interchange (EDI) to fully integrated e-business and suggest that companies move along the e-business ladder at a pace compatible with their objectives, resources, and competitive environment. *CIO.com* (1999) reported on the staged implementation practices of Chubb and other large B2B practitioners. *CIO*'s analysis suggests that going after "low-hanging fruit" before moving on to complex systems promises successful returns on e-business investment.

Weill and Vitale (2002) studied 15 firms and concluded that different firms should choose different structures, depending on the infrastructure delivery demands made by their e-business model. In general, they say, traditional firms would need to invest heavily in IT infrastructure, but could go either internally or externally to deliver the needed services. The more strategic the service, the stronger the argument for developing the implementation capacity internally. Ultimately, the decisions on where to place infrastructure must be made by senior management.

Some researchers take a less contingent approach to the move from bricks to clicks. Pinker, Seidmann, and Foster (2002), for example, advocate the use of a chief e-commerce officer (CeCO) to manage the implementation of e-business when its objective is business improvement. In doing so, they argue for an e-business management team to coordinate projects and formulate

strategy. CIOs, they argue, must attend to cost containment, an approach that is incompatible with successful e-business initiatives.

Limited research has not prevented business advisors from prescribing implementation approaches. Patton (2000) encourages firms to form internal, but separate, Web teams to build their e-businesses, based on the experiences of three successful clicks and mortar companies. "The best Internet commerce strategy will never be implemented without the commitment and dedicated resources of top management," say Ware, Gebauer, Hartman, and Roldan (1998, p. 273). Kalakota and Robinson (2001) argue for outsourcing significant portions of the e-business value chain, particularly those that were outside the company's core competency. They point to five tasks they consider vital to successful "tactical execution": e-project management, e-development, e-infrastructure management, adoption management, and performance measurement.

Based on the limited research available to date in this area of e-business and on the advice seen in periodicals catering to executives, one might expect to see (a) phased approaches to implementation; (b) many cross-functional e-business teams; and (c) strong senior management involvement. However, most research has been based on a limited number of cases, and most of the companies studied were chosen as exemplars of success in this young and risky area. It is still too soon to hypothesize about the practices of the e-business population as a whole. Thus, the remainder of this article discusses exploratory and descriptive analysis of a broader e-business sample than has typically been studied.

Survey Methodology

Prior to the development of this survey, we had engaged in intensive interviews with companies that had successful North American or international e-business operations in the business-to-business arena. The findings from those interviews were used to construct and refine an on-line survey exploring how a broad range of companies organized their e-business decision-making and implementation. Specific research questions included: How involved was the organization and its management in e-business? How did the organization initiate and implement e-business ideas and applications? What was the role of the organization's information technology (IT) staff and external groups in the development and implementation of e-business projects?

The survey did not give respondents a specific or restrictive definition of e-business. In the interests of exploration, we wanted to capture initiatives as broadly as possible. We thus left it to the discretion of the respondents to use their companies' interpretation of the term. We deliberately used the term "e-business" because its common use is more inclusive than "e-commerce". We also provided two points of clarification in the wording of the questions: we specified (a) that we were interested only in Web-based initiatives (thereby limiting the scope to some degree), and (b) that brochureware sites were included. The five implementation activities interested us more than the type of project. However, future work differentiating practices according to the type of initiative would certainly be a valuable extension to this study.

The final survey comprised 45 items, including items that measured e-business scanning and the locus of decision-making and implementation. The survey was encoded as an HTML document with radio buttons for single-choice items, open text boxes for "other" or qualitative data entry, and branching to follow-up questions based on responses to specific closed items. A commercial on-line research firm was used to implement the survey. Their experts advised on question format, encoded the survey, delivered the invitation to participate, hosted the survey, gathered data, and formatted responses into a data set for subsequent analysis.

The survey was distributed in conjunction with *IT World* publications, which maintains an e-mail distribution list of subscribers. Under the logos of *CIO Canada* and the University of Victoria, we sent e-mail invitations to 21,493 subscribers, inviting subscribers to participate in the research study. Subscribers were given two weeks to respond to the invitation, after which the survey was archived.

Each e-mail invitation message contained an embedded URL link as well as text that invited potential respondents to participate in the survey. The recipient was instructed to click on a URL that immediately linked them to the survey resident on the host server. After the respondents linked to the on-line survey and completed the questionnaire, they then clicked on a "submit" button and the data were collected. Respondents were invited to include their e-mail address if they wished to receive a prepublication copy of the survey results. To meet University privacy requirements for research, those addresses were severed from the data prior to its release for analysis. They were kept in a separate file and used only to produce a mailing list for the prepublication reports.

The survey provided usable responses from 630 individuals, a 3% response rate. A number of factors must be taken into account in determining how informative a survey with this low response rate may be. First, the sample used was a commercial list and had not been "cleaned" to remove obsolete, duplicate or lapsed addresses. Thus, the denominator is inflated by errors in the list. Second, the survey is exploratory. While this

Table 1
Geographic Dispersion of Respondents

Nearest Metropolitan Area	% of Responses
Fredericton	2.1%
Halifax	2.7%
Ottawa	7.5%
Montreal	7.5%
Toronto/Niagara	39.3%
London/Windsor	3.1%
Sudbury/Thunder Bay	1.9%
Winnipeg	5.0%
Regina	2.9%
Edmonton	3.3%
Calgary	5.8%
Vancouver/Victoria	15.4%
Other	3.3%

paper discusses statistical findings, they are not meant to be conclusive tests of predictive hypotheses. Third, *CIO* management chose not to allow follow-up e-mails. Follow-ups would have undoubtedly increased the response rate, but *CIO* was understandably reluctant to appear to be spamming its readership. Finally, due to some problems with the external programming company, the first week of the two-week response period (when most responses to on-line surveys are received) ultimately straddled a major holiday weekend, which reduced the number of potential respondents who would be accessing their e-mail. Despite these caveats, the sample size is sufficient to produce results accurate within +/- 3.9% 19 times out of 20, which is adequate for exploratory work of this type.

Of the respondents, 480 worked in companies that had been active in e-business for more than one year. To ensure that this discussion focuses on practices that had taken root to some degree, the demographics and analysis reported in this paper concentrate on the subset of 480.

Profile of Respondents

Survey respondents were an experienced group, with 30.2% of the subgroup discussed in this paper having more than 10 years' experience in management. A further 19.2% had more than five years' experience in their current role. There was also considerable e-business experience embodied in the companies represented by the survey: 25.2% of the companies had been involved in e-business for more than five years, and another 53.9% had had e-business initiatives for two to five years. Corporate management (CxO, VP, GM) accounted for 20.6% of respondents, 26.2% were business unit management (Manager, Director), and 38.1% IT professionals. The major industry groups represented include information systems/services (23.7%), finances/insurance (10.6%), health/education/social assistance (15.8%), manufacturing (7.0%), and wholesale and retail trades (6.4%). Not surprisingly, the majority of respondents worked for organizations in the Toronto/Niagara region, but there was noteworthy distribution across the country (see Table 1).

Organization size is always difficult to measure, as it is not clear whether to use sales, size of staff, breadth of market, number of business units, or some other metric. Because we were most interested in the use of corporate, business unit, or external IT staff, we did not ask for measures of company size. Instead, we differentiated between companies with business unit IT groups versus those that only had central or corporate level IT groups. The responses indicated that 357 of the 480 respondents (74.4%) worked for organizations with business unit IT groups.

Results: Examining the Research Questions

In this section, we examine the survey data as it reflects on each of the research questions posed above before discussing general observations drawn from the responses.

Involvement of the Organization and Its Management in E-Business

The survey asked two series of questions to examine this issue. The first series comprised seven questions that asked about the significance to the company of e-business initiatives and the strategic posture (leader vs. follower) the company adopted. Table 2 provides the descriptive breakdown of these questions. The data strongly indicate that Canadian businesses engaged in e-business see it as a significant factor in their existence. More than half agreed or strongly agreed with the statements "Our e-business initiatives are vital to my company's success" and/or "Our e-business activities represent strategic initiatives."

This should not be interpreted to mean that those same businesses are leading a wave of innovation in products, services, or business models: Fewer than 35% said their company led its industry in innovative e-business products and services. 46.2% said that their company used e-business to deliver new products and services; an almost equal number (44.4%) said that

Table 2
E-Business Roles and Their Importance

2-a: "Our e-business initiatives are vital to my company's success"

	Frequency	Valid %	Cumulative %
Strongly disagree	48	10.1	10.1
Disagree	83	17.5	27.6
Midpoint	121	25.5	53.2
Agree	110	23.2	76.4
Strongly agree	112	23.6	100.0
Total	474	100.0	

2-b: "Our e-business activities represent strategic initiatives"

	Frequency	Valid %	Cumulative %
Strongly disagree	37	7.8	7.8
Disagree	54	11.4	19.2
Midpoint	113	23.8	42.9
Agree	156	32.8	75.8
Strongly agree	115	24.2	100.0
Total	475	100.0	

2-c: "E-business has enabled us to be innovative in the products and services we produce"

	Frequency	Valid %	Cumulative %
Strongly disagree	39	8.2	8.2
Disagree	73	15.4	23.6
Midpoint	141	29.7	53.3
Agree	144	30.3	83.6
Strongly agree	78	16.4	100.0
Total	475	100.0	

2-d: "We lead our industry in innovative e-business products and services"

	Frequency	Valid %	Cumulative %
Strongly disagree	81	17.0	17.0
Disagree	120	25.2	42.2
Midpoint	122	25.6	67.9
Agree	89	18.7	86.6
Strongly agree	64	13.4	100.0
Total	476	100.0	

Table 2 — continued
E-Business Roles and Their Importance

2-e: "We use e-business to deliver new products and services"

	Frequency	Valid %	Cumulative %
Strongly disagree	38	8.0	8.0
Disagree	85	17.9	25.8
Midpoint	133	27.9	53.8
Agree	143	30.0	83.8
Strongly agree	77	16.2	100.0
Total	476	100.0	

2-f: "We use e-business primarily to deliver our traditional products and services"

	Frequency	Valid %	Cumulative %
Strongly disagree	34	7.1	7.1
Disagree	69	14.5	21.6
Midpoint	161	33.8	55.5
Agree	145	30.5	85.9
Strongly agree	67	14.1	100.0
Total	476	100.0	

2-g: "E-business has given us new delivery channels for existing products and services"

	Frequency	Valid %	Cumulative %
Strongly disagree	35	7.4	7.4
Disagree	49	10.4	17.8
Midpoint	114	24.1	41.9
Agree	167	35.3	77.2
Strongly agree	108	22.8	100.0
Total	473	100.0	

e-business was used primarily to deliver traditional products and services.

This survey did not capture longitudinal data for each company, so it cannot demonstrate conclusively that the role and applications within a single company have changed over time. However, we can create subsets of responses, based on how long the company had been involved in e-business initiatives. This allows us to compare the responses of firms with extensive experience to those that have more recently entered e-business. In this, and subsequent analyses, we divided responses into three categories: (a) firms with 1-3 years of experience with e-business (recent entrants); (b) those with 3-5 years of experience (early followers); and (c) those with more than 5 years of e-business activity (early entrants). We then used ANOVA to test the hypothesis that the mean of each group differed, a surrogate indicator of changes over time that occurred or might occur in a single company.

Did the role and use of e-business change over time? The data analysis would suggest yes. In each of the six questions, ANOVA indicated significant differences in the mean, at levels ranging from .000 to .005. Table 3 presents the results of those analyses. One could conclude that, as companies gained experience with e-business, they broadened its use. The importance of new

Table 3
ANOVA re: Role and Importance of E-Business

		Sum of Squares	df	Mean Square	F	Sig.
E-business vital to company	Between Groups	36.341	2	18.171	11.473	.000
	Within Groups	745.973	471	1.581		
	Total	782.314	473			
E-business activities strategic	Between Groups	33.970	2	16.985	12.451	.000
	Within Groups	643.895	472	1.364		
	Total	677.865	474			
We lead our industry	Between Groups	47.551	2	23.775	15.351	.000
	Within Groups	732.573	473	1.549		
	Total	780.124	475			
E-business lets us innovate	Between Groups	21.213	2	10.606	8.113	.000
	Within Groups	617.048	472	1.307		
	Total	638.261	474			
Use e-business for new prods/servs	Between Groups	16.383	2	8.192	6.123	.002
	Within Groups	632.760	473	1.338		
	Total	649.143	475			
Use e-business for traditional prods/servs	Between Groups	21.230	2	10.615	9.056	.000
	Within Groups	554.408	473	1.172		
	Total	575.639	475			
E-business gives new channels	Between Groups	14.351	2	7.175	5.385	.005
	Within Groups	626.301	470	1.333		
	Total	640.651	472			

channels for traditional products and services increased, but so too did the innovations to generate and deliver new products. This is consistent with the recommendations in the literature, such as Eduard (2001), that companies begin with low-risk applications (brochure-ware, for example) and move to more innovative or integrated applications as they gain experience.

The second series of questions focusing on company involvement explored the extent to which the company sought to become informed about e-business opportunities and to develop the expertise needed to implement e-business using internal resources. Table 4 provides the distribution of responses to these seven questions. These results show an encouraging amount of organizational scanning going on in Canadian businesses. More than half of respondents reported that their companies scanned for, shared, and applied new e-business knowledge to the business.

Companies were also doing a reasonable job enabling learning among internal IT management and staff: More than half were reported to support IT management and staff in e-business learning and training. At the same time, the support for learning among non-IT management and staff was low. Only 41.1% of respondents reported support for non-IT management learning, while 33.4% agreed that their company provided support for such activities by non-IT staff. This is troubling because one might expect non-IT employees to be less likely than IT employees to independently seek such knowledge. Companies will need e-business expertise across the company, and particularly in senior decision makers from non-IT areas, if e-business is to succeed. Thus, e-business education for non-IT management and staff is an important element of implementation.

Once again, the surrogate analysis for effects of experience suggests that more experienced companies

Table 4
E-Business Scanning Activities

4-a: "My organization seeks out new e-business ideas"

	Frequency	Valid %	Cumulative %
Strongly disagree	23	4.8	4.8
Disagree	60	12.5	17.3
Midpoint	113	23.5	40.8
Agree	135	28.1	69.0
Strongly agree	149	31.0	100.0
Total	480	100.0	

4-b: "My organization incorporates new e-business opportunities into how we do business"

	Frequency	Valid %	Cumulative %
Strongly disagree	23	4.8	4.8
Disagree	65	13.6	18.4
Midpoint	137	28.6	47.0
Agree	148	30.9	77.9
Strongly agree	106	22.1	100.0
Total	479	100.0	

4-c: "In my organization, we share information about e-business and its application"

	Frequency	Valid %	Cumulative %
Strongly disagree	25	5.3	5.3
Disagree	70	14.7	20.0
Midpoint	146	30.7	50.6
Agree	148	31.1	81.7
Strongly agree	87	18.3	100.0
Total	476	100.0	

4-d: "My organization supports IT management in learning and training related to e-business"

	Frequency	Valid %	Cumulative %
Strongly disagree	27	5.7	5.7
Disagree	70	14.7	20.3
Midpoint	121	25.4	45.7
Agree	164	34.4	80.1
Strongly agree	95	19.9	100.0
Total	477	100.0	

Table 4 — continued
E-Business Scanning Activities

4-e: "My organization supports non-IT management in learning and training related to e-business"

	Frequency	Valid %	Cumulative %
Strongly disagree	43	9.0	9.0
Disagree	95	19.8	28.8
Midpoint	144	30.1	58.9
Agree	144	30.1	88.9
Strongly agree	53	11.1	100.0
Total	479	100.0	

4-f: "My organization supports IT staff in learning and training related to e-business"

	Frequency	Valid %	Cumulative %
Strongly disagree	27	5.7	5.7
Disagree	67	14.1	19.8
Midpoint	124	26.1	45.9
Agree	164	34.5	80.4
Strongly agree	93	19.6	100.0
Total	475	100.0	

4-g: "My organization supports non-IT staff in learning and training related to e-business"

	Frequency	Valid %	Cumulative %
Strongly disagree	57	12.1	12.1
Disagree	117	24.8	36.9
Midpoint	145	30.7	67.6
Agree	102	21.6	89.2
Strongly agree	51	10.8	100.0
Total	472	100.0	

carried out significantly more scanning and were more supportive of learning across the organization. The ANOVA demonstrates significant differences in scanning/learning activities at a level of .000 on each of the seven questions (Table 5).

This is consistent with the observation that early entrants are now making more strategic and broader use of e-business. However, these data do not indicate whether the scanning and learning leads to the broader use or vice versa. More longitudinal studies would be useful in this area, as the findings could contribute to understanding whether we improve adoption via education campaigns or motivate learning by encouraging e-business experimentation.

Locus of Ideas and Execution of Implementation

Five questions asked where the organization put responsibility for initiating, approving, and building e-business projects. These questions probed the level at which activities occurred, and whether IT groups, e-business groups, or someone else performed them. Table 6 summarizes the results according to the organizational level.

Table 5

ANOVA Re: E-Business Scanning Activities

		Sum of Squares	df	Mean Square	F	Sig.
Seeks out new e-business ideas	Between Groups	26.398	2	13.199	9.933	.000
	Within Groups	633.833	477	1.329		
	Total	660.231	479			
Use new e-business opportunities	Between Groups	35.341	2	17.670	14.907	.000
	Within Groups	564.221	476	1.185		
	Total	599.562	478			
Share e-business information	Between Groups	28.602	2	14.301	12.261	.000
	Within Groups	551.676	473	1.166		
	Total	580.277	475			
Supports IT mgmt learning	Between Groups	20.182	2	10.091	8.094	.000
	Within Groups	590.917	474	1.247		
	Total	611.099	476			
Supports non-IT mgmt learning	Between Groups	28.097	2	14.049	11.432	.000
	Within Groups	584.963	476	1.229		
	Total	613.061	478			
Supports IT staff learning	Between Groups	26.045	2	13.022	10.698	.000
	Within Groups	574.553	472	1.217		
	Total	600.598	474			
Supports non-IT staff learning	Between Groups	21.691	2	10.845	8.103	.000
	Within Groups	627.765	469	1.339		
	Total	649.456	471			

Corporate level groups dominated e-business initiation and development. The vast majority of firms used such groups (whether IT, e-business, or some other corporate body) as the source of ideas and approval, as well as to implement backend systems and technical infrastructure. Only in the area of application development do we see a meaningful amount of non-corporate involvement. The non-corporate involvement was almost evenly split between business units and other alternatives (such as vendors and independent contractors).

Unlike the impact of e-business, the locus of decision-making and implementation does not appear to change with experience. Table 7 presents the results of cross-tab analysis and the value of η (which measures significance when the test compares nominal data to interval data). Only the source of ideas ($\eta = 0.055$) and development of applications ($\eta = 0.048$) appear to be significantly related to the amount of corporate experience. These weak associations suggest that the two activities may take place more frequently at a corporate level in companies we've called early entrants. The analysis of e-business impact (above) indicated that early entrants were now making broader and more strategic use of the Internet. This would be consistent with a structure in which new ideas originated at the corporate level where senior executives had a broad vision of the organization and its opportunities.

Role of IT Staff and External Groups

The five questions described above can also be examined in terms of the kind of unit (as opposed to its level in the organization) that executes the activity described. The previous discussion broke down the answers in terms of corporate versus business unit

Table 6
Role of Organizational Units in E-Business

6-a: "Ideas for e-business applications most commonly come from:"

	Frequency	Valid %	Cumulative %
Corporate group	295	61.5	61.5
Business unit group	133	27.7	89.2
Other	52	10.8	100.0
Total	480	100.0	

6-b: "Final approval for e-business application projects most commonly comes from:"

	Frequency	Valid %	Cumulative %
Corporate group	360	75.0	75.0
Business unit group	54	11.3	86.3
Other	66	13.7	100.0
Total	480	100.0	

6-c: "E-business application development is most commonly done by:"

	Frequency	Valid %	Cumulative %
Corporate group	243	50.6	50.6
Business unit group	104	21.7	72.3
Other	133	27.7	100.0
Total	479	100.0	

6-d: "Development and/or integration of e-business backend systems is most commonly done by:"

	Frequency	Valid %	Cumulative %
Corporate group	278	57.9	57.9
Business unit group	86	17.9	75.8
Other	116	24.2	100.0
Total	480	100.0	

6-e: "E-business infrastructure (networks, architecture, platforms) is most commonly the responsibility of:"

	Frequency	Valid %	Cumulative %
Corporate group	327	68.1	68.1
Business unit group	80	16.7	84.8
Other	73	15.2	100.0
Total	480	100.0	

Table 7

Cross-tabs - Role of Organizational Units in E-Business Over Time

			Time in E-business			
			1-3 yrs	3-5 yrs	> 5 yrs	Total
Source of ideas	Business	Count	54	48	31	133
		Expected Count	58.7	40.7	33.5	133.0
	Corporate	Count	132	80	83	295
		Expected Count	130.3	90.3	74.4	295.0
	Other	Count	26	19	7	52
		Expected Count	23.0	15.9	13.1	52.0
Total		Count	212	147	121	480

Significance: $\eta = 0.055$

			1-3 yrs	3-5 yrs	> 5 yrs	Total
Approval	Business	Count	22	19	13	54
		Expected Count	23.9	16.5	13.6	54.0
	Corporate	Count	157	109	94	360
		Expected Count	159.0	110.3	90.8	360.0
	Other	Count	33	19	14	66
		Expected Count	29.2	20.2	16.6	66.0
Total		Count	212	147	121	480

Significance: $\eta = 0.048$

			1-3 yrs	3-5 yrs	> 5 yrs	Total
Applications	Business	Count	39	34	31	104
		Expected Count	45.9	31.9	26.2	104.0
	Corporate	Count	89	84	70	243
		Expected Count	107.3	74.4	61.3	243.0
	Other	Count	84	29	20	133
		Expected Count	58.7	40.7	33.5	133.0
Total		Count	212	147	121	480

Significance: $\eta = 0.195$

			1-3 yrs	3-5 yrs	> 5 yrs	Total
Backend	Business	Count	38	22	26	86
		Expected Count	38.0	26.3	21.7	86.0
	Corporate	Count	102	95	81	278
		Expected Count	122.8	85.1	70.1	278.0
	Other	Count	72	30	14	116
		Expected Count	51.2	35.5	29.2	116.0
Total		Count	212	147	121	480

Significance: $\eta = 0.161$

			1-3 yrs	3-5 yrs	> 5 yrs	Total
Infrastructure	Business	Count	37	22	21	80
		Expected Count	35.3	24.5	20.2	80.0
	Corporate	Count	127	108	92	327
		Expected Count	144.4	100.1	82.4	327.0
	Other	Count	48	17	8	73
		Expected Count	32.2	22.4	18.4	73.0
Total		Count	212	147	121	480

Significance: $\eta = 0.115$

Table 8
Role of IT vs. Others in E-Business Activities

8-a: "Ideas for e-business applications most commonly come from:"

	Frequency	Valid %	Cumulative %
IT group	194	40.4	40.4
E-business group	167	34.8	75.2
Other	119	24.8	100.0
Total	480	100.0	

8-b: "Final approval for e-business application projects most commonly comes from:"

	Frequency	Valid %	Cumulative %
IT group	265	55.2	55.2
E-business group	127	26.5	81.7
Other	88	18.3	100.0
Total	480	100.0	

8-c: "E-business application development is most commonly done by:"

	Frequency	Valid %	Cumulative %
IT group	171	35.6	35.6
E-business group	114	23.8	59.4
Other	195	40.6	100.0
Total	480	100.0	

8-d: "Development and/or integration of e-business backend systems is most commonly done by:"

	Frequency	Valid %	Cumulative %
IT group	230	47.9	47.9
E-business group	70	14.6	62.5
Other	180	37.5	100.0
Total	480	100.0	

8-e: "E-business infrastructure (networks, architecture, platforms) is most commonly the responsibility of:"

	Frequency	Valid %	Cumulative %
IT group	290	60.4	60.4
E-business group	54	11.3	71.7
Other	136	28.3	100.0
Total	480	100.0	

Table 9
Cross-tabs - Role of IT vs. Others in E-Business Activities

			Time in E-business			
			1-3 yrs	3-5 yrs	> 5 yrs	Total
Source of ideas	E-Business	Count	63	51	53	167
		Expected Count	73.8	51.1	42.1	167.0
	IT	Count	93	54	47	194
		Expected Count	85.7	59.4	48.9	194.0
	Other	Count	56	42	21	119
		Expected Count	52.6	36.4	30.0	119.0
Total		Count	212	147	121	480
Significance: $\eta = 0.126$						
Approval	E-Business	Count	49	38	40	127
		Expected Count	56.1	38.9	32.0	127.0
	IT	Count	122	82	61	265
		Expected Count	117.0	81.2	66.8	265.0
	Other	Count	41	27	20	88
		Expected Count	38.9	27.0	22.2	88.0
Total		Count	212	147	121	480
Significance: $\eta = 0.077$						
Applications	E-Business	Count	37	39	38	114
		Expected Count	50.3	34.9	28.7	114.0
	IT	Count	63	59	49	171
		Expected Count	75.5	52.4	43.1	171.0
	Other	Count	112	49	34	195
		Expected Count	86.1	59.7	49.2	195.0
Total		Count	212	147	121	480
Significance: $\eta = 0.215$						
Backend	E-Business	Count	26	22	22	70
		Expected Count	30.9	21.4	17.6	70.0
	IT	Count	84	80	66	230
		Expected Count	101.6	70.4	58.0	230.0
	Other	Count	102	45	33	180
		Expected Count	79.5	55.1	45.4	180.0
Total		Count	212	147	121	480
Significance: $\eta = 0.172$						
Infrastructure	E-Business	Count	19	13	22	54
		Expected Count	23.9	16.5	13.6	54.0
	IT	Count	113	101	76	290
		Expected Count	128.1	88.8	73.1	290.0
	Other	Count	80	33	23	136
		Expected Count	60.1	41.7	34.3	136.0
Total		Count	212	147	121	480
Significance: $\eta = 0.189$						

responsibility. In this section, we consider them in terms of IT versus e-business staff responsibility.

Table 8 provides the frequency distributions summarized according to function, e-business versus IT versus other. Once again we see a pattern of dominance (in this case by IT groups), particularly in the area of system construction. Despite the advice described in the literature, more companies chose to use IT staff than dedicated e-business teams. Even companies that had e-business groups and used them for idea generation or project approval were less likely to use such groups to develop applications and backend systems or to maintain infrastructure.

The prevalence of outsourcing in application development, backend integration, and infrastructure maintenance is not surprising. Computer Economics' (2002) e-business spending study showed a marked increase in outsourcing of Website functions in the U.S. Across 11 business sectors, 47.4% of companies responding outsourced at least one Website function, while 8.6% outsourced all functions. Fewer companies responding to our survey outsourced at least one function (31% vs. 47.4%), but our questions did not specifically include Web hosting and that may account for some of the difference. A similar, but slightly lower, proportion outsourced all functions: 7.7% of our respondents indicated that their company outsourced all development, integration, and infrastructure maintenance, as compared to Computer Economics' 8.6% of industries outsourcing "all website functions" (p. 5).

Once again, early entrants did not differ significantly from early followers or recent entrants in terms of the type of group used to perform the activities of interest (see Table 9 for the results of statistical analysis). In one sense, this is surprising. One might expect firms to develop in-house expertise over time and thus rely less on outside sources. However, changes in the economy and the dot-com environment have increased the availability and reduced the price of independent contractors. Those changes have contributed to an increase in the use of contract employees to perform e-business programming work, a trend discussed in the next section.

Source of Employees

When companies begin their first e-business activities, there are a number of places they can turn for staff. First, there are the internal, permanent options: using existing staff that have e-business skills, training unskilled staff, or hiring new staff. Next are the external, limited-term options: hiring independent contractors, or outsourcing the work to a company that performs e-business services. Finally, the company may use some

other, unanticipated arrangement. These same options apply when the company expands its e-business activities and needs to increase its implementation team. We were interested to uncover which approaches were prevalent among Canadian companies.

Table 10 provides the breakdown of responses to two questions: "When your organization began its first e-business initiatives, what was its primary source of e-business employees?" and "When your organization needs additional e-business employees now, where do you find them?"

As shown in the table, the most prevalent source of employees for the first initiatives was internal. In acquiring their original e-business employees, companies depended primarily on permanent staff. They turned most often to the IT group, either using IT staff who already had e-business skills or training staff in the needed skills. Next in frequency was the use of independent contractors, individuals for hire on a project basis for the e-business activity. The picture is slightly different when it came to acquiring e-business skills for subsequent projects or when additional staff is now needed in a company. Permanent solutions combined still accounted for the majority of staff, notably hiring new personnel with e-business skills. However, the most prevalent single source of expertise was independent contractors.

Next we compared first staffing practices to most current practices by conducting a contingency analysis. The analysis, shown in Table 10c, groups practices into three categories: using or training existing staff (whether IT or non-IT), hiring new e-business staff, and choosing one of the limited term options (contractors or outsourcing). The analysis showed a strong relationship between the first technique a company used and its subsequent choices. That is, companies that used permanent solutions (such as using IT staff or hiring new employees) for the first project were likely to do so when additional staff was needed.

There were shifts in specific categories worth noting. First, as might be expected, there was a large increase in the number of new e-business hires, making it the second most prevalent staffing method. This undoubtedly reflects the fact that many companies had made what use they could of existing staff and thus had to go outside if additional expertise was required. Second, the most prevalent approach was hiring independent contractors. Anecdotal evidence suggests this is the result of increased availability (and reduced cost) of such independents in the wake of shake-ups in the industry occurring shortly before the survey. One may also attribute it to a need for short-term skills for specific projects, but either explanation would require further research for confirmation.

Table 10
Source of Employees

10-a: Source of First E-Business Employees

	Frequency	Valid %	Cumulative %
Existing e-business skilled IT staff	174	36.8	36.8
New e-business skilled IT staff	47	9.9	46.7
Trained existing IT staff	95	20.1	66.8
Trained existing non-IT staff	17	3.6	70.4
Hired independent contractors	71	15.0	85.4
Outsourced to e-business firm	48	10.1	95.6
Other employee	21	4.4	100.0
Total	473	100.0	

10-b: Source of New E-Business Employees

	Frequency	Valid %	Cumulative %
Existing e-business skilled IT staff	80	16.9	16.9
New e-business skilled IT staff	105	22.2	39.0
Trained existing IT staff	93	19.6	58.6
Trained existing non-IT staff	17	3.6	62.2
Hired independent contractors	116	24.5	86.7
Outsourced to e-business firm	47	9.9	96.6
Other employee	16	3.4	100.0
Total	474	100.0	

10-c: Cross-tab of First Employees * New Employees

			New			
			Existing Staff	New Staff	External	Total
First	Existing	Count	150	66	65	281
	Staff	Expected Count	115.6	66.3	99.1	281.0
	New	Count	12	25	9	46
	Staff	Expected Count	18.9	10.9	16.2	46.0
	External	Count	21	14	83	118.0
		Expected Count	48.5	27.8	41.6	118.0
Total		Count	183	105	157	445

Contingency Coefficient = 0.445   Approx. Sig. = .000

NB: Figures will not add to corresponding categories in 10-a and 10-b, due to casewise deletion for missing values and exclusion of "other" category from analysis in 10-c

Limitations

As with any study, one must take into account the limitations of the survey that forms the basis of this discussion. First, and foremost, the responses may not represent the population of Canadian businesses accurately. There is the general issue of response rate, discussed at length earlier in this paper. The source of participants is also a factor to consider. Respondents were solicited from the readership of *IT World* publications, and that readership is apt to be more technically educated and progressive than the average business executive. Second, the companies represented by the readership may be more experienced and proactive, inflating the figures on e-business scanning. Third, the responses are the perceptions of executives and IT professionals in the companies represented. We cannot guarantee that the respondent is the best-informed source for the information we have gathered. We designed this survey for exploration, so problems of representation and statistical conclusion should not be considered fatal; however, they do mean that the lessons learned should be considered informative, rather than conclusive.

As noted in the Profile section of this paper, we did not capture the size of the organization. The presence of business unit IT groups may imply a larger company, but it is, at best, an imperfect surrogate for size. For example, the decision not to have business unit IT may reflect preference for centralized structures rather than the fact that the company is too small to bother with such groups. The measures needed to gather more specific information in this regard would have added unreasonable length to the survey. Thus, we preferred to gather the structure measure and draw conclusions related to structure. Future work would add to these findings, however, if it were to analyze such practices as they correlate to more precise measures of size.

Finally, one cannot use cross-sectional data to conclusively demonstrate causality or changes over time. We have not drawn any causal conclusions from the data, but we have asserted that it suggests trends over time. Those assertions should now be tested using methods more suited to longitudinal analysis.

Conclusion: Lessons Learned

This paper has discussed the findings of a survey of 480 individuals from Canadian companies with experience implementing e-business. It provides both encouraging and worrisome news, which is summarized here.

Contrary to predictions found in the academic and trade press, the companies examined here did not embrace the notion of e-business teams to implement their strategies. The most common use of e-business teams was to initiate and approve projects, but an integrated team responsible for all phases of implementation was not common. Nor was there evidence of the skunkworks or outside-in approach, in which systems emerged from business units and those units took the lead in e-business. At the same time, there was some evidence that recent entrants were more likely to have business units that initiated e-business projects.

As predicted, decision-making was highly centralized; it was also commonly concentrated in the hands of the corporate IT group. Willcocks and Plant (2001) argued that leaving e-business to the IT group characterized laggard companies, which they considered unsuccessful. If that is true, many Canadian companies (even those who see themselves as industry leaders) may have set themselves up to lag the global competition. Countering this potential for lagging will require that businesses more actively involve functional executives in the strategic elements of e-business implementation. In addition, it argues for ensuring that IT executives deeply understand and are driven by an overarching corporate vision. There are, however, no similar studies about practices in other countries. Extending the work to other countries would add valuable insights into the degree to which Canadian implementations reflect or differ from practices elsewhere.

The lessons from early entrants, those firms that had been involved in e-business for more than five years, may be especially useful in helping later entrants. Early entrants demonstrated more attention to scanning and education of non-IT management and staff. They recognized that e-business is business, rather than simply a technical specialization. Educating non-IT staff early about e-business's potential would enable them to play a more active role in its implementation.

Staffing practices are also informative. The increase in independent contracting and reliance on new hires may spell new opportunities for technically trained graduates. It also suggests significant new organizational issues for companies that must either integrate new staff into an area of strategic significance or manage external contractors in such projects. Further research specifically focused on the e-business staffing arena would clearly benefit companies at all stages of e-business.

Finally, the results suggest that companies are less inclined to stick to core competencies than e-business consultants would advise. There is a preference for internal implementation options over reliance on external specialists. Whether this is an artifact of the sample or reflects Canadian businesses in general remains to be determined. It deserves more focused study.

In conclusion, this survey has provided a first look at implementation practices in a wide variety of busi-

nesses and industry, using reports from senior executives and IT professionals. It offers useful preliminary insights and suggests numerous areas for future research into Canadian e-business practice.

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