

The Impact of ICT on the Management of Canadian Volunteer Programs

Information and Communications
Technology: Beyond Anecdotes

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The logo for Canada, featuring the word "Canada" in a serif font with a small red maple leaf icon above the letter "a".

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Introduction

Organizations of all types in the private, public, and nonprofit sectors are constantly being urged to improve their performance by adopting the tools of information and communications technology (ICT) such as computers, software, and the Internet. Recent international research shows that, although nonprofits are increasingly adopting new ICT (Parmegiani & Sachdeva, 2000), many do not always make the most effective use of these new tools (NonProfits Policy and Technology Project, 1998; Cravens, 2000; Hall Aitken, 2001; Murray & Harrison, 2002; Volunteersonline, 2001; Pitkin & Manzo 2002; Ticher, Maison, & Aba, 2002; Schneider, 2003).

Two themes are emerging from this research. As competition for resources increases within the nonprofit sector, failure to use ICT effectively may be problematic for some organizations. (Brock, 2002; Schneider, 2003). Second, failure to use ICT effectively

is not limited to the nonprofit sector, and it takes time before new technologies are used to their full potential (OECD, 2000). Furthermore, questions remain about what determines whether ICT applications will be effective or not (DeLone & McLean, 1992; 2002; Seddon & Kiew, 1994; 1996; Seddon, 1997; Garrity & Sanders, 1998; Seddon, Graeser, & Willcocks, 2002).

The “digital divide” has been a concern for the federal government and the nonprofit sector in Canada (Government of Canada, 2002). This divide is often attributed solely to a lack of physical access to ICT. However, it can also stem from ineffective use of ICT (Warschauer, 2003, pp. 31-48; Garrity & Sanders, 1998).

Although not yet well understood, the “ineffective use” problem can be described in a number of ways. For example, some ICT systems may not meet technical and information needs of users and/or may fail to deliver the benefits users expected (DeSanctis, 1983; Franz & Robey, 1986; Davis, 1989; DeLone & McLean, 1992; 2002; Seddon & Kiew, 1994; Seddon, 1997; Garrity & Sanders, 1998; Seddon, Graeser, & Willcocks, 2002). Whatever the reason for ineffective use of ICT, if the problem is not corrected, it may lead to an “effectiveness divide” between organizations that are deriving maximum benefit from ICT and those that are not.

The purpose of this report is to add to our knowledge about the effective use of ICT in the nonprofit sector by presenting the results of new research into the factors that impact ICT use and effectiveness in the management of volunteer programs in Canada.

Definitions

For the purposes of this report, information and communications technology (ICT) consists of three components:

- Hardware – the equipment or machines that facilitate information and communications processing, including personal computers, fax machines, cellular telephones and handheld computers;
- Software – the programs that are used to run computer and other hardware devices. These applications include off-the-shelf computer-based software applications; custom-built software applications; and online software that can be accessed over a network; and
- Networks – access to the Internet or to an Intranet (i.e., a network that can be accessed only within the organization that administers it).

For the purposes of this report, an information system (IS) consists of ICT components that, when used in combination enable information to be shared (Clarke, 2001, p. 115).

A Model for the Analysis of ICT Use and Effectiveness

This report attempts to answer two questions:

1. What affects the amount and type of ICT used in Canadian volunteer management programs?
2. What affects how managers of volunteer resources perceive the effectiveness of these ICT applications?

In the volunteer management arena, most of the research coming from Canada, the United Kingdom, and the United States reveals that factors internal to the user organization may result in barriers to effective use of ICT (Cravens, 2000; Murray & Harrison, 2002, Ticher, Maison, & Aba, 2002; Hall Aitken, 2001; Pitkin & Manzo, 2002; Saidal & Cour, 2003; Schneider, 2003,). Some of these factors are specific to managers of volunteer resources (MVRs), such as their demographic characteristics, work experience, and attitudes towards use of ICT as applied to their work. Other factors arise from characteristics of the organization, and the level of support and involvement it provides in applying new ICT (e.g., the degree to which it encourages active participation in decisions about organizational and ICT matters, how much training and development it provides to those who must use ICT, the amount of money it invests in ICT, and the perceived priority attached to implementing ICT changes). Finally, there may be perceptions at the technical systems level that ICT is difficult to use or in some way fails to meet the task demands of volunteer management.

Together, these factors represent three broad sets of influences on ICT use and effectiveness:

- Organizational systems influences – factors that interfere with the ability of MVRs to direct, implement, and support ICT changes;
- Technical influences – the nature of the technology itself that may affect its ability to meet information and task demands; and,

- Social-individual influences – characteristics of end-users including their backgrounds, their involvement in ICT and the organization more generally, and attitudes or expectations of benefits that affect their interaction with ICT.

These three types of influences are thought to affect the use and effectiveness of ICT within the institutional environment.

This report attempts to provide insight into how factors impact ICT use and effectiveness by answering the following:

1. What are the patterns of ICT use?
2. What are the patterns of perceived ICT effectiveness?
3. What are the major factors associated with ICT use?
4. What are the major factors associated with perceived ICT effectiveness?
5. What factors are the best predictors of ICT use and effectiveness in the model?

The Research Process

We asked those with responsibility for managing volunteer resources (MVRs) in nonprofit organizations in Canada to respond to an online questionnaire that contained questions about themselves, their organization, their job, and how they use ICT in their work, including their use of e-mail, Web sites and Volunteer Canada's interactive online volunteer recruitment system, the Volunteer Opportunities Exchange (VOE).

The VOE system was chosen as one of the ICTs assessed because it is a fairly new system and because Volunteer Canada has voiced some concerns about its acceptance and level of usage. Based on our previous research (Murray & Harrison, 2002), we were aware that some MVRs were quite happy with the system and its ability to match volunteers to volunteer positions. Variation in perceived usefulness would allow us to investigate why some MVRs had embraced VOE, while others had not.

The questionnaire was developed based on (i) reviews of the existing literature on changes in work, ICT use in volunteer management, and information system success; (ii) personal interviews with leaders in Canada's nonprofit sector and an international expert in the field; and, (iii) focus group interviews with volunteers and paid staff in nonprofit organizations in the Victoria, BC area. Focus group participants included MVRs, executive directors of volunteer organizations, and information system support personnel.

The questionnaire was developed over a three-month period during the winter of 2003. It was first developed and pre-tested on paper, then programmed and pre-tested again in an online format.¹ Implementation began during the late spring, with completion in the early summer of 2003.

The data for this report come from two sub-samples of the same respondent group (MVRs in Canada). The first sub-sample, the VOE group, is considered to be "e-enabled" as it consists of MVRs who are on the Internet mailing list of Volunteer Canada's Volunteer Opportunities Exchange (VOE). The second sub-sample, the Local Volunteer Centre (LVC) group, consists of MVRs from across Canada who were on the mailing lists of a number of local volunteer centres.² The LVC group uses a variety of methods to reach its membership, including e-mail, listserves, fax, and newsletters (paper-based and electronic).

Response rates were determined by dividing the number of responses by the total number of respondents reached. For the VOE group, the survey was distributed to 2745 registered users of Volunteer Canada's VOE specialty volunteer recruitment software. Of that 2745, only 516 e-mails were "delivered" to the specified address and, of these, 467 were acknowledged by the user as received while 49 were not (27 displayed out of office replies, 20 were not read, and 2 were deleted). The low rate of receipt was most likely due to a high rate of delivery failure.

Over 216 Internet Service Providers (ISPs) reported that the e-mail failed to reach its destination. The

¹ A possible criticism of the use of the online questionnaire sampling method is that the sample would be biased in favour of ICT users. This concern is not of great importance for several reasons. First, an earlier phase of this research that compared access to ICT in volunteer programs using traditional mail-out and ICT sampling methods (see Murray & Harrison, 2002) found no significant differences between those in both groups who responded to mailed vs. on-line questionnaires. It also found that Internet and e-mail usage is very high (Murray & Harrison, 2002, p.4). Finally, it must be noted that this research is focussed explicitly on the use and perceived effectiveness of ICT, so it was imperative that our sample be ICT or "e-enabled."

² Local volunteer centres promote and support volunteerism on behalf of voluntary organizations within their regions in Canada.

exact number of e-mail failures is difficult to determine as each ISP could have several accounts, which would result in multiple failures within a single notification. Because of this problem, the VOE response rate was calculated by dividing the number of receipted e-mails (467) by the number of VOE surveys completed (325). By this calculation, the VOE group survey response rate was 70%. For the LVC group, 17 local volunteer centres in Canada distributed the survey to as many as 4500 member organizations. We received 137 completed surveys from the LVC group, yielding a response rate of 3%.

It should be noted that our sample cannot be considered representative of all volunteer-involving organizations in Canada. Obtaining this kind of representative sample is virtually impossible because there is no comprehensive contact list. In spite of this limitation, the total sample does represent a diversity of Canadian nonprofit organizations in terms of location, organization size (determined by the size of the budget), mission, number of volunteers, and organization affiliation (see Table 1).


The largest group of respondents (45%) came from Ontario (see Table 1). The next largest groups were from British Columbia (19%) and Alberta (16%). Respondents from the remaining regions made up 20% of the sample.

The participation of organizations by type of mission was similar to our 2001-2002 sample. Organizations with annual budgets in excess of \$1 million made up 41% of our sample, up from 32% in our previous survey. The largest groups remained health (27%) and social services (33%) organizations. The number of education organizations increased slightly (from 4% to 10%), while the number of environmental organizations decreased (from 10% to 4%).

More than half (52%) of respondents had more than 100 volunteers involved in their program. More than one fifth (21%) involved between 51 and 100 volunteers.

Table 1: Characteristics of Responding Organizations

Characteristic	Number	Percent
Province		
Territories	5	1
British Columbia	86	19
Alberta	72	16
Saskatchewan	33	7
Manitoba	20	4
Ontario	209	45
Quebec	11	2
Atlantic Canada	26	6
Total	462	100
Mission Type		
Social Services	154	33
Health	126	7
Education	48	27
Arts and Culture	30	10
Sports and Recreation	20	4
Environment	18	4
International Aid	9	2
Religion	1	<1%
Other	56	12
Total	462	100
Budget Size		
Less than \$50,000	45	10
\$50,000-250,000	93	20
\$250,000-500,000	66	14
\$500,000-1,000,000	67	14
Greater than \$1,000,000	191	41
Volunteer Program Size		
Less than 10	23	5
11-25	49	11
26-50	53	11
51-75	46	10
76-100	50	11
Greater than 100	241	52
Total	462	100
Organization Type		
Member of formal network	121	26
Member of association network	223	48
No network affiliation	118	26
Total	462	100



Most respondents were from organizations that were either members of an association of similar organizations (48%) or part of a formal structure, such as a branch or subsidiary of a larger organization (26%). About one quarter (26%) had no network affiliations.

Patterns of ICT Use

Patterns of ICT use were determined by examining how volunteer programs were making use of their ICT, including Web sites, e-mail, and the Volunteer Opportunities Exchange (VOE).

Use of Web Sites:

To assess how volunteer programs were making use of organizational Web sites, we asked MVRs to indicate whether their organization had a Web site and to identify the extent to which the Web site was used to support the volunteer program. Expanding upon Murray and Harrison's (2002) levels of e-connectivity, we assessed how volunteer programs were making use of organizational Web sites by using the following four-point scale:

- Level 1: Web sites are used for hosting information about the volunteer program.
- Level 2: Web sites are used for hosting information, as well as for interactive features, such as online volunteer applications, or online surveys.
- Level 3: Web sites are used for Level 2 features, as well as to give remote access to databases to those within the organization.
- Level 4: Web sites are used for Level 3 features, as well as to give "outsiders" access to internal databases.

We found that 90% of organizations had Web sites and that 88% used their sites for volunteer program purposes. Although Web site usage for volunteer programs was high, the overall level of Web site functionality was low – 1.5 on our four-point scale of e-connectivity. Most volunteer programs in our sample (70%) were at Level 1, making use of their organizations Web site strictly as a means to host information about their volunteer program. Only one fifth (20%) were at Level 2, using their sites to interact with members and volunteers, and only 10% were at Level 3 or 4 (see Figure 1).

Use of E-mail:

To assess how e-mail was being used by MVRs in Canadian volunteer programs, we examined two types of usage:

- Type 1: E-mail is used for "organizational" purposes, which consists of the following items: sharing information with management and staff in the organization; sharing information with colleagues in other organizations; and sharing tasks with others at a distance.
- Type 2: E-mail is used for "volunteer management" uses, which consists of the items: sharing information with volunteers; personal communication with volunteers about their position or work schedule; and personal recognition messages to individual volunteers.

From Figure 2, it can be seen that e-mail is used most often for organizational purposes (receiving an average rating of 4.0 out of 5) rather than for volunteer management purposes (3.4 out of 5). Almost half of all respondents (47%) reported that they used e-mail for organizational purposes "very much," while less than one third (32%) reported that they used e-mail for volunteer management purposes "very much." This suggests that e-mail use is not yet seen as a mainstream tool for managing volunteers.

Use of the VOE:

Although we found that use of e-mail and Web sites was high in volunteer programs, the use of online specialty software to recruit volunteers was low. Of 462 respondents, only 27% had ever used the VOE.

With the exception of Alberta, the geographic distribution of VOE users closely mirrors the geographic distribution of survey respondents (see Table 2). Nearly half (45%) of VOE users were from Ontario. There were pockets of VOE activity in British Columbia (14%), Saskatchewan (11%), Manitoba (9%),

and Alberta (9%). VOE use in Atlantic Canada and in the north is very low.

The question is to what extent is VOE use explained by the distribution of respondents? The answer is unknown. One could speculate that because the sample was derived from Volunteer Canada's list of VOE users, these percentages are indicative of the percentage of early adopters of ICT. While the reasons for early adoption of the VOE are also unknown, one could speculate that they could be related to the fact that the VOE is operated from Ontario or because the VOE has been promoted within specific regions either by Volunteer Canada or by local volunteer centres. Whatever the reason, there is clearly a need for strategies that target under-represented regions in Canada.

Figure 2: Types of E-mail Use

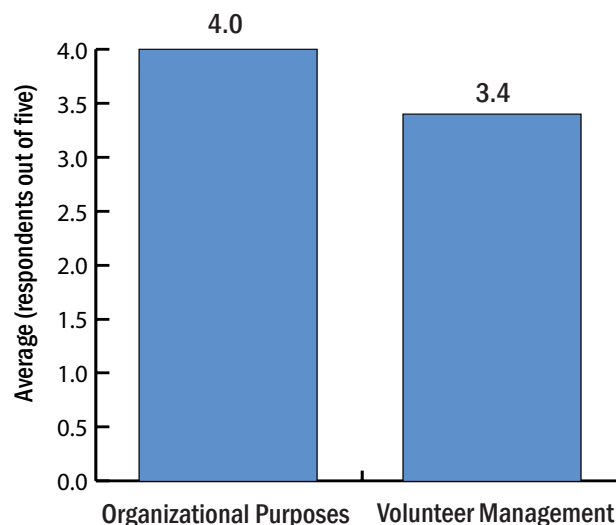


Figure 1: Level of Volunteer Program Web Site Connectivity

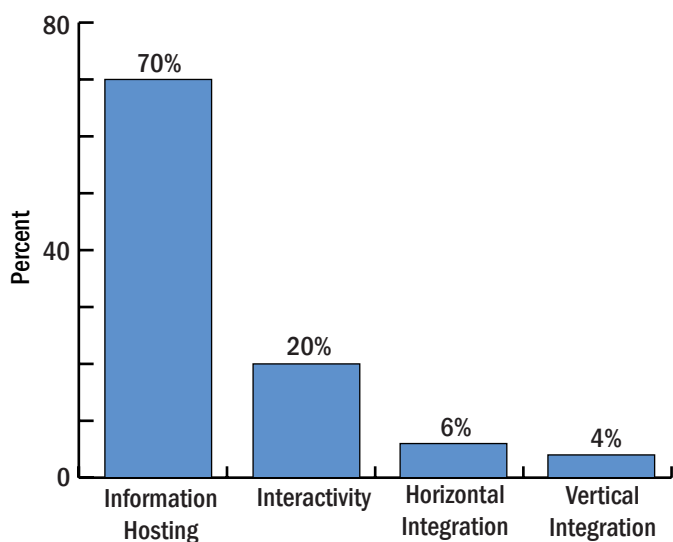


Table 2: Geographic Distribution of VOE Users

Province	Number (n)	Percent (%)
Territories	12	9
British Columbia	18	14
Alberta	8	6
Saskatchewan	58	46
Manitoba	12	9
Ontario	14	11
Quebec	5	4
Atlantic Canada	1	1
Total	128	100

Patterns of ICT Effectiveness

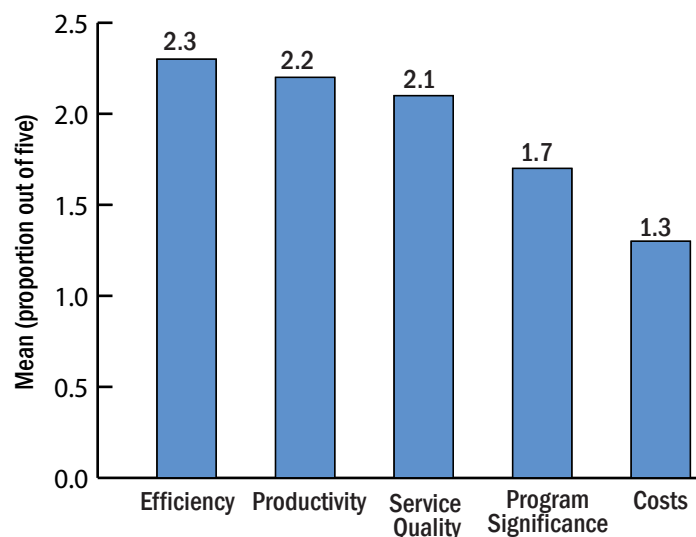
We determined ICT effectiveness patterns by examining:

- MVRs' perceptions of the overall impact of available ICT on reducing costs, increasing productivity, improving efficiency, improving service quality, increasing the awareness of the significance of the volunteer program; and other aspects of volunteer management. ICT impact was assessed using a four-point scale where 0 represents no impact and 3 represents large impact.
- MVRs' perceptions of the impact of the VOE on matching volunteers to available positions, saving time, and recruiting volunteers. VOE impact was assessed using a five-point scale where 1 represents not at all or extremely inefficient or ineffective and 5 represents very much or extremely efficient or effective. We also asked respondents to rate their overall satisfaction with the VOE and whether or not they involved others in using the VOE using a five-point scale where 1 represents very dissatisfied or not at all and 5 represents very satisfied or very much. The greatest impacts of ICT appear to be on increasing the efficiency of volunteer programs (rated 2.3 out of 3; see Figure 6), followed by increasing productivity (2.2 out of 3), improving service quality (2.1 out of 3), and increasing awareness of the volunteer program (1.7 out of 3). Interestingly, ICT had the least reported impact on reducing costs (1.3 out of 3). This suggests that ICT may be thought of more as an investment than as a means to reduce volunteer program costs.

The greatest area of impact of the VOE was on efficiency in saving time (rated 2.5 out of 5). MVRs did not rate the VOE's effectiveness

in matching volunteers to positions (2.1) or in recruiting volunteers (2.1) as highly. Overall mean satisfaction with usage was rated at 2.4 out of 5 while, involving others in using the VOE was rated lower (2.1). These findings suggest that while the VOE system may save time and is satisfying to use, it is not yet seen as meeting recruitment needs and is most likely not being informally promoted by MVRs as a result.

Figure 3: Perceived Impact of ICT on the Volunteer Program



Major Factors of ICT Use

One of the goals of this research project was to identify the factors that affect patterns of ICT use in volunteer programs. While a study such as this one conducted at one point in time does not permit any conclusions to be made about causality, it does allow us to identify factors in our model can be associated with ICT use. To this end, we examined three sets of factors – organizational systems factors, technical factors, and socio-individual factors – to determine which were associated with the use of e-mail, Web sites and the VOE.

Organizational Systems Factors:

Does the nature of the MVR's job influence the amount and level of ICT used in volunteer programs? What about leadership, co-worker support, and position status? Does work environment influence the use of ICT? What about the size of the organization's budget and volunteer program, the amount of money invested in the volunteer program, and technical support provided to ICT? These are examples of the kinds of questions we were interested in answering.

To answer these questions, we examined two types of factors: "soft" factors, which are not easily measurable and are subject to interpretation; and "hard" factors, the objective conditions of the volunteer program.

Soft Factors:

Soft factors included: MVRs' perceptions of their autonomy or their latitude to make decisions, job stress or the perceived psychological demands of work and changes in the work environment,³ job satisfaction, and the level of support provided by the organization's leadership and co-workers.

³ Two types of "job stress" were assessed: (1) job stress, which measures psychological work demands such as my job requires that I work very fast; and, (2) job environment stress, which measures psychological demands associated with competitive changes in the job environment in the last 5 years, such as my job is less secure now.

Only three soft factors proved to be statistically significant influences on ICT use. First, we found a positive association between MVRs' perceived job autonomy and their use of e-mail for organizational purposes and of a Web site in their volunteer programs. The greater the perceived job autonomy, the more e-mail was used for organizational purposes and the higher the level of Web site "connectivity" attained. Second, we found a positive association between job satisfaction and e-mail use. The more satisfied MVRs were in their jobs, the more likely they were to use e-mail for organizational purposes. Third, we found a negative association between job environment stress and e-mail use for organizational purposes. The more job stress MVRs perceived in their work environment, the less likely they were to use e-mail for organizational purposes.

Hard Factors:

Hard factors included: the number of ICT changes experienced by the organization, the size of the organization's budget, the percentage of the annual budget allocated to the volunteer program, and the percentage of the volunteer program budget that is allocated to ICT. Other factors related to the volunteer program were the presence of ICT technical support, the position status of managers, the number of volunteers and available volunteer positions, and the number of enquiries about volunteering received in the previous year.

Six hard organizational variables proved to be significant. First, we found that the more ICT changes an organization had experienced, the more e-mail was used for organizational and volunteer management purposes and the more Web sites were used to conduct the work of the volunteer program.

We also found a significant positive association between the amount of the budget allocated to the volunteer program and use of e-mail for volunteer management purposes and the level of Web site

connectivity. An even stronger association existed between the amount of funding received explicitly for ICT applications and the two types of e-mail and Web site use.

Although the total size of the volunteer program was not a factor in ICT use, the number of volunteer position openings and the number of enquiries received for available positions were. The greater the number of volunteer position openings and enquiries, the more likely e-mail was to be used for volunteer management purposes and the higher the level of Web site connectivity.

We also found that MVRs who were themselves volunteers relied heavily on ICT to manage their volunteer resources.

Finally, we found that the larger the size of an organization's budget, the less likely e-mail was to be used to manage volunteers, but the more likely it was to be used for organizational purposes. This suggests that larger organizations, as measured by the size of their budgets, may be more focused on using ICT to meet organizational than volunteer-related needs.

Technical Systems Factors:

To assess the extent to which technical system factors affected ICT usage patterns, we looked at how easy ICT is to learn and the perceived quality and capacity of ICT systems available in the volunteer program.

We found a positive association between ICT systems that were perceived to be "easy to learn" and use of e-mail for organizational and volunteer management purposes. When MVRs perceived ICT systems to be easier to learn, they were more likely to use e-mail for a variety of purposes. However, we found no association between ease of learning and the likelihood of using Web sites or the VOE.

We found a positive association between ICT system quality (as measured by their reliability and dependability, and the amount of control MVRs perceived they had over them) and the use of e-mail for organizational purposes and level of Web site connectivity.

e-mail was to be used to share information with staff and colleagues. Our measure of ICT system quality had no significant effect on the use of e-mail for volunteer management purposes. This suggests that ease of learning is a more important influence than is system quality on the application of e-mail to the management of volunteer programs.

We found that the likelihood of using the VOE was not related to ease of learning or the quality and capacity of ICT systems. This suggests that access to high-quality computers and the Internet, which is necessary to use the VOE, may have less impact on the use of a new type of volunteer-related ICT application than previously thought.

When deciding whether or not to use a new technology or tool such as the VOE, are MVRs influenced by their prior use of ICT systems? We found that prior use of ICT does influence the technology choices MVRs make in their volunteer program. More specifically, a positive association was found between e-mail use as a means to manage volunteers and use of the VOE in recruitment work. This finding suggests that the more ICT is used as a tool to manage volunteers and volunteer programs the more likely new ICT will be used.

Social-Individual Factors:

To assess the extent to which socio-individual factors influenced ICT usage patterns, we examined three sets of factors: (1) the personal characteristics of MVRs, (2) involvement of MVRs in both general and ICT-related decision-making within their organizations and (3) attitudes of MVRs regarding the value they place on ICT and expectations for use of the VOE.

Personal Characteristics of MVRs:

We looked at the impact of gender, age, education, technical ability, length of work experience, and the amount of time spent using ICT at work and home.

When we examined the effect of characteristics, such as gender, age, education, length of work experience, amount of time spent at work, amount of time spent using ICT at home and work, and the technical ability

of the MVR, we found some interesting associations. While we found positive associations between education and ICT use, we found only a weak association between education and use of the VOE. We also found a slight negative association between length of work experience and ICT use, which lends support to an earlier claim that those new to volunteer management are making the most of ICT (Murray and Harrison, 2002).

Male MVRs used their e-mail more often to manage volunteers than did female MVRs. This may suggest that men prefer to use less personal means to manage their volunteers (e.g., through ICT rather than face-to-face). At the same time, we found that male MVRs ran their programs with significantly higher levels of Web site connectivity, meaning their volunteer programs had Web sites with higher levels of capability than did female MVRs. These findings suggest that male MVRs may have more influence on the choice and use of ICT applications in volunteer programs than do female MVRs.

Age and the number of hours worked per week appear to be positively associated with the level of Web site connectivity. Volunteer programs with older

MVRs or MVRs who work more hours per week tend to have higher levels of Web site connectivity than do volunteer programs with younger MVRs and MVRs who work fewer hours per week. This may be an area of concern for organizations that rely on volunteers to manage and coordinate their volunteer programs. Volunteers may have less time to devote to ICT-related issues; as a result, the level of ICT use may be compromised.

It appears that ICT use is most influenced by three personal characteristics of users: their technical ability, the number of hours per week they work, and the amount of time per week that they devote to using ICT. We also found a positive association between MVRs' technical ability and their use of e-mail for both organizational and volunteer management purposes. The same types of associations were found for number of hours

worked, and the percentage of time MVRs use ICT at work and at home. The more time MVRs devote to using ICT and the higher their level of technical ability, the more uses they find for ICT in their volunteer programs.

Influence of Involvement in Decision-making:

To determine the impact of decision-making involvement on ICT use, we examined:

- the extent to which MVRs were involved in making specific decisions about the use of ICT in their volunteer programs and their feelings of ownership over these decisions;
- the extent to which MVRs were involved more generally in organizational decision-making;
- the nature of ICT training that MVRs had received: self-directed, informal (i.e., received from colleagues or acquaintances), or formal (i.e., provided by a volunteer centre, professional association, college, volunteer organization, ICT vendor, or other source); and,
- the extent to which MVRs had participated in the development of VOE, had received training about it, and were involved in evaluating the VOE..

E-mail:

We found that when MVRs are involved in making general and ICT-related decisions, they are more likely to use e-mail for organization and volunteer management purposes. However, this association did not hold in the case of Web site applications.

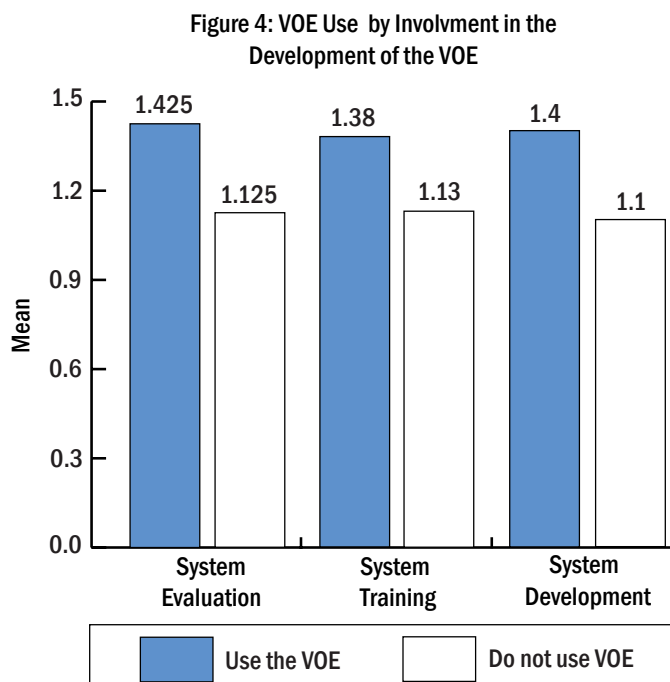
With respect to the influence of training on ICT use patterns, we found that MVRs who had participated in either self-directed, national volunteer centre or vendor training were more likely to use e-mail for volunteer management purposes. Likewise, MVRs who had participated in informal, national volunteer centre, college, or vendor training were more likely to use e-mail for organizational purposes. The strongest association was between e-mail use for organizational purposes and organizational training (i.e., training provided by the workplace).

Web Sites:

We found a negative association between self-training and level of Web site use. MVRs who had trained themselves were less likely to reach high levels of Web site connectivity. However, we found a positive association between vendor training and level of Web site use. This suggests that volunteer programs that use companies to provide their ICT training will have higher levels of connectivity than volunteer programs with less focused training activities.

VOE:

Respondents were asked the extent to which they had been involved in the development of the VOE system, if they had received training on it, and whether they were involved in evaluation processes. We found that MVRs who used the VOE had generally been more involved in these three areas (see Figure 4). Upon further analysis, we found that all three types of involvement were significantly associated with use of the VOE. The more managers were involved in discussions about the quality of the system, had been a part of its development, and had received training in its use, the more they tended to use it to recruit volunteers.



We also examined barriers to VOE use by asking respondents why they were not using the VOE. The two reasons reported most often were I do not know enough about the VOE to make a decision to use it (29%) and I'm not aware of the VOE (28%). Other barriers were: "our local volunteer center provides the recruitment services we need (17%); the VOE does not allow for local recruitment (15%); the VOE does not provide a good source of volunteers (6%); the VOE is difficult to use (2%). This supports the contention that access to a new set of tools is not enough to assure that they will be used. Use also depends on human factors such as the level of knowledge and awareness of how new tools can be applied to an old context (Cravens, 2000; Brock, 2002; Warschauer, 2003).

Expectations of Benefits:

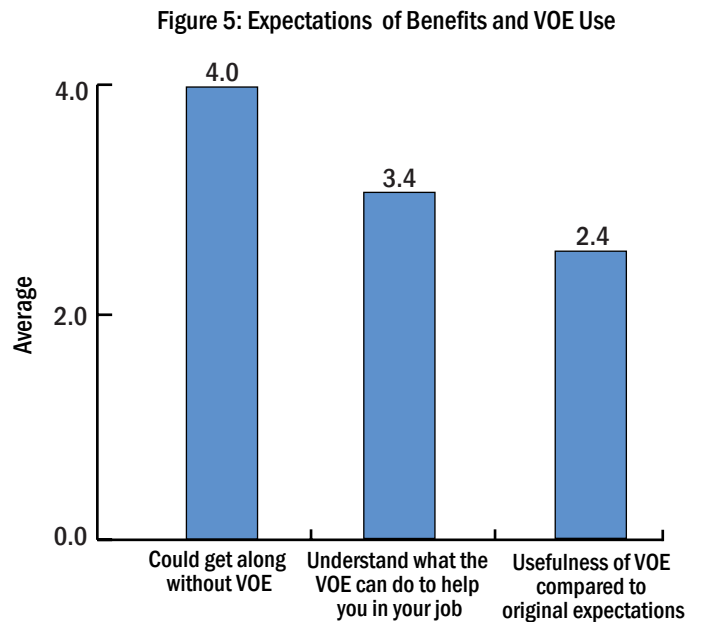
Much of the literature on the success of ICT deals with the role played by users' expectations of benefits and similar attitudes (DeSanctis, 1983; DeSanctis & Poole, 1994; Franz & Robey, 1986; Davis, 1989; Seddon & Kiew, 1994; Seddon, 1997). We asked MVRs to rate on a five-point scale, where 1 represents not at all and 5 represents very much, the importance, relevance, and appeal of ICT to them personally. We also asked them to identify the degree to which they found ICT interesting or boring, trivial or fundamental, and mundane or fascinating. We asked VOE users about their understanding of how VOE could help them in their jobs, and to compare their actual usage of the VOE to their original expectations. Given our research method we were unable to measure expectations prior to use.

We found that perceptions of ICT usefulness were significantly associated with the use of e-mail for organizational and volunteer management purposes. The more useful MVRs perceived e-mail to be, the more uses they found for it.

We found a weak positive relationship between perceived usefulness of ICT and use of the VOE. A stronger association was found between MVRs' expectations of the VOE and the use of other online

recruitment systems. This suggests that MVRs who have positive attitudes toward use ICT and the VOE are more likely to have used the VOE or other similar applications.

As seen in Figure 5, MVRs appear to have a good understanding of the VOE system and what it can do to help them (average rating of 3.4 on a five-point scale where 1 is not at all and 5 is very much), However, their perceptions of its usefulness compared to their original expectations are much lower (2.4). MVRs also agreed that they could get along without the VOE (4.0), which suggests that those who have used the VOE do not have a very positive impression of it.



Major Factors Associated with Perceived ICT Effectiveness

Throughout this report, we have identified a number of factors as being associated with the use of ICT. But how effective has ICT been in improving volunteer programs? For example, what factors are associated with perceptions of ICT effectiveness in saving time and bringing in new volunteers? What factors are associated with ICT effectiveness in reducing the cost and increasing the efficiency, productivity, service quality, and overall significance of volunteer programs?

To answer these questions, we used our model to test which factors influence MVRs' perceptions of ICT effectiveness. Only those that were found to be significantly associated with perceived effectiveness of ICT and the VOE are reported below.

Organizational Systems Factors:

As was the case with ICT use, both soft and hard factors affect ICT effectiveness patterns. For soft organizational influences, we found a positive association between the level of perceived job autonomy and perceptions of ICT effectiveness. We also found that job stress and satisfaction were positively associated with perceptions of effectiveness. In other words, in environments where ICT is perceived to have the most impact, MVRs perceive themselves to be working very hard, to have autonomy to do their work, and to be very satisfied with their work.

- **Expectations of Benefits:** We were also interested in the extent to which positive or negative attitudes or expectations influenced ICT effectiveness. During our focus groups and personal interviews, we uncovered specific terms, including “the blockers,” “the red light people,” and “the dinosaurs,” to describe those with negative attitudes toward ICT. In our earlier research (Murray & Harrison, 2002), we became aware that some end-users, including volunteers who were new to volunteering and managers who were

new to volunteer program management, were more inclined than others to want to use ICT. We tried to determine the association between attitudes and ICT effectiveness by examining the relationship between MVRs' perceptions of the usefulness of ICT in volunteer programs and its perceived impact on volunteer program costs, efficiency, productivity, service quality, and volunteer program significance. We also examined the relationship between the extent to which MVRs who had used the VOE understood what it can do and how they had actually used it compared to their original expectations.

We found a positive relationship between the value or perceived usefulness of ICT and its perceived impact on the effectiveness of the volunteer program. Similarly, there was a weak positive association between perceptions of ICT usefulness and use of Volunteer Canada's VOE system to recruit volunteers. We found a stronger association between MVRs' expectations for the VOE and their perceptions of its effectiveness. These findings lend support to the theory that ICTs are used because the end user certain expectations of benefits (DeSanctis, 1983; Franz and Robey, 1986; Seddon, 1997). Those who use ICT systems in the volunteer program are more likely to believe they are of value to them in meeting the demands of their work than those who do not use ICT systems. These findings also suggest that attitudes influence whether ICT is used and its perceived impact on volunteer programs. The more positive the attitude towards ICT, the more MVRs expect from and use it.

However, we found no significant association between these variables and perceptions of VOE effectiveness. This suggests that soft organizational factors have less influence on the use of external ICT applications specific to volunteers like the VOE.

The hard factor that had the strongest impact on ICT effectiveness was the percentage of the

volunteer program budget that was allocated to ICT. Also strongly associated with perceived effectiveness were the presence of ICT support for the volunteer program and the size of a voluntary organization's annual budget. These findings suggest that as volunteer programs become better resourced (i.e., have access to more money and technological support) MVRs are more likely to perceive ICT as having a positive impact.

We found no association between hard influences and VOE effectiveness.

Technical Systems Factors:

The quality of ICT also appears to have an impact on perceptions of effectiveness. More specifically, ICT that is perceived to be easy to learn or of high quality (i.e., rarely breaks down) is associated with positive perceptions of ICT impact on the volunteer program.

Social-Individual Factors:

- **Background Characteristics:** The background characteristics of MVRs that are positively associated with ICT effectiveness are time at work, and time spent using ICT, and technical ability. The only association we found between individual characteristics and the perceived effectiveness of the VOE was the amount of time spent using ICT at work.


These findings suggest that success of a system depends on how much time MVRs devote to using it; and that external ICT systems, such as the VOE, may be less sensitive than internal ICT systems to the background characteristics of the individuals who use them.

- **Involvement in Decision-Making:** MVRs' involvement in decision-making has the same impact on perceptions of ICT effectiveness as it had on usage patterns. ICT is perceived as more effective by MVRs who have ICT decision-making responsibilities. We also found, although to a lesser extent, that training provided by a professional volunteer management association was associated with ICT effectiveness patterns.

The extent of MVRs' involvement in the VOE (whether they were involved in developing and evaluating it and whether they had received training on it) was positively associated with the perceived effectiveness of the VOE. More specifically, VOE effectiveness patterns were positively influenced by involvement in ICT training opportunities provided by national or local volunteer centres or MVR professional associations, and with training and evaluation that is specific to the VOE application. These findings are not surprising since the VOE application is a product of Volunteer Canada, and is available to local volunteer centres. As a result, many local volunteer centres promote the VOE to their member organizations.

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Predictors of ICT Use and Effectiveness

In our earlier analyses we reported on simple two-variable associations between different types of factors in our model (organizational, technical and socio-individual) and ICT use and effectiveness. The analyses we report below are a result of more complex multivariate analyses that combined all of the variables in our model to see which of them best predict the dependent variables designed to measure ICT use and perceived effectiveness.

We do not suggest that these “predictors” somehow replace previous findings. All of the findings are valid and managers will want to pay attention to them. The predictors should be thought of as findings that “stand out.” In fact, the literature supports that there will be multiple measures of success and the key is to “systematically combine” and measure them (DeLone & McLean, 1992, p. 87) in different organizational and usage contexts (Seddon, Staples, Patnayakuni, & Bowtell, 1999, p. 166).

Level of Web Site Connectivity:


Of the factors we found to be associated with Web site connectivity, only two turned out to be significant predictors. These were: the percentage of the volunteer budget allocated to ICT at the organizational systems level and the age of the MVR at the social-individual level. Not surprising, for every percentage increase in the volunteer program budget allocated to ICT, there is an increase in Web site connectivity in the volunteer program. The same is true for age of the MVR and the level of Web connectivity: the older the MVR, the higher the level of connectivity. These findings suggest that money and age are important contributors to development of Web site capability in volunteer programs. These findings also lend support to the claim that volunteer programs are not free and that investment in them yields benefits.

E-mail Use for Organizational Purposes:

We found only two predictors for e-mail used for organizational purposes: the use of e-mail for volunteer management purposes at the technical systems level, and a slight negative relationship with job environment stress, at the organizational level. In other words, the more e-mail is used for volunteer management purposes, the more it is also used for organizational purposes. A concern, however, is the possible impact of stress in the job environment on e-mail use. The more MVRs experience job stress, the less they use e-mail for organizational purposes. This finding lends support to what has long been suspected: that the conditions of the work environment having an impact at the individual level with respect to the implementation of technological changes (Theorell & Karasek, 1996; Turnage, 1990 as cited in Erez & Earley, 1993, p. 6; Landsbergis, Cahill & Schnall, 1996).

E-mail Use for Volunteer Management Purposes:

We found significant predictors for e-mail used for volunteer management purposes at all three levels of analysis. At the organizational systems level, the size of the volunteer program budget was significant: the larger the volunteer budget, the more e-mail is used in the management of volunteers. This may mean that in larger volunteer programs with larger budgets, busy managers have found e-mail a useful means of communicating with volunteers. It may also mean that the staff of programs with larger budgets are more likely to be accessible by e-mail. At the social-individual level, a significant predictor was the amount of time spent using ICT at work. At the technical systems level, e-mail use for organizational purposes was the most important predictor, followed by using ICT systems that are perceived to be easy to learn, and use of the VOE. Managers who spend more time at work using ICT, and who work with technology



that they consider easy to learn, are more likely to use e-mail for volunteer management. And, other things being equal, managers who use the VOE are more likely than those who don't to use e-mail for volunteer management purposes. Together, these results suggest that using ICT for one purpose may lead to using it for related purposes. Thus, using e-mail to deal with organizational matters leads to using it for volunteer management purposes (when the communication channels allow it). Using ICT to recruit volunteers leads to new ways of using ICT to manage them.

VOE Use:

We found three significant predictors of VOE use. At the social-individual level, perceptions that ICT is useful was the strongest predictor, followed by use of e-mail for volunteer management purposes at the technical systems level. At the organizational systems level, we found a negative association between position status and VOE use. Other factors being equal, MVRs who are volunteers are more likely than are salaried MVRs to use the VOE in their recruitment work. It is possible that volunteer MVRs have a better appreciation for volunteering, and therefore a better understanding of the VOE.

Predictors of ICT Effectiveness

ICT Effectiveness:

Factors affecting ICT effectiveness include the impact of ICT on cost reduction, productivity, efficiency, service quality, and significance of a volunteer program. Predictors of ICT effectiveness were found at both the organizational systems and social-individual levels. At the organizational level, the percentage of time MVRs spend using ICT on the job, followed by job autonomy, were the most important predictors. The first predictor is consistent with results reported above about usage: the greater the use of ICT, the greater the perceived benefit, and vice versa. The second predictor may mean that managers with greater job autonomy actually feel that they use ICT more effectively. This would be consistent with the body of evidence that indicates that job autonomy can have positive impacts on workplace productivity (Hackman & Oldham, 1980).

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At the social-individual level, we found that the perceived usefulness of ICT had a weak impact on perceived effectiveness. On one hand, it may seem obvious that as the perceived usefulness of ICT increases so, too, does the perception that ICT is having a positive impact on effectiveness. On the other hand, this suggests that usefulness is perceived not simply in terms of local impact (e.g., saving the individual time and effort), but also in terms of overall effectiveness of a program.

VOE Effectiveness:

VOE is a relatively new application with a specific purpose: volunteer recruitment and placement.

Consequently, the effectiveness of the VOE was more specifically defined than that of ICT in general, and focused on resource savings and effectiveness in recruiting and matching volunteers to positions. We found two significant predictors of VOE effectiveness, both at the social-individual level. The most important was the perceived usefulness of the VOE. This is consistent with the similar finding reported above for ICT effectiveness. The second significant predictor was involvement in ICT training provided by a national or local volunteer centre or a professional association of administrators of volunteers. This may mean that training for more generic ICT applications is also important for special purpose applications dedicated to volunteer management tasks. Because the VOE is owned by Volunteer Canada and promoted by local volunteer centres, this finding may also mean that sources closest to the application's development and distribution may be in the best position to provide support for using it.

Involving Others in the VOE:

Finally, we examined what factors would predict whether or not an MVR would involve others in use of a new ICT application like the VOE. We found only one significant predictor: positive perceptions of the effectiveness of the VOE. This finding suggests that as perceptions of the value of new ICT like the VOE increase, so too does the tendency to encourage and involve others in using it.

Conclusion

Our analysis suggests that there may be an ICT “effectiveness divide” in the sample of Canada’s volunteer programs that we studied. This problem stems not from being “inadequate” users of ICT but rather from factors that impact the success of ICT at organizational, technical, and social-individual levels. The fact that we found multiple measures responsible for the effective use of ICT is not uncommon and has been identified in the success literature (DeLone and McLean, 1992; 2002; Seddon et al., 1999). In fact, the literature is becoming clear that “different stakeholders and different types of systems require very different measures of IS effectiveness” (Seddon et al., 1999, p. 166).

The purpose of this study was to provide answers to two basic questions about ICT use in Canadian volunteer programs: what affects the amount and type of ICT used, and what affects MVRs’ perception of the effectiveness of ICT. With respect to the first question, we found that different factors at different levels of analysis influenced not only the type of ICT used, but also the level of use and its application. For example, factors in the organization’s environment influenced the use of e-mail for organization-related purposes more than they influenced its use for volunteer management purposes. We also found that use of a new ICT, like the VOE, was influenced by prior use of ICT for the purpose of volunteer management. And, that uptake of the external VOE application could be impacted by geography or the region in Canada in which the user organization is situated. With respect to the second question, we found that general perceptions of ICT effectiveness were influenced by job autonomy and time available to use ICT, while ICT applications specific to volunteers, such as VOE, were influenced by social factors such as involvement in training.

The issue of increasing ICT effectiveness is a relatively new one for voluntary organizations. Using ICT effectively (i.e., using it for multiple purposes such as organizational and volunteer demands) can

be challenging. It can be particularly daunting for organizations that rely solely on volunteers. While these organizations tend to use ICT in ways that meet the needs of volunteers, lack of attention to organizational factors may put them at risk for failing to meet organizational demands. The opposite may be true for organizations that rely on professional managers in their volunteer programs. The priorities of these managers may be organizationally driven. Failing to meet the needs of volunteers may put them at risk of failing to meet organizational demands for volunteer involvement.

Volunteer organizations that want to enhance the use and effectiveness of their volunteer programs should consider the following:

- Leaders of nonprofit and voluntary organizations should seek the support of managers of volunteer resources in meeting new job demands by involving them in discussions about how they could use ICT in the management of volunteer programs from both organizational and volunteer management perspectives.
- Managers of volunteer resources should work with their supervisors to create job designs that allow them more autonomy and time to use ICT. MVRs may want to re-think their work to ensure that they are making the most of what ICT has to offer. Thought could be given to using ICT in ways that replace some of the traditional tasks that managers perform. For example, tasks could be divided between managers and volunteers, with managers focusing on developing ICT capability and infrastructure (e.g., using Web sites to a greater degree) while volunteers perform volunteer-related tasks.
- Leaders of nonprofit and voluntary organizations and managers of volunteer resources should recognize that the introduction of ICT might be disruptive to the traditional environment in which the organization has operated. To increase use and effectiveness

of ICT, leaders and managers may want to focus on strategic management of ICT, and pay attention to the factors that impact success at organizational (can we support ICT?), technical (do we have the right systems?), and socio-individual (what about our people and involvement?) levels.

- There is a need for performance assessment and evaluation of how ICT is being used in volunteer programs. Individual volunteer programs should assess how they are using ICT to (a) identify where there are potential weaknesses, and (b) develop strategies to increase their effectiveness.
- Managers of volunteer resources should keep records of their ICT use and share their ICT stories and measures of success, possibly through regional representatives or groups associated with the Joint Table on Information Management and Information Technology (IM/IT) of Canada's Voluntary Sector Initiative (VSI).
- The issue of the digital divide is a matter of concern and topic of public policy for the Government of Canada and leaders of the voluntary sector, who are working together through the VSI Joint Table on IM/IT to increase access to ICT. Our research reveals that while many organizations have access to ICT, there may be capacity variations across Canada, as indicated by the level of VOE uptake, with some organizations clearly more ahead in their use of new ICT than others. With our knowledge of the cumulative nature of ICT use in volunteer management, this finding is a concern that could result in a gap between "have" and "have not" organizations. As a result, there is a need for further investigation into why this problem exists and ICT capacity building strategies that target under-represented ICT regions in Canada.

Many managers of volunteer resources may wonder about the impact of not making the best use of the ICT opportunities available to them. In a time of rapid

technological change, increased competition for scarce resources, and accountability demands from many stakeholders, failure to pay attention to this divide may put some voluntary organizations at a disadvantage relative to organizations that have successfully adopted these tools of modern management.

When it comes to administrative practices within organizations, inadequate ICT use can lead to overall losses in organizational efficiency and effectiveness. Within volunteer programs specifically, at a time when the rate of volunteering has been on the decline in Canada (Hall, McKeown, & Roberts, 2001), organizations that fail to meet the needs of individual volunteers may lose them to those organizations that are taking full advantage of the ways in which properly implemented ICT systems can be used to attract and retain volunteers.

The intention of this report was to provide information to volunteer organizations and their managers that would enable them to be more effective in their use of ICT, and to raise awareness of the different types of factors that could be impacting the use of ICT and the effectiveness of their ICT choices.

References

- Brock, K. L., *Antagonists and Allies: Voluntary Organizations, Business and the Policy Process*, Paper presented at the Institute of Public Administration of Canada Meetings, Halifax, August 27, 2002.
- Clarke, S. (2001). *Information Systems Strategic Management*. London: Routledge.
- Cravens, J. (2000). *Virtual Volunteering: Online Volunteers Providing Assistance to Human Service Agencies*. *Journal of Technology in Human Services*, 17 (2/3), pp. 119-136.
- Davis, F. (1989). *Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology*. *MIS Quarterly*, (3), 319-240.
- DeLone W., & McLean, E. (1992). *Information Systems Success: The Quest for the Dependent Variable*. *Information Systems Research*, 3, 319-340.
- DeLone, W., & McLean, E. (2002). *Information Systems Success Revisited*. *Proceedings of the 35th Hawaii International Conference on System Sciences*, 1-11.
- DeSanctis, G. (1983). *Expectancy Theory as an Explanation of Voluntary Use of a Decision-Support System*. *Psychological Reports*, 52, 247-260.
- DeSanctis, G., & Poole, M., S. (1994). *Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory*. *Organization Science*, 5(2), 121-147.
- Erez, M. & Earley, C. P. (1993). *Culture, Self-Identity, and Work*. New York: Oxford University Press.
- Franz, C., & Robey, D. (1986). *Organizational Context, User Involvement, and The Usefulness of Information Systems*. *Decision Sciences*, 17, 329-356.
- Garrity, E. J., & Sanders, G. L. (Eds.). (1998). *Information Systems Success Measurement*. Hershey: Idea Group Publishing.
- Government of Canada, *VolNet Final Report, 2002*: retrieved on June 16, 2003, http://www.volnet.ca/e/final_report_e.asp.
- Hackman, R., & Oldham, G. (1980). *Work Redesign*. Mass: Addison-Wesley.
- Hall Aitken (2001, November). *E-Enabling the Voluntary and Community Sectors*, Final Report. [Glasgow]: UK Government Online, Office of the E-envoy (Publisher).
- Hall, M., McKeown, L. & Roberts, K. (2001). *Caring Canadians, involved Canadians: Highlights from the 2000 National Survey of Giving, Volunteering and Participating* (Catalogue No. 71-542-XPE). Ottawa: Statistics Canada
- Landsbergis, P.A., Cahill, J. & Schnall, P., (September 17, 1996). *New Systems of Work Organization: Impacts on Job Characteristics and Health*, retrieved March 16, 2003 from, <http://www.workhealth.org/whatsnew/lpnewsys.html>
- Murray, V., & Harrison, Y. (2002). *The Impact of Information and Communications Technology (ICT) on Volunteer Management*. Toronto: Canadian Centre for Philanthropy.
- Nonprofits Policy and Technology Project. (1998, December). *Speaking Up in the Internet Age: Use and Value of Constituent E-mail and Congressional Web Sites*. [Washington, D.C.]: Author.
- OECD. (2000, June 14). *Is there a New Economy? First Report on the OECD Growth Project*. [Paris]: Author.
- OECD. (2000, September). *Science, Technology and Innovation in the New Economy* (Policy Brief). [Paris]: Author.

- Pargmegiani, M., & Sachdeva, T. (2000, September). *Information and Public Policy Concerning Voluntary Sector Use of Information Technologies, the Internet and the World Wide Web: An International Report*. Toronto: Canadian Centre for Philanthropy.
- Pitkin, B., & Manzo, P. (2002, November 14). *The IT Revolution and Nonprofit Organizations in Los Angeles*. Paper Presentation to the ARNOVA Conference, Montreal, QC.
- Saidal, J. R., & Cour, S. (2003). *Information Technology and the Voluntary Sector Workplace*. *Nonprofit and Voluntary Sector Quarterly*, 32(1), 5-24.
- Schneider, J., (2003). *Small, Minority-Based Nonprofits in the Information Age*. *NonProfit Management and Leadership*, 13(4), 383-399.
- Seddon, P. B. (1997). *A Re-Specification and Extension of the DeLone and McLean Model of IS Success*. *Information Systems Research*, 8 (3), 240-254.
- Seddon, P., Graeser, V., & Willcocks, L. (2002). *Measuring Organizational IS Effectiveness*. *ACM SIGMIS Database*, 33(2), 11-28.
- Seddon, P. B., & Kiew, M. (1994). *Partial Test and Development of the DeLone and McLean Model of IS Success*. *Proceedings of the International Conference on Information Systems*, Vancouver, B.C., 99-110.
- Seddon, P., & Staples, D. S., Patnayakuni, R., & Bowtell, M. (1999). *Dimensions of IS Success*. *Communications of the AIS*, 20(s), 165-176.
- Theorell, T. & Karasek, R. A. (1996). *Current Issues Relating to Psychosocial Job Strain and Cardiovascular Disease Research*, *Journal of Occupational Health Psychology*, 1(1), p. 9-26.
- Ticher, P., Maison, A., & Jones, M. (2002). *Leading the Way to...ICT Success*. London: The Baring Foundation.
- Volunteersonline. *Making IT Work for Volunteers*. Retrieved October 15, 2002, from www.volunteersonline.ca/news/environmentalscan.htm
- Warschauer, M. (2003). *Technology and Social Inclusion: Rethinking the Digital Divide*. Cambridge: MIT Press.

