

## Information and Communications Technology: Navigating Technological Change and Changing Relationships in Volunteer Administration

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For volunteer administrators who scan the more popular nonprofit technology Web sites, such as Tech Soup or Charity Village,<sup>1</sup> the number of applications for modern information and communications technology (ICT) may seem overwhelming and confusing.

Some examples of the areas where ICT is being used in nonprofit work include capacity building and policy development (Government of Canada, 1999; Nonprofits Policy and Technology Project, 1998); advocacy (McInerney, 2004); fundraising (Johnson, 1999; Warwick, Hart & Allen, 2002); philanthropy (Blau, 2001); volunteer recruitment and management (Ipsos Reid, 2001; Murray & Harrison, 2002a); volunteering (Cravens, 2000; Murray & Harrison, 2002b; Virtual Volunteer Project, 2001); community development (Seedco, 2002); and management education (Cargo, 2000) just to name a few.

While the introduction of ICT into the nonprofit sector is thought to be helpful to nonprofit organizations (NPOs) in finding new ways to meet their missions, it does, at the same time, present significant challenges (Brock, 2002; Schneider, 2003). For example, little is known about the types of applications, and to what extent these applications are used, in volunteer program work. Nor is much known about what factors influence

ICT decisions and in what ways ICT applications should be managed for success.

Drawing from the literature and our research on ICT use in Canadian volunteer organizations, this article argues that if volunteer programs are going to be successful users of modern ICT, then greater emphasis must be placed on understanding its uses and the factors that influence its effectiveness in volunteer program work. Our argument will be built around the following questions:

1. What is information and communications technology?
2. How significant is it?
3. What are the common types of ICT applications in volunteer programs and to what extent are they used?
4. What factors influence the use of ICT applications in volunteer administration?
5. So what? How can volunteer administrators create a supportive climate for ICT?

### 1. WHAT IS INFORMATION AND COMMUNICATIONS TECHNOLOGY?

ICT is a combination of three modern electronic components: computer hardware, software applications, and the Internet. Like the manufacturers that produce them, each of these components plays a different role in processing information and facilitating com-

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munications. For example, computers store, microchips process, and networks make possible the transmission of information within a social environment. While each of these components has a separate and unique function, they work in concert to form what is known as the electronic information and communications technology system (Clarke, 2001).

Like other types of technology that have come before them, ICTs can be thought of as a set of tools to achieve specific goals, a "means to an end" approach (Richter, 1982, pg. 8). But technology should also be thought of in terms of the knowledge and know-how to achieve specific objectives (Richter, 1982, pp. 7). In thinking about technology in these two ways, it is not hard to imagine different types of technology that have been used at different points in time by organizations to conduct their work and achieve their objectives. In fact, organizations, like societies, have long been described and characterized on "the basis of their knowledge and the technologies available to them" (Richter, 1982, p. 20). For example, machine technologies characterized the industrial era, and ICT has spawned what we now call the information age.

Originally, computers were used as machines for doing a lot of routine work faster and better, such as keeping records and sending out bills. Then it was realized that their vastly superior information-processing capacity could be used for making important management decisions. However, with the relatively recent advent of the Internet and web-based technologies, it has become an important means to facilitate different kinds of work (e.g., e-commerce, e-business and e-government) as well as in building and sustaining relationships between people (Checkland & Holwell, 1998; Warren & Weschler, 1999).

Based on our review of the literature and our research into how volunteer programs are making use of ICT, we therefore want to separate our discussion of ICT into two components:

1. ICT that is used primarily for the purpose of "doing for," that is, it is used to carry out specific *tasks* more efficiently or effec-

tively (e.g., recruitment of volunteers, fund-raising) to aid or benefit the voluntary organization in meeting its mission.

2. ICT that is used primarily for the purpose of "doing with," that is, it is used to build and manage relationships to increase *trust*, develop mutual *respect*, improve motivation and build teams (e.g. e-mail that provides volunteer recognition, online newsletters and Web sites that host discussion forums).

## 2. HOW SIGNIFICANT IS IT?

In Canada, the authors of this article carried out several surveys of volunteer administrators between 2001 (n=494) and 2003 (n=462)<sup>2</sup> asking them questions about how much access they had to ICT components in their volunteer programs. The data for this paper comes from three different respondent groups. The first group, the "2001 local group," consisted of administrators of volunteer programs who were members of Volunteer Victoria, a volunteer support and referral organization covering the Capital Regional District of Victoria, B.C. Canada.<sup>3</sup> The second group, the "2001 national group," consisted of administrators from across Canada who were registered users of Volunteer Canada's Volunteer Opportunities Exchange (VOE), an online recruitment system used to increase volunteerism in Canada.<sup>4</sup> The third group, the "2003 national group," consisted of administrators who were on an updated electronic listing of registered VOE users, and administrators who were on the mailing lists of a number of local volunteer centres across Canada.<sup>5</sup> The local group of administrators responded to mail questionnaires while both national groups responded to online questionnaires.<sup>6</sup>

As of 2003, the amount of access that volunteer administrators had to ICT components was high, and in most cases levels had increased over the two years we conducted assessments. Highlights of the data indicate

- The majority of volunteer programs had access to personal computers (up to 99% in 2003 from 89% of the national group and from 94% of the regional group) and fax machines (up to 92% from 87% local-

- ly and nationally).
- Less than a third of administrators reported using specialized volunteer management software to manage their volunteers. (By 2003 this figure was up slightly at 31% nationally from 29% nationally and 15% locally.)
- Use of the Internet in the volunteer program was high (2003 up to 100% nationally from 95% nationally of those we surveyed by e-mail and 90% among the local administrators we surveyed by mail). These findings are not surprising given both national groups were biased in favour of Internet use. The local group may be more typical of the amount of access volunteer programs in the sector have.
- Volunteer administrators were not big users of cellular phones (up to 37% in 2003 from 35% nationally and 15% locally in 2001) or handheld computers (up to 10% in 2003 from 2001 levels of 1% regionally; 6% nationally).

In summary, our findings suggest that volunteer administrators in Canada, while they did not have access to all the “toys,” were certainly not laggards in the ICT tool department. These findings are consistent with other nonprofit research coming out of Canada (e.g., Government of Canada, 2002; Kerr, 2002; Murray & Harrison, 2002; Parmegiani & Sachdeva, 2000); the U.S. (e.g., Nonprofits Policy & Technology Project, 1998; Pitkin & Manzo, 2002); and the UK (e.g., Hall Aitken, 2001; Ticher, Maison and Jones, 2002) suggesting that physical access to ICT components in these types of organizations in developed countries at least is very high.

### 3. WHAT ARE THE COMMON TYPES OF ICT APPLICATIONS USED IN VOLUNTEER PROGRAMS AND TO WHAT EXTENT ARE THEY USED?

Table 1.0 shows the different types of ICT applications volunteer administrators from our samples reported using during the years 2001-2003. The applications we looked at were aimed at informing prospective volunteers about the volunteer program and

available opportunities, locating potential volunteers (recruitment), selecting and putting them into positions, and overseeing their performance. This meant examining the use of organizational Web sites, e-mail, online volunteer opportunity recruitment systems, virtual volunteering<sup>7</sup> and how software applications were used for managing volunteers.

Along with general reports on the amount of access to these applications, in some cases we also looked at how applications were used. For example we looked at the ways Web sites were used in volunteer programs. Different uses represent different “levels of connectivity”. Some were used simply to inform potential volunteers about the volunteer program (level 1-information hosting) while others were interactive, allowing potential volunteers to apply online or communicate with the organization (level 2-interactivity). At a more advanced level a few Web sites allowed the sharing of work, or information, with colleagues in their own organization or even others (level 3-vertical and horizontal work sharing). We assessed whether e-mail was used only for communicating among staff and colleagues within and between organizations (type 1) or for communicating with volunteers (type 2). In the same fashion, we looked at the use of two different Canadian online recruitment systems to search for and match volunteers to available positions. Two of the better-known systems are the VICTA program developed by Volunteer Victoria and adopted by about 50 volunteer centres across North America; and, the Volunteer Opportunity Exchange (VOE) started in 1998 by Volunteer Canada.<sup>8</sup> Finally, we report on uses of software applications and the extent to which volunteer programs had volunteer positions that could be performed from a distance using ICT (known as virtual volunteering, or VV).

Table 1 shows the amount of ICT use by the three samples of volunteer administrators that we studied: the national and local samples measured in 2001 and the national sample measured two years later in 2003. It reveals the following ICT usage patterns:

**TABLE 1****Use of ICT Applications by Volunteer Administrators in Canadian Volunteer Programs**

<b>ICT Application Type</b>	<b>National 2001 % (n) n=365</b>	<b>Local 2001 % (n) n=129</b>	<b>National 2003 % (n) n=462</b>
<b>Organizational Web site</b>	90 (330)	78 (98)	90 (415)
<b>Level of Web site Connectivity</b>			
Level 1-information hosting	79 (225)	85 (58)	70 (257)
Level 2-level 1 plus interactive features	19 (54)	12 (8)	20 (75)
Level 3-level 2 plus vertical and horizontal shared database	2 (6)	3 (2)	10 (35)
Use Internet to search for volunteers	64 (235)	55 (71)	N/A
Use of VOE	34 (124)	8 (10)	28 (128)
Use of VICTA recruitment system	N/A	47 (77)	N/A
<b>Use of E-mail in Volunteer Program</b>	96 (349)	76 (87)	100 (461)
Type 1 E-mail used only within org	94 (342)	99 (91)	99 (458)
Type 2 E-mail used for volunteer communication	88 (320)	85 (78)	93 (430)
<b>Uses for Software Applications:</b>			
Writing	99 (363)	98 (124)	N/A
Communicating	90 (328)	88 (110)	N/A
Record Keeping	89 (325)	83 (104)	N/A
Scheduling	50 (181)	47 (59)	N/A
<b>Use of ICT to Volunteers:</b>			
Virtual Volunteering	34 (124)	33 (42)	N/A

**Use of Web sites**

- Over three quarters of administrators in 2001 had access to Web sites (90% national sample; 78% local). There was no change in Web site access between two national samples taken two years apart (2001 and 2003 were both 90%). This suggests some stabilization in the rate of adoption of this technology.
- The majority of Web sites were at the lowest level of e-connectivity, using them just to host information about their volunteer programs (2003 level 1 connectivity was 70% compared to the 2001 samples which were 79% national and 85% local.) Local administrators reported the lowest levels of e-connectivity (85% at level 1). Clearly, the potential for using Web sites to get work done or build relationships was still not recognized.
- However, the trend is on the upswing. Volunteer programs in 2003 had reached higher levels of connectivity than those in 2001 (2003 level 3 at 10% compared to 3 or less percent nationally and locally).

**Use of Online Recruitment Systems**

- Over half of volunteer administrators (64% national; 55% local) reported using the Internet in 2001 to search for volunteers.
- Though overall usage was low, more volunteer administrators used the national online recruitment system (VOE) in 2001 (34%) than they did in 2003 (28%). Of the national administrators who did not use the national system in 2003, 63% cited lack of knowledge about it as the primary reason for not using it; 7% didn't use it because they felt their local volunteer centre could provide the recruitment services they needed, while only 5% had a general belief that online recruitment systems were not a good source of volunteers.
- In the sample of local administrators, 47% used their locally based online recruitment systems while only 8% of them used the national system. Of the local managers that did not use the national system, 71% said they were interested in learning more about it.

### Use of E-mail

- For each of the years assessed, administrators used e-mail mostly for 'organizational' purposes such as sharing information with management and staff, and tasks from a distance (2001, 94% national and 99% local; 2003, 99% national. The mean usage score was 4.22 out of 5 where 1 is *never use* and 5 is *use very much*). E-mail was used somewhat less for communicating with volunteers (88% of the 2001 national sample; 85% of the 2001 local sample; and 93% of the 2003 national sample). The mean usage score was 3.67 out of 5.

### Use of Software

- The majority of administrators from our 2001-2002 samples used software applications to write letters, reports and other documents (99% national; 98% local) and communicate (90% national; 88% local) or keep records (89% national; 83% local) on volunteers. Fewer used software to assist with the task of scheduling volunteers (50% national; 47% local).

### Use of ICT to Volunteer

- About a third of administrators (34% national and 33% local) in 2001 had volunteer positions that could be performed from a distance using ICT in whole or in part (known as virtual volunteering, or VV).

In summary, it appears that the amount of access to ICT applications like Web sites, e-mail, and online recruitment systems did not change all that much over the two years we conducted assessments. But we do see some variation in the use of these applications. For example, Web sites reached higher levels of connectivity in 2003, suggesting that Web sites are being seen not only as tools to host information about the volunteer, but also as a way to facilitate its work. We also see changes in e-mail use with ICT being used in 2003 as a tool to manage volunteers more than in previous years. The comparatively low use of national online recruitment systems and the reasons cited by administrators for this suggests that lack of knowledge about their

potential value to volunteer administration might be a major factor to explain the low level of uptake. The same may be true for VV positions. Regarding the use of software, the pattern suggests that administrators see these applications more as tools for writing, communicating and record keeping rather than for managing volunteers.

### 4. WHAT FACTORS INFLUENCE THE USE OF THESE APPLICATIONS IN VOLUNTEER ADMINISTRATION?

While we were interested in knowing how much and in what ways administrators were using ICT applications, we were also interested in whether certain factors might account for the variation in ICT use between volunteer programs.

To accomplish this, we assessed a large number of factors. They are grouped into three categories: (1) at the organizational systems level, "*hard characteristics of volunteer organizations*" such as the sector they are in (e.g., social services, the arts, health, etc), size (represented by budget size), size of volunteer program (represented both by the number of volunteers and size of the volunteer program budget and how much of that money was allocated to ICT), the extent to which there were ICT changes, and "*soft characteristics of the job environment*" (level of job autonomy, satisfaction, leadership, and co-worker support); (2) *characteristics of technology*, which included the quality and capacity of ICT systems, system satisfaction, and use of ICT applications; (3) *individual characteristics of volunteer administrators* (e.g., age and education, experience in the job, time using ICT, level of technical ability, attitudes toward ICT and specific types of applications) and *social characteristics of the environment* (e.g., the extent to which they were involved in ICT and organizational decisions).

Using our 2003 data we found a number of factors were associated with the different uses of ICT and their perceived impact on the volunteer program by volunteer administrators (See Appendix A for a list of these correlations).<sup>9,10</sup> Only a few factors were significant predictors.

From Table 2 it can be seen that different

**TABLE 2**  
**Predictors of ICT Usage and Effectiveness Patterns in Canadian Volunteer Programs**

	Web site Use Level of Connectivity	E-mail Use Organizational Purposes	E-mail Use Volunteer Management	Online Recruitment System Use (VOE)	Online Recruitment System (VOE) Impact	ICT Impact
<b>Organizational Level Predictors</b>	The greater the % budget allocated to ICT, the higher the level of e-connectivity.	The more stress in the job environment, the less e-mail is used for organizational purposes.	The greater the size of the volunteer program budget, the more e-mail is used to manage volunteers.			The greater the level of administrator job autonomy, the greater the perceived impact of ICT on the volunteer program.
<b>Technical Systems Predictors</b>		The more e-mail is used to manage volunteers; the more it is used for organizational purposes.	The easier ICT systems are to learn, the more they are used for volunteer management purposes.  Administrators who use online applications to recruit volunteers are more likely to use e-mail applications to manage them.  Administrators who use e-mail for organizational purposes are more likely to use e-mail for managing volunteers.	The more administrators use e-mail to manage volunteers, the more likely they will use online recruitment systems to recruit them into the volunteer program.		
<b>Socio-Individual Predictors</b>	The younger the administrator, the higher the level of e-connectivity.		The more time administrators spend using ICT, the more they will use e-mail to manage volunteers.	The more positive administrators are about the usefulness of ICT, the more likely they will be adopters of new ICT applications like the VOE.  Administrators who are also volunteers are more likely to use online recruitment tools to search for volunteers.  The greater the involvement of the administrator in "network" type training (e.g., training provided by volunteer centers and professional associations), the greater the perceived impact of the VOE on the volunteer program.	The greater the perceived usefulness of the VOE, the greater the perceived impact on the volunteer program.  The more time spent using ICT in the job, the more positive the perception that ICT is having a positive impact on the volunteer program.	The more positive the perception that ICT is useful, the more positive the perceived impact on the volunteer program.

factors were responsible for different patterns of ICT use. This reflects the realization that ICT use is not a singular construct.

However, even though the various forms of ICT use were associated with differing organizational, technological and socio-individual factors, there is nevertheless a pattern among the predictors. Specifically, applications that were "newer" to volunteer administration, like the use of online systems to recruit and the use of e-mail to manage volunteers, are more likely to be influenced by the individual characteristics of volunteer managers such as their attitudes and past experience with use of these applications. This finding is consistent

with the earlier research on determinants of when technology is adopted. It, too, suggests that attitudes play a central role (Davis, 1989; DeLone & McLean, 1992; 2002; DeSanctis, 1983; Franz & Robey, 1986; Seddon, 1995; Seddon, Graeser & Willcocks, 2002; Seddon & Kiew, 1994). For those with access to ICT, the variation in usage of new applications in volunteer administration is not so much because of the technology as it is because of the attitudes users have toward it. Those who see the value of ICT applications in the new administrative context tend to gain more experience with them than those who do not, so are more prone to adopt them.

## 5. SO WHAT? HOW CAN VOLUNTEER ADMINISTRATORS CREATE A SUPPORTIVE CLIMATE FOR ICT?

While new ICT applications have provided volunteer programs with new tools to conduct work and to manage relationships, not all administrators are making use of them to the same degree. The purpose of this paper has been to provide answers to basic questions about ICT and ICT applications including the extent to which they are used, and the factors that challenge their use in volunteer programs. In sum, our findings suggest that there may be an ICT "usage divide" in the sample of Canada's volunteer programs we studied. This problem stems not from administrators being "inadequate" users of ICT but more from the presence of certain factors at organizational, technical and social-individual levels that create barriers to successful implementation.

The research also highlights the importance of the underlying attitudes of those responsible for making key decisions about the adoption of ICT or implementing new applications once they are acquired. All those involved must perceive there are advantages to them in their work and must see them as exceeding the costs of implementation in terms of available time and money. Simply buying ICT components and expecting individuals to use them is unlikely to succeed. Success, then, is measured in terms of "the users' perception of utility and satisfaction with ICT and how well it supports them in pursuit of the benefits they perceive will result from use" (Garrity & Sanders, 1998, pg. 2). In this "socio-technical" view of ICT use, which has gained more attention over the years as more failures were attributed to individuals' reactions to new ICT systems (Tait and Vessey, 1988, pg. 91), attitudes are shaped from successful interactions users have with ICT (DeSanctis and Poole 1994, pg. 125). Successful interactions, then, breed attitudes that create a more positive climate to support ICT use. Conversely, negative attitudes will have the opposite effect.

Lack of attention to "climate" issues is of particular concern for volunteer programs because ICT is being introduced into a sector

that has traditionally been very non-technological. The sector is full of hands-on administrators who were recruited to work in the volunteer program because of their experience in working with volunteers and commitment to the cause or the mission of the organization. As a result, the experience and knowledge they bring to the job may not be of the kind that will assist them in using new ICT. The same can be said for the heads of volunteer organizations. The managers that face the most challenges, then, are those with the least experience using ICT.

The key factors that lead to successful use of ICT, then, are those that pay attention to how managers gain experience with ICT (Taylor and Todd, 1995). While there is no ICT success management model available for use in volunteer programs, our research and the existing general ICT literature suggests that the best approach should incorporate the following elements:

- If possible, "try before you buy" by acquiring ICT applications on a trial basis so administrators can gain experience with new ICT as well as having a chance to identify any potential weakness in their suitability. If you can't try first, "start small" by introducing new technology in manageable pieces that don't overwhelm its potential users. This type of introduction to ICT allows for an ongoing or "evolving" approach to technological change and organizational development.
- Take an "involving" approach to ICT by involving administrators in the development of new ICT applications. We found online recruitment systems that were perceived to be the most successful were those with high degrees of administrator involvement in the development, training and evaluation of these applications.
- Develop "modular training" which breaks learning into manageable bits that provides knowledge of new tools, how to use them, and how they will benefit volunteer administration work.
- Try to build adequate training into the contracts negotiated with ICT vendors. We found a positive relationship between vendor-supplied training and use of ICT

applications in the programs we studied.

- Be sure there is plentiful access to technical support on an ongoing or as needed basis. This support should be of the kind that assists administrators in working through technical issues so that they gain more experience in resolving them. Support can be obtained from many sources including vendors, volunteer centers, specialty organizations, or informally from colleagues in the work environment who have experience with ICT.
- Actively engage volunteer administrators in ICT issues within the volunteer community. Engagement of this kind has been found to positively impact ICT change in private sector companies. This type of engagement has been referred to in the literature as *Communities of Practice* (CP). CP is a knowledge management framework used by IBM (Birman & Ritsko, 2001) and other private sector companies (e.g., Braganza & Lambert, 2000; Coe, 1998) as a way to improve organizational performance during times of technological change (Birman & Ritsko, 2001). With the CP model, there are multiple levels linking "persons and organizational behaviour, supporting processes, and enabling technological factors" (Birman & Ritsko, pg. 812). The logic behind this approach is to "develop social capital ... based on existence of communication channels between practitioners, on relationships that build trust and a sense of mutual obligation, and on a common language and context for the community" (Birman & Ritsko, pg. 812). This type of framework is supported by our research, which revealed that social influences between administrators and stakeholders were positively associated with the use of ICT. A CP framework linking administrators and other stakeholder groups with evolving technologies would be helpful in reducing the kinds of barriers that are negatively impacting the capacity of volunteer administrators to use ICT effectively.
- Dedicate resources (money and time) to support all aspects of ICT use as described above including resources to purchase ICT

components, develop them over time, provide training and ongoing support of individuals in using them, as well as resources to create volunteer administrator *Communities of Practice*.

## REFERENCES

- Birman, A., & Ritsko, J. (2001). Preface. *IBM Systems Journal*, 40(4), pp. 812-813.
- Blau, A. (2001, May). *More than bit players: How information technology will change the ways nonprofits and foundations work and thrive in the information age*, Report to the Surdna Foundation. pp. 1-44. New York, NY, <http://www.surdna.org/documents/morefinal.pdf>
- Braganza, A., & Lambert, R. (2000). Strategic integration: Developing a process governance framework. *Knowledge and Process Management*, 7 (3), 177-186.
- Brock, K. L. (2002, August). *Antagonists and allies: Voluntary organizations, business and the policy process*, Paper presented at the Institute of Public Administration of Canada Meetings, pp. 1-15, Halifax, Nova Scotia.
- Cargo, R. A. (2000). Made for each other: Nonprofit management education, online technology, and libraries. *Journal of Academic Librarianship*, 26 (1), 15-21.
- Checkland, P., & Holwell, S. (1998). *Information, systems and information systems*, Chichester: John Wiley & Sons.
- Clarke, S. (2001). *Information systems strategic management*. London: Routledge.
- Coe, L. (1998). Five small secrets to systems success. In E.J. Garrity and G.L. Sanders (Eds.). *Information systems success measurement*. Hershey: Idea Group Publishing.
- Comor, E. (2001). The role of communications in global civil society, forces, processes and prospects. *International Studies Quarterly*, 45, 389-408.
- Cravens, J. (2000). Virtual volunteering: Online volunteers providing assistance to human service agencies. *Journal of Technology in Human Services*, 17 (2/3), 119-136.
- Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.



- DeLone W., & McLean, E. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(3), (pp. 319-340).
- DeLone, W., & McLean, E. (2002). Information systems success revisited. *Proceedings of the 35th Hawaii International Conference on System Sciences*, pp. 1-11.
- DeSanctis, G. (1982). 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.
- 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. (1999, January). Building the technological capacity of the voluntary sector, *The Voluntary Sector Network Support Program (VolNet) National Advisory Committee Report*, 1-21. Ottawa, Ontario: Author.
- Government of Canada. 2002: *VolNet Final Report*, Retrieved June 16, 2003, from [http://www.volnet.ca/e/final\\_report\\_e.asp](http://www.volnet.ca/e/final_report_e.asp)
- Hall Aitken (2001, November). *E-enabling the voluntary and community sectors, final report*. Glasgow: UK Government Online, Office of the E-envoy (Publisher).
- Ipsos Reid. (2001, March) *Volunteer Opportunities Exchange (VOE), Summary of Findings*, 1-15.
- Johnson, M. (1999). *Nonprofit organisations and the Internet*. (pp. 1-18). Retrieved July 23, 2001 from [www.firstmonday.org/issues/issue4\\_2/mjohnson/index.html](http://www.firstmonday.org/issues/issue4_2/mjohnson/index.html)
- Kerr, G. (2002, January). Final report: Technology needs of the Canadian voluntary sector, *IM/IT Joint Table of the Voluntary Sector Initiative*, pp.1-38.
- McInerney, P. B. (2004, June). *Working for equality and economic liberation: Databases and low-income families during TANF debate*. Retrieved July 1, 2004 from [www.techsoup.org/howto/npstory\\_article.cfm?ArticleID=76&topicid=0](http://www.techsoup.org/howto/npstory_article.cfm?ArticleID=76&topicid=0)
- Murray, V., & Harrison, Y. (2002a). *The impact of information and communications technology (ICT) on volunteer management*. Toronto: Canadian Centre for Philanthropy.
- Murray, V., & Harrison, Y. (2002b). *Virtual volunteering: Current status and future prospects*. 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*. [Brochure]. Washington, D.C.: Author.
- Parmegiani, 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). *The IT revolution and nonprofit organizations in Los Angeles*. Paper presentation to the ARNOVA Conference, Montreal, QC.
- Richter, M. N., Jr. (1982). *Technology and social complexity*. Albany: State University of New York Press.
- Salamon, L., Anheier, H., List, R., Toepler, S., & Sokolowski, S. and Associates. (1999). *Global civil society: Dimensions of the nonprofit sector*. Baltimore: The Johns Hopkins Center for Civil Society Studies.
- Schneider, J. (2003). Small, minority-based nonprofits in the information age. *Non-Profit Management and Leadership*, 13(4), 383-399.
- 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. 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. B., Graeser, V., & Willcocks, L. (2002). Measuring organizational IS effectiveness. *ACM SIGMIS Database*, 33(2), 11-28.
- Seddon, P. B., & Staples, D. S., Patnayakuni, R., & Bowtell, M. (1999). Dimensions of IS success. *Communications of the AIS*,

- 20(s), 165-176.
- Seedco. (2002). *The evolving role of information technology in community development organizations*. New York: Author.
- Tait, P., & Vessey, I. (1988, March). The effect of user involvement on system success: A contingency approach. *MIS Quarterly*, 12(1), 91-108.
- Taylor, S., & Todd, P. (1995, December). Assessing IT usage: The role of prior experience. *MIS Quarterly*, 561-569.
- Ticher, P., Maison, A., & Jones, M. (2002). *Leading the way to... ICT success*. London: The Baring Foundation.
- Virtual Volunteering Project. (2001). *The virtual volunteering project*. Retrieved July 28, 2001, from [www.serviceleader.org/vv/](http://www.serviceleader.org/vv/)
- Warren, M. A. & Weschler, L. F. (1999). Electronic governance on the Internet. In G. David Garson, *Information technology and computer applications in public administration: Issues and trends*, Hershey, PA: Idea Group Publishing, 118-136.
- Warwick, M., Hart, T., & Allen, N. (2002). *Fundraising on the Internet: The e-Philanthropy Foundation.org's guide to success Online*. San Francisco: Jossey-Bass.

## ENDNOTES

<sup>1</sup>See <http://www.techsoup.org>; <http://www.charityvillage.com> for these Web sites.

<sup>2</sup>Though the surveys were related in that they all dealt with ICT use, the questions were not all the same for each sample; hence, the results to follow draw on different combinations of survey data based on commonality of questions.

<sup>3</sup>We mailed 250 questionnaires to this group and 129 were returned for a response rate of 52%.

<sup>4</sup>The questionnaire was very similar to the one sent to the local group. In this group, 1,100 surveys were electronically delivered by e-mail and 365 were returned for a response rate of 33%.

<sup>5</sup>Response rates were difficult to determine because of a high rate of delivery failure. Some estimates are possible by calculating the percentage of responses of the total number of respondents reached. For the

VOE subsample 516 e-mails were delivered to the specified addresses. Of the 516 e-mails, 467 were acknowledged by the users as received while 49 were not. A response rate was calculated by averaging the number of receipted e-mails by the number of surveys completed. By this calculation the VOE subsample response rate was very high at 70%. Due to difficulty confirming how many volunteer centres distributed the 2003 survey to their members, we are unable to calculate a response rate for this subsample.

<sup>6</sup>The national samples are considered biased in favour of Internet users while the mail survey respondents are considered more representative of volunteer program administrators. Although these restrictions limit our ability to generalize from our findings, we would argue that the total sample represents considerable diversity of volunteer administrators in terms of location, personal background, organization size, mission, and size of volunteer programs.

<sup>7</sup>Virtual volunteering is the use of ICT to perform volunteer work in whole or in part at a distance from the organization.

<sup>8</sup>VICTA contains volunteer opportunities offered by the locally-based members of the volunteer centre that adopts it (in the case of this study, Volunteer Victoria). The VOE system contains volunteer opportunities from across Canada and is open to volunteers everywhere.

<sup>9</sup>We entered all of the factors that we found to be "associated" with ICT use and effectiveness to see whether they were also significant predictors. We accomplished this through statistical procedures that hold all of the factors or independent variables constant. These techniques, known as hierarchical and binary logistic regression, allowed us to comment on which of the independent variables predicted or did not predict the dependent variable.

<sup>10</sup>Dependent variables included the different uses of ICT (e.g., e-mail, Web sites and online recruitment system) and their perceived impact on the volunteer program. The ICT Impact variable is a scale that measures manager perceptions (0=not at all; 1=small extent; 2=moderate extent; 3=large

extent) of the extent to which the use of ICT in the volunteer program resulted in reduced cost, increased productivity, improved overall efficiency, improved service quality, and increased significance of the volunteer program. The VOE Impact variable is a scale that measures perceptions of the ability of

the online system to perform the task of recruitment of volunteers (1=extremely ineffective or inefficient or not at all; 5=extremely efficient or effective or very much) including, how efficient it is in saving time or other resources, how effective it is in bringing in volunteers and, the extent to which it meets information processing needs (i.e. matching

### APPENDIX A

Factors or Independent Variables (X)	Dependent Variables (Y)					
	E-mail Type 1 Use (Org)	E-mail Type 2 Use (Vol Man)	Web Level	VOE Use	VOE Impact	ICT Impact
<b>Factors and Influences</b>						
<b>ORGANIZATIONAL SYSTEMS LEVEL</b>						
"SOFT" FACTORS						
Leadership Support						
Co-Worker Support						
Job Satisfaction	.11*					.11*
Job Autonomy	.17**		.12*			.18**
Job Stress	.10*					.13**
Job Environment Stress (Reverse Code)	.14*					
"HARD" FACTORS						
Number of Volunteers						.22
Number of Volunteer Position Openings		.12**	.13*			.21**
Number of Enquiries to Openings		.10*	.15**			.20**
Volunteer Program Budget		.20**	.15**			
Percentage of VPB Allocated to ICT	.09*	.10*	.23**			.21**
Size of Org. Annual Budget		-.12**				.10*
Number of ICT Changes	.14**	.10*	.14**			.20**
ICT Support	.11**					.11**
<b>TECHNICAL SYSTEMS LEVEL</b>						
ICT System Quality	.17**		.13*			.13**
ICT System Capacity			.13*			
ICT Ease of Learning	.23**	.24**				.19**
Perceived Ease of Use of VOE System						
E-mail Type 1		.33**				.18**
E-mail Type 2	.33**			.14**	.21**	.31**
Web Site Use for Volunteer Program		.16**				.17**
Web Site Level						.13*
VOE Use						
Online Recruitment Method Usage (Not VOE Specific)		.11*	.12*		.74**	.10*
Network Type			.13**			

\*Correlation is significant beyond the 0.05 level (2-tailed)  
 \*\*Correlation is significant at the 0.01 level (2-tailed)  
 \*\*\*Correlation is borderline significant at the .05 level (2-tailed)

Factors or Independent Variables (X)	Dependent Variables (Y)					
	E-mail EM1 Use (Y1)	E-mail EM2 Use (Y2)	Web site Use (Y3)	VOE Use (Y4)	VOE Impact (Y5)	ICT Impact (Y6)
<b>Factors and Influences</b>						
<b>SOCIAL-INDIVIDUAL LEVEL</b>						
<b>"USER INVOLVEMENT"</b>						
Involvement in ICT Decisions and Feelings of Ownership Over Them	.23**	.26**				.18**
Participation in Organizational Decisions	.19**	.20**				
ICT Self-Training		.10*				
ICT informal Training	.15**					
LVC ICT Training					.21*	
NVC ICT Training	.09*	.11*			.28**	
Professional Association ICT Training						.10*
College ICT Training	.11*					
Organizational ICT Training	.19**					
Vendor ICT training	.17**	.11*	.11*			
Voluntary Sector Network Training (National, Local and Professional Combined)					.23**	
Involvement in ICT Development (VOE only)	.09*	.15**	.11*	.19**		
Involvement in ICT Training (VOE only)	.09*	.09*	.17**	.17**	.26**	
Involvement in ICT Evaluation (VOE only)		.09*	.16**	.22**	.18*	
<b>"END USER CHARACTERISTICS"</b>						
Gender (Males =1; Females=0)		.11*	.13*			
Age (Reverse Code)		.10*	.13*			
Education				.09***		
Knowledge (VOE only)				-.59**		
Position Status (Paid or Unpaid) (Reverse Code)		.18**				
Time Using ICT at Work	.20**	.29**			.19*	.31**
Time Work per Week	.13**		.12*			.19**
Time Using ICT at Home	.12**	.14**				.16**
Technical Ability	.21**	.21**				.24**
<b>"EXPECTATIONS OF BENEFITS"</b>						
Perceived Usefulness of ICT	.25**	.11*			.08***	.38**
Perceived Usefulness of VOE					.79**	.18*