ORIGINAL ARTICLE

Institutional and Noninstitutional Influences on Information and Communication Technology Adoption and Use Among Nonprofit Organizations

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In this study, nonprofit organizations (NPOs) in New Zealand were surveyed to explore influences on adoption and use of information and communication technologies (ICTs). We sought to extend existing research by considering ''institutional'' influences alongside organizational and environmental features and by examining how institutional forces affect optimal use of ICTs. Findings suggest that NPOs adopting and using ICTs tended to be self-perceived leaders or those who scanned the environment and emulated leaders and tended to have organizational decisionmakers with the expertise to enable adoption and use. Furthermore, optimal fit of ICTs tended to be spurred by institutional forces if accompanied by self-perceived leadership and appropriate organizational resources. Implications for practice and theory are explored.

Information and communication technology (ICT)[1] use has proliferated throughout most sectors of the economies of developed countries. Like other general purpose technologies (Lipsey, Carlaw, & Bekar, 2005, p. 85), computer-based tools have become more widespread as additional applications and critical masses of users have developed. Although this is true to some degree in all sectors, nonprofit organizations (NPOs)[2] have generally lagged behind for-profit organizations (FPOs) in ICT investment (Schneider, 2003). However, NPOs have been urged to adopt ICTs in recent years and have done so increasingly (Hackler & Saxton, 2007).

The NPO sector is an important part of the economy and ''civil society,'' contributing to societal well-being through support for such diverse interests as sports, arts, and the environment, alongside the provision of myriad social services. The number and importance of NPOs globally has grown substantially in recent decades (Lewis, 2005). Thus, understanding trends in the sector and how to improve

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NPO effectiveness is essential. ICTs are seen by NPOs as means of enhancing efficiency but, crucially, also as means for establishing legitimacy in the eyes of key stakeholders. This latter motive suggests the utility of institutional theory (e.g., Barley & Tolbert, 1997; Scott, 1995) in explaining ICT adoption and use.

Importantly, there is some evidence that NPOs may be more subject to institutional pressures than FPOs (Frumkin & Galaskiewicz, 2004). However, while highlighting important influences on organizational practice, institutional theory tells only part of the story. Material realities—features of the organization and its relevant environment—also influence decisions, yet most extant literature presents either–or approaches to organizational change; that is, institutional pressures are typically presented as an alternative rather than a complementary explanation for organizations' ICT adoption and use behaviors. Furthermore, there remain important unanswered questions about institutional theory, such as the consequences for organizations of responding to institutional pressures.

The goal of this article is to address such questions. Through a large-scale survey of the adoption and use of Websites and other ICTs in New Zealand NPOs, we sought to provide a more comprehensive exploration of ICT adoption and use by NPOs compared to previous studies, assessing institutional pressures alongside other likely influences by (a) addressing the dearth of research on ICT adoption in the NPO sector (Finn, Maher, & Forster, 2006), (b) extending our understanding of institutional theory by considering institutional pressures alongside noninstitutional forces, and (c) examining effects of institutional pressures on the "fit" of such technologies with organizational practices.

Literature review

We first examine the literature on the nonprofit sector, especially trends in New Zealand NPOs, and next consider the literature on ICT adoption and use in the nonprofit sector, focusing specifically on the question of what influences NPOs to adopt ICTs. Then, we focus on institutional theory as a potential explanation of ICT adoption and use.

The nonprofit sector in New Zealand

The nonprofit sector is generally considered to include those organizations that are (a) private, (b) nonprofit distributing, (c) of public benefit, (d) self-governing, and (e) composed of volunteers, at least to some extent (Lewis, 2005). In New Zealand, as in many other countries, the sector constitutes an important part of the economy, including over 97,000 NPOs that make up nearly 5% of the economy, comparable to the entire construction industry (Ashley-Jones, 2007; Sanders, O'Brien, Tennant, Sokolowski, & Salamon, 2008). The sector includes a wide range of organization types, from those providing health, education, and social services to those promoting culture and civic action (Sanders et al., 2008). Although similar in many ways to the nonprofit sectors in other developed countries, there are several distinguishing features of the sector in New Zealand. Proportionally, New Zealand has the seventh

highest nonprofit workforce in the world, with 9.6% of the working population, as well as an unusually high volunteer workforce. Volunteers make up 67% of the New Zealand nonprofit workforce, compared with 48% for the average of English-speaking countries. This high figure is largely due to the fact that the majority of New Zealand organizations are small, with 90% employing no paid staff (Sanders et al., 2008).

After 1984, when the New Zealand government responded to a fiscal crisis by embarking on a major wave of reforms, the state began reducing social services and the nonprofit sector expanded to fill the gap (Tennant, O'Brien, & Sanders, 2008). The government essentially outsourced many services, shifting to a process of purchasing services through contracts from NPOs. This shift also increased government regulation and controls, with heightened accountability requirements, a need for greater professional staff and professionalism, and increased competition among NPOs for government contracts (Tennant et al., 2008).

While the New Zealand nonprofit sector has its own unique set of circumstances, researchers have observed similar trends internationally: growth in the sector to provide services no longer provided by the government, heightened scrutiny and concomitant accountability demands, increased competition for contracts and resources, and increased emphasis on professionalism. Such trends have been documented in the United States (Chetkovich & Frumkin, 2003; Hackler & Saxton, 2007), the United Kingdom (Burt & Taylor, 2003), Australia (Randle & Dolnicar, 2009), India (Ganesh, 2003; Ramanath, 2009), and elsewhere worldwide (Ebrahim, 2003).

NPOs are theorized as differing in important ways compared with FPOs. Particularly relevant to our investigation is output ambiguity (Frumkin & Galaskiewicz, 2004), meaning that outputs are less easily measured and less carefully monitored in NPOs compared with FPOs. As Noir and Walsham (2007) note, agreeing on key performance indicators is notoriously difficult in NPOs, given that they typically do not have measures such as stock prices and profit-and-loss statements as tangible indicators of success or failure. Although there is certainly variation within the sector on this dimension, output ambiguity is a commonly observed feature of NPOs (Kanter & Summers, 1987; Lewis, 2005).

Thus, similar to NPOs worldwide, New Zealand NPOs are facing increased pressure to be accountable, competitive, and professional, and have greater output ambiguity compared with FPOs. The New Zealand nonprofit sector also has some differences compared to comparable sectors in other developed countries, tending to consist of smaller organizations on average, a higher percentage of expressive (i.e., those enabling the expression of cultural, religious, and policy values and interests) versus service organizations, and having a greater reliance on volunteers. These factors are important to consider in identifying influences on ICT use in the sector.

Influences on ICT use in the nonprofit sector
The literature on ICT use in the NPO sector explicitly or implicitly suggests three sets of influences on ICT adoption and use: Organizational characteristics, environmental

characteristics, and pressures to establish legitimacy. A number of organizational characteristics have been considered to influence ICT adoption among NPOs. Research has focused mostly on tangible resources that enable or support adoption, especially organizational size, budget, and ICT support.

For example, in one of the few survey studies of ICT adoption in the NPO sector, Finn and colleagues (2006) found that budget and organization size were positively correlated with ICT-related training and procedures designed to enhance ICT adoption (e.g., technology plans) but negatively correlated with proportion of staff who used the Internet. Similarly, a survey of both for-profit and nonprofit hospitals found that organizational size and system membership (i.e., being affiliated with a network of other hospitals) were significant predictors of ICT adoption (Hikmet, Bhattacherjee, Menachemi, Kayhan, & Brooks, 2008). In another study, Corder's (2001) survey showed that NPOs that have (a) discretion to choose technologies, (b) a small volunteer workforce, (c) leaders who support innovation, and (d) high donor commitment to new technologies were most likely to adopt new technologies. High donor commitment was the strongest correlate and, importantly, budget size and proportion of funding from government sources were not significantly related to ICT adoption. A fourth survey-based study (Hackler & Saxton, 2007) focused on evaluating sophistication of ICT uptake and not specifically on influences on adoption, although the authors found differences in sophistication that suggested the importance of the size of the organization's budget as a key influence. Finally, Schneider's (2003) ethnographic study of small, minority-focused NPOs found that lack of resources, including staff and volunteers drawn from populations least likely to be ICT literate, inhibited uptake.

Underlying the research on organizational characteristics is a view of ICTs as efficiency-enhancing tools. That is, scholars have attempted to explain ICT adoption among NPOs by constructing ICTs as material artifacts that constitute rational means to enhance efficiency and modernize and that, therefore, NPOs with sufficient resources would naturally seek to acquire. One study of ICT use by NPOs in the United Kingdom articulated this argument as:

> An organisation that has efficient systems will be able to respond more quickly and efficiently to its clients and its funders. Better statistics, less duplication of effort, a faster, more appropriate response: the right technology can deliver all of these, cost-effectively and often quite simply. (Ticher, Maison, and Jones, 2002, p. 1)

We take efficient systems to mean those that produce the greatest quantity and/or quality of goods or services while minimizing use of resources. Although some have argued that NPOs have been traditionally less concerned about efficiency than have FPOs (Frumkin & Andre-Clark, 2000; Lewis, 2005), many recommend ICTs as means to help NPOs "stretch their dollar" and achieve more. For example, NPOs have been advised to use the Internet to target funding and to create Websites to advertise and market programs, increase the effectiveness of procurement, and

enhance communication with stakeholders (Elliott, Katsioloudes, & Weldon, 1998). The view of ICTs as efficiency-enhancing tools seems to underlie the bulk of research on ICT adoption by NPOs. It assumes a technical rationality, "the idea that technology is synonymous with process rationalization and progressive modernity in every application and context" (Noir & Walsham, 2007, p. 314).

The second category of influences on ICT adoption by NPOs—characteristics of the environment—is closely connected to the first. The drive for efficiency is increased by an environment characterized by heightened scrutiny and, especially, competition for resources. Lee, Chen, and Zhang (2001) epitomize this view, providing an analysis of the means by which the Internet can be used to enhance efficiencies in multiple organizational operations and thereby achieve "competitive advantage." Although there has been little systematic research on characteristics of the environment as an influence on ICT adoption, a view of the nonprofit sector as increasingly competitive underlies much of the research on NPOs' adoption of ICTs. Burt and Taylor (2003), in researching ICT adoption in the nonprofit sector in the United Kingdom, typify this assumption in explaining the rationale for their research: "Heightened competition for both funding and volunteers, accompanied by acute pressures to deliver performance improvements, bring strong imperatives for organizational transformation" (p. 115). Other researchers have followed suit, arguing that an increasingly competitive environment has led to pressure to adopt ICTs (Corder, 2001; Hackler & Saxton, 2007; Schneider, 2003; Ticher et al., 2002).

The third influence is somewhat less prominent in the literature: A view of ICTs as a symbolic resource to establish legitimacy. This perspective highlights the changes in the nonprofit sector reviewed in preceding paragraphs, especially the trend toward heightened scrutiny by, and accountability to, stakeholders—particularly funding bodies—who have expectations that organizations worthy of support will have certain characteristics, including the use of advanced technologies. Thus, NPOs must be concerned about their organizational reputations in the eyes of stakeholders and adopt and use ICTs in part to appear legitimate. As Noir and Walsham (2007) explained: "Initiatives gain legitimacy and increase the likelihood of future resource allocations by making ICT a prerequisite" (p. 314). Schneider (2003) found that nonprofits that could not effectively use ICTs often lost out on funding because they had trouble meeting funders' expectations for proposal quality and record-keeping systems. Another study found evidence that a state agency in the United States identified as benchmarks those NPOs that were early adopters of particular ICTs and then used these NPOs and their practices as models in developing recommendations and requirements for other NPOs (Thatcher, Brower, & Mason, 2006). Thus, adopting ICTs serves as a way to signal the organization's status as one that embraces "best practice" and is therefore worthy of support.

In summary, NPOs may be influenced to adopt ICTs for multiple reasons. Some of these reasons reflect a "technical rationality" (Noir & Walsham, 2007); specifically, ICTs are seen as material instruments that can increase efficiency and effectiveness, and consequently organizations with the resources and support to acquire them will

do so. However, the literature also points to ICTs as symbolic resources and suggests that organizational leaders who wish to position their organizations as legitimate can do so by adopting and using ICTs. This latter motivation suggests the relevance of institutional theory as a way of understanding ICT adoption and use by NPOs.

Theoretical framework, hypotheses, and research questions

Institutional theory (DiMaggio & Powell, 1983; Scott, 1995; Scott & Christensen, 1995; Scott & Meyer, 1994) recognizes cultural and institutional forces that mediate the spread of management practice and also recognizes that organizations often enact changes that reflect ''myths in the institutional environment rather than a detached calculus of costs and benefits'' (Frumkin & Galaskiewicz, 2004, p. 284). The theory highlights the tension between perceived institutional norms and efficiency considerations (Noir & Walsham, 2007) and recognizes the symbolic import of certain organizational practices to signal conformity to emergent norms.

Institutional theory proposes that under certain circumstances organizations will come to resemble one another in their structures and practices due to a host of pressures acting on them collectively. Because organizations are heavily influenced by one another's actions, and pattern their own behaviors after those of other organizations at large, they are continually in flux, as they are produced and reproduced in response to a larger social—that is, institutional—environment. Institutional pressures from the environment thus magnify the homogeneity of practices across institutions. Research emanating from institutional theory has empirically documented how common practices become established across multiple organizations, in order that organizations may be seen as legitimate members of a particular organizational field (Scott & Meyer, 1991; Tolbert & Zucker, 1983).

DiMaggio and Powell (1983; Powell & Dimaggio, 1991) describe this trend of homogeneity as *isomorphism* or a perceived need to attain political or social power driven by institutional and social legitimacy. Pressures toward isomorphism are particularly pronounced under conditions of high ambiguity (Abrahamson & Rosenkopf, 1993; DiMaggio & Powell, 1983; O'Neill, Pouder, & Buchholtz, 1998), such as when new technologies are introduced and little reliable information about them is available. Ambiguity results from lack of foresight as to how new technologies might affect organizational processes and structures (Huber, 1990). Additionally, because of the output ambiguity typical of many NPOs, Frumkin and Galaskiewicz (2004) found that NPOs are more swayed by institutional pressures compared with FPOs.

The homogeneity of organizational forms in the environment increases with institutional forces that come in one of three forms (DiMaggio & Powell, 1983; Scott, 1995). *Coercive pressure* results from external demands such as formal legal directives or from informal pressures acting on dependent organizations that encourage them to assume a particular structure or meet particular cultural expectations. Thus, the degree to which an organization sees itself as *accountable* to government regulators or funders, for example, should correspond with pressure to conform to the expectations of these authorities.

Normative pressure results primarily from professional standardization. Employees may be formally socialized into normative practices through education or training in their profession or by learning organizational protocols, or they may learn these practices more informally through professional associations, conferences, and publications. Thus, the degree to which an organization insists on *professionalism* should correspond to normative pressure.

In addition to coercive and normative forces, institutional theory suggests a more local response to minimize uncertainty. *Mimetic pressure* results from direct peer imitation that alleviates organizational uncertainty (Haunschild & Miner, 1997). An example is what has been labeled *institutional pressure* (Flanagin, 2000; the degree to which organizations adopt *expected practices*—i.e., practices expected of other organizations perceived as similar to them), which has been shown to influence FPOs' adoption of Websites. Mimetic pressure is enhanced by *competitor scanning* (Grover & Goslar, 1993), a common practice across organizations that is a precursor to emulation of competitive peers, ultimately leading to greater homogeneity across the respective institutional field. *Marketization*, or the degree to which NPOs imitate the practices of business organizations, is another form of mimetic pressure (Doolin & Lawrence, 1998; Fairclough, 1993). Finally, organizations that perceive themselves to be *leaders in their field* might be especially prone to mimetic pressures (Flanagin, 2000). Perceived leadership can pressure organizations to remain current, adopting the latest innovations and ideas to "stay ahead of the pack" and maintain their leadership status. Leadership pressures can persuade organizations that they must lead rather than follow, encouraging early versus later adoption of innovations. Flanagin found evidence that organizations' self-perception of leadership in their field positively correlated with Website adoption, indicating a tendency to lead rather than follow.

Institutional theorists emphasize that these pressures may be isolated for analytical purposes, but that in practice, they often operate simultaneously and are difficult to differentiate. Thus, we offer the following hypothesis:

> H1: Pressures derived from institutional isomorphism (i.e., *perceived leadership in the field, professionalism*, *expected practice*, *competitor scanning*, *accountability*, and *marketization*) will influence (a) NPOs' decisions to adopt a Website and (b) their usage of ICTs more generally.

Although the work to date on institutional theory is insightful, there remain a number of unanswered questions. For example, research tends to consider institutional isomorphic pressures as an alternative explanation of organizational practices rather than a complementary explanation in which institutional isomorphic pressures are considered alongside other more "tangible" influences. Our review in the preceding paragraphs of the influences on NPOs' adoption of ICTs suggests that organizational characteristics, such as organizational size, budget, and support, as well as environmental characteristics, such as intensity of competition in the environment, may influence adoption alongside institutional isomorphic pressures. Thus, we posit the following two hypotheses:

H2: Organizational characteristics (i.e., *organizational budget*, *information technology (IT) knowledge*, *IT support*, and *organizational size*) will influence (a) NPOs' decisions to adopt a Website and (b) their usage of ICTs more generally.

H3: Environmental factors (i.e., *competition intensity*) will influence (a) NPOs' decisions to adopt a Website and (b) their usage of ICTs more generally.

Considering institutional isomorphic pressures alongside organizational and environmental factors provides a unique opportunity to consider the relative influence of institutional and noninstitutional forces and thus extends institutional theory. We therefore posit the following research question:

RQ1: What is the relative importance of environmental factors, organizational characteristics, and institutional isomorphic pressures on NPOs' technology adoption decisions and usage behaviors?

Another question raised by our review is whether institutional isomorphic pressures may lead organizations to adopt innovations inefficiently or nonoptimally. Technologies may be seen as having an *optimal fit* when their perceived usefulness matches their actual use; that is, optimal fit means that the organization adopts technology only when it is considered to be operationally useful—that is, useful for doing work, or accomplishing tasks, efficiently. Institutional theory recognizes that organizations sometimes adopt ICTs for symbolic reasons—to signal their conformity with institutional norms—as opposed to doing so as a means of enhancing efficiencies (Noir & Walsham, 2007). Thus, the pursuit of legitimacy is potentially seen as being in tension with the pursuit of operational efficiency.

This tension emerged initially in Meyer and Rowan's (1991) seminal work in which they directly contrasted efficiency considerations with institutional isomorphic pressures and has been echoed in other institutional theory research as well (e.g., Noir & Walsham, 2007; Powell & Dimaggio, 1991; Thatcher et al., 2006). For example, Noir and Walsham "emphasised the potential of ICT to play a mythical and ceremonial role in contrast to the traditional technical role that most see ICT . . . fulfilling" (p. 329). Another recent study suggested that organizations influenced by coercive and normative pressures may be more likely to find the technologies a poor fit for their situation and therefore less likely to make optimal use of them (Thatcher et al., 2006). In such a case, a technology is adopted but not perceived as useful, therefore resulting in wasted effort (and resources) for the organization. Thus, we posit the following research question:

RQ2: What are the effects of institutional isomorphic pressures, organizational characteristics, and environmental characteristics on optimal technology fit?

Method

A large-scale survey of NPOs in New Zealand was conducted, focusing on the influences on their adoption and usage of (a) Websites and (b) "Information and

Communication Technologies (ICTs) beyond just Websites,'' which were defined for respondents as ''computer-based technologies used to create, access, store, and distribute information or to communicate between individuals.'' Examples of ICTs mentioned included electronic mail, videoconferencing, electronic databases, intranets, and extranets.

Sample and procedure

Names and addresses of the organizations surveyed in this study were obtained from the New Zealand Ministry of Economic Development's Societies and Trusts Online Website (www.societies.govt.nz), which includes all registered charitable trusts and incorporated societies in New Zealand. Organizations were chosen for inclusion by first selecting an array of locations (i.e., by town or city) that represented a mix of North Island and South Island as well as urban and rural locations. Then, for each town or city selected, all organizations listed as having an address there were downloaded and included in the final list of 2,775 NPOs in New Zealand.

Survey items assessing theoretical and practical variables of interest were generated in consultation with a panel of advisors that included members of various government ministries and representatives of the NPO sector. A draft version of the questionnaire was developed and submitted to the panel of advisors for feedback, subsequently refined, and then mailed to the final list of organizations in November 2005. A second round of surveys was sent to nonrespondents in February 2006. Survey instructions noted that ''the most appropriate person to complete the survey is the person who is most knowledgeable about your organization's ICT capabilities and practices.'' While it may be seen as a limitation that these instructions meant that the respondent could hold one of several roles, we expected, given the small size of the vast majority of organizations in our sample, that respondents were likely to be familiar with ICT use as well as the various social pressures faced by the organization. Incentives in the form of a raffle prize were used to increase the survey response rate.

Of the surveys mailed out, 224 were returned due to invalid addresses and another 8 were returned because the organizations no longer existed, resulting in 2,543 valid questionnaires. Of these, 1,046 ($N = 1,046$) organizations returned completed surveys, for a response rate of 41%. Some questions were skipped, resulting in less than the total number of returned questionnaires being available for some analyses.

Measures

Dependent variables

Website adoption was measured dichotomously by the question: ''Does your organization currently have a Website?''

ICT use was assessed by responses to a series of questions about current uses of ICTs, using a 5-point scale ranging from strongly disagree to strongly agree. In order to decrease nonresponses, and because it is conceptually distinct, participants were also given the option to note if the use of some ICTs was ''not applicable'' to

them. Such responses were recoded prior to analysis as strongly disagree, because they are in effect equivalent (e.g., an organization indicating that the use of ICTs to recruit volunteers was not applicable to them would also strongly disagree with the statement that they use ICTs to recruit volunteers).

ICT use items represented a diversity of issues with potential overlap among them. Therefore, principal components factor analysis with varimax rotation was used to identify the major dimensions of ICT use. As shown in Table A1, a three-factor structure emerged from the data, explaining 58% of the variance overall. All factors had eigenvalues over 1.0 and individual items were retained only if they had a primary loading of at least .60 and a secondary loading below .40.

The first factor, labeled *communication and information flow*, was composed of five items (Cronbach's α = .86), which primarily focused on using ICTs for the exchange of messages and information within and outside the organization. The mean score on this scale was 3.58 (*SD* = 1.15). Five items loaded on the second factor, which appeared to represent the use of ICTs for *stakeholder engagement*, for which Cronbach's α was .81 (*M* = 2.25; *SD* = 1.02). Items in this factor included ways in which organizations might engage their various stakeholders, for example, by providing or acquiring training, recruiting staff and volunteers, conducting advocacy campaigns, or making technologies available to their clients. Three items loaded on the final factor, labeled *resource acquisition* (Cronbach's α = .86; *M* = 3.18; *SD* = 1.32). These items focused on using ICTs to research and apply for funding. Table A1 lists the survey items that compose these factors.

Following Zorn, Flanagin, and Bator (2010), optimal ICT fit (from RQ2) was operationalized in two ways: First, *optimal ICT use* was calculated as a difference score between current ICT use and the perceived usefulness of ICTs. Perceived usefulness was assessed through a series of questions that were parallel to the ICT use items; these questions asked respondents to assess how *useful* ICTs are "regardless of whether you currently have access to these tools or not" for each particular use. Then, the items parallel to those used to derive each factor of ICT use (i.e., communication and information flow, stakeholder engagement, and resource acquisition) were selected and a mean score derived for each factor. The usefulness scores were then subtracted from ICT use scores to derive scores of optimal ICT use. The logic of this measure is that using ICTs commensurate with their perceived usefulness is ideal. Scores ranged from +4 (5 − 1) to −4 (1 − 5), where the extremes indicate suboptimal use: Scores tending toward +4 indicate greater wasted effort (i.e., reported ICT use exceeds perceived ICT usefulness), whereas scores tending toward −4 indicate greater unrealized potential (i.e., perceived usefulness exceeds use).

Also following Zorn et al. (2010), a second measure of optimal ICT fit, *ICT use efficiency*, was derived as the absolute value of optimal ICT use. ICT use efficiency scores closer to 0 indicate more efficient ICT use (i.e., use of ICTs matches their perceived usefulness), whereas scores increasingly indicate suboptimal use the more they deviate from 0.

Independent variables

Four organizational characteristics were measured. *Organizational size* was assessed by the number of paid staff members. *Organizational budget* was measured by the annual budget at one of nine levels, which ranged incrementally from "less than $10,000" to "more than $50 million." *IT knowledge* and *IT support* were measured by items designed to assess the level of the organization's knowledge of ICT ("evaluate your organization's key decision makers' level of knowledge about computer technologies") and the level of technical support ("evaluate the adequacy of the technical support available to you"), respectively. Values ranged from 1 (very low) to 5 (very high).

One environmental characteristic was assessed. *Competition intensity* (Cronbach's α = .74), which was composed of items such as "there is tough competition in our sector for funding and support," was adapted from Grover (1993).

Six pressures derived from institutional isomorphism were assessed. Four of these assessed mimetic pressures. Measures of *leadership in the field* and *expected practice* were based on Flanagin (2000). Leadership was assessed by asking the extent to which organizations, relative to their direct peers, considered themselves to be a leader in their field (where 1 = we are not a leader in our field to 5 = we are the clear leader in our field). *Expected practice* (Cronbach's α = .78) was assessed by items addressing the degree to which organizations similar to their own relied on ICTs; these items assess beliefs about the degree to which ICT use is typical and expected among organizations in an institutional field.[3] Like all remaining variables, this was assessed on a 5-point scale, ranging from strongly disagree to strongly agree. *Competitor scanning* (Cronbach's α = .63; example item: "we monitor the moves of 'competitors' very closely") was adapted from Grover (1993). Additionally, several new scales were developed as part of this study. *Marketization* assessed the degree to which organizations sought to emulate and compete with private-sector organizations (Cronbach's α = .72). Reflecting coercive pressure, *accountability* was designed to assess the degree to which organizations felt accountable to a higher authority through such activities as reporting or compliance (Cronbach's α = .80). Finally, reflecting normative pressure, *professionalism* (Cronbach's α = .80) measured the extent to which organizations believed they needed to act like professionals, through projected expertise, training, and image. Table A2 contains specific items assessing each measure.

Results

Table 1 provides means, standard deviations, and zero-order correlations for all variables. The mean budget for organizations in the sample was 2.08 ($SD = 1.19$) on the 9-point scale, corresponding to a budget of between $100,000 and $499,000 annually. Mean number of paid employees was nearly 9 ($SD = 137.32$, $Mdn = 0.0$), with a range of 0–4,200, and the mean number of unpaid staff was 10.49 ($SD = 54.79$, $Mdn = 3.0$). However, omitting one outlier organization, the mean number of paid staff drops to 4.56 ($SD = 20.16$); similarly, by omitting one organization that listed an

Table 1 Zero-Order Correlations, Means, and Standard Deviations for All Variables

	Mean	SD	CIF Use	SE Use	RA Use	CIF Fit	CIF Eff	SE Fit	SE Eff	RA Fit	RA Eff	Exp Prac	Comp Scan	Marketiz	Ldr in Field	Account	Profession	Budget	Org Size	IT Knowldg	IT Support	Comp Inten
CIF use	3.58	1.15	1.00	.48**	.57**	.68**	−.63**	.30**	−.30**	.48**	−.48**	.42**	.29**	.22**	.26**	.25**	.29**	.23**	.04	.25**	.23**	.21**
SE use	2.25	1.02	.48**	1.00	.55**	.37**	−.37**	.60**	−.57**	.43**	−.44**	.34**	.35**	.15**	.21**	.27**	.28**	.22**	.05	.18**	.15**	.27**
RA use	3.18	1.32	.57**	.55**	1.00	.37**	−.38**	.27**	−.28**	.70**	−.68**	.36**	.30**	.25**	.19**	.38**	.32**	.26**	.03	.17**	.18**	.29**
CIF fit	−0.39	1.02	.68**	.37**	.37**	1.00	−.67**	.51**	−.50**	.58**	−.55**	.19**	.16**	.13**	.23**	.11**	.14**	.16**	.04	.16**	.16**	.10**
CIF eff	0.69	0.84	−.63**	−.37**	−.38**	−.67**	1.00	−.46**	.48**	−.52**	.57**	−.18**	−.11**	−.06	−.25**	−.06	−.12**	−.16**	−.02	−.17**	−.14**	−.06
SE fit	−1.01	1.02	.30**	.60**	.28**	.52**	−.46**	1.00	−.94**	.58**	−.54**	.07	.15**	−.03	.17**	.03	.06	.13**	.04	.15**	.12**	.05
SE eff	1.10	0.94	−.30**	−.57**	−.28**	−.50**	.48**	−.94**	1.00	−.57**	.56**	−.09**	−.14**	.02	−.18**	−.05	−.05	−.13**	−.05	−.14**	−.12**	−.06
RA fit	−0.70	1.09	.48**	.43**	.70**	.58**	−.52**	.58**	−.57**	1.00	−.88**	.19**	.19**	.13**	.17**	.17**	.19**	.18**	.04	.18**	.15**	.12**
RA eff	0.86	0.97	−.48**	−.44**	−.68**	−.55**	.57**	−.54**	.56**	−.88**	1.00	−.20**	−.16**	−.10**	−.18**	−.17**	−.16**	−.19**	−.05	−.16**	−.15**	−.09*
Exp prac	3.11	1.01	.41**	.34**	.36**	.19**	−.18**	.07	−.09**	.19**	−.20**	1.00	.38**	.32**	.27**	.42**	.39**	.40**	.08*	.27**	.35**	.37**
Comp scan	3.09	0.83	.29**	.35**	.30**	.16**	−.11**	.15**	−.14**	.19**	−.16**	.38**	1.00	.50**	.20**	.41**	.48**	.28**	.06	.21**	.18**	.62**
Mark	3.47	0.84	.22**	.15**	.25**	.13**	−.06	−.03	.02	.13**	−.10**	.32**	.50**	1.00	.21**	.49**	.60**	.31**	.00	.13**	.21**	.55**
Ldr field	3.33	1.27	.26**	.21**	.19**	.23**	−.25**	.17**	−.18**	.17**	−.18**	.27**	.20**	.21**	1.00	.21**	.32**	.31**	.03	.22**	.26**	.20**
Acct	3.55	1.03	.25**	.27**	.38**	.11**	−.06	.03	−.05	.17**	−.17**	.42**	.41**	.49**	.21**	1.00	.55**	.35**	.07	.07	.15**	.50**
Prof	3.85	0.73	.29**	.28**	.32**	.14**	−.12**	.06	−.05	.19**	−.16**	.39**	.48**	.60**	.32**	.55**	1.00	.37**	.04	.21**	.27**	.48**
Budg	2.08	1.19	.23**	.22**	.26**	.16**	−.16**	.13**	−.13**	.18**	−.19**	.40**	.28**	.31**	.31**	.35**	.37**	1.00	.25**	.18**	.32**	.29**
Org size	8.95	137.32	.04	.05	.03	.04	−.02	.04	−.05	.04	−.05	.08*	.06	.00	.03	.07	.04	.25**	1.00	.01	.04	.03
IT know	3.02	1.11	.25**	.18**	.17**	.16**	−.17**	.15**	−.14**	.18**	−.16**	.27**	.21**	.13**	.22**	.07	.21**	.18**	.01	1.00	.55**	.14**
IT supp	3.14	1.33	.23**	.15**	.18**	.16**	−.14**	.12**	−.12**	.15**	−.15**	.35**	.18**	.21**	.26**	.15**	.27**	.32**	.04	.55**	1.00	.13**
Comp inten	3.44	0.95	.21**	.27**	.29**	.10**	−.06	.05	−.06	.12**	−.09**	.37**	.62**	.55**	.20**	.50**	.48**	.29**	.03	.14**	.13**	1.00

$*p < .05.$ $**p < .01.$ $***p < .001.$

Note: CIF use = communication and information flow; SE = stakeholder engagement use; RA = resource acquisition; Exp prac = expected practice; Comp scan = competitor scanning; Mark = marketization; Ldr field = leader in the field; Acct = accountability; Prof = professionalization; Org size = Organization size; IT know = information technology knowledge; IT supp = IT support; Comp inten = competition intensity.

unusually large number of volunteer staff, the mean number of unpaid staff drops to 8.84 ($SD = 23.12$). Overall, 35% of the organizations ($N = 370$) had a Website at the time of the survey, whereas 63% did not ($N = 653$; 2% of responses were missing).

Stepwise binary logistic regression was used to identify significant predictors of Website adoption (H1a–H3a). All independent variables were entered into the analysis using a forward stepwise method in order to identify the model that best classified Website adopters and nonadopters. Of the 693 valid cases used in the analysis,[4] 287 (41%) had a Website and 406 (59%) did not. Thus, to be useful, the regression model needed to significantly exceed the 59% chance classification.

The best predictive model (model χ^2 (8) = 148.49, $p < .001$) was created with an eight-step solution in which the following variables were entered in sequence: expected practice, IT support, organizational budget, perceived leadership in the field, accountability, IT knowledge, professionalism, and competitor scanning. Among these, increases in variables were more likely to predict Website adoption, except in the cases of accountability and professionalism, which were negatively related to the likelihood of Website adoption. Confidence interval scores for exp b values that do not cross 1.0 show the stability of these directional relationships across the population. The Nagelkerke R^2 for this model was .26, indicating that it accounted for a moderate amount of variance in predicting whether organizations have a Website (Kinnear & Gray, 2006). The success rate of classification was 70%, a significant increase from the baseline model ($p < .001$), and inspection of the residuals indicated no points in the model responsible either for poor fit or undue influence. Table 2 provides specific results of the logistic regression analysis, which shows no support for H3a and strong, though not complete, support for H1a and H2a.

H1b–H3b were tested using stepwise regression, with each ICT use factor as a separate dependent variable (i.e., communication and information flow, stakeholder

Table 2 Logistic Regression Results for Website Adoption

		95% CI for exp b		
Included	B (SE)	Lower	exp b	Upper
Constant	−3.65*** (.55)			
Expected practice	0.54*** (.11)	1.37	1.72	2.15
IT support	0.19* (.09)	1.02	1.21	1.44
Organizational budget	0.34*** (.09)	1.19	1.41	1.67
Perceived leadership in field	0.28*** (.08)	1.13	1.32	1.55
Accountability	−0.24* (.11)	0.63	0.78	0.98
IT knowledge	0.21* (.10)	1.02	1.24	1.50
Professionalism	−0.47** (.11)	0.45	0.62	0.87
Competitor scanning	0.37** (.14)	1.11	1.45	1.89

Note: Nagelkerke R^2 = .26. Model χ^2(8) = 148.49, $p < .001$. CI = confidence interval; IT = information technology.
*$p < .05$. **$p < .01$. ***$p < .001$.

engagement, and resource acquisition). For all analyses, data were inspected and tested for violations of assumptions (e.g., collinearity, skewness, and linearity) through variance inflation factor (VIF) and tolerance statistics, residual plots, and other means, and no notable violations were found. As illustrated in Table 3, five variables explained organizations' use of ICTs for communication and information flow: expected practice, IT knowledge, perceived leadership in field, competitor scanning, and accountability. The same factors predicted use of ICTs both for stakeholder engagement, with the addition of marketization, and for the use of ICTs for resource acquisition, though without the inclusion of perceived leadership in the field. As shown in Table 3, however, the relative importance of the predictor variables differed by the type of ICT use, although expected practice consistently accounted for a large portion of the variance explained. It should also be noted that though significant, several of these variables explained only a very modest amount of variance (<2%) and should be interpreted accordingly. Overall, models accounted for between 20 and 24% of the variance and showed very strong support for H1b, limited support for H2b (accounted for solely by IT knowledge), and no support for H3b.

Table 3 Regression Analyses with ICT Use Variables as Outcomes

Variables	β	F Change	R^2	R^2 Change
Outcome = communication and information flow				
Expected practice	.285***	140.08***	.18	—
IT knowledge	.160***	26.91***	.21	.033
Perceived leadership in field	.118***	14.64***	.23	.017
Competitor scanning	.095*	9.76**	.24	.011
Accountability	.080*	4.02*	.24	.005
Outcome = stakeholder engagement				
Competitor scanning	.245***	88.63***	.12	—
Expected practice	.162***	33.10***	.16	.043
Perceived leadership in field	.100**	9.43**	.18	.012
Accountability	.173***	7.94**	.19	.010
Marketization	−.133**	8.24**	.20	.010
IT knowledge	.077*	4.31*	.20	.005
Outcome = resource acquisition				
Accountability	.284***	126.95***	.16	—
Expected practice	.175***	34.50***	.21	.042
IT knowledge	.105**	11.14***	.22	.013
Competitor scanning	.093*	5.43*	.23	.006

Note: Communication and information flow model: $F = 41.62$; $df = 5,649$; $p < .001$; stakeholder engagement model: $F = 26.94$; $df = 6,640$; $p < .001$; resource acquisition model: $F = 47.09$; $df = 4,650$; $p < .001$. ICT = information and communication technology; IT = information technology.
*$p < .05$. **$p < .01$. ***$p \leq .001$.

Tables 4 and 5 illustrate results for RQ2, assessing the optimal fit of ICTs (specifically, optimal ICT use and ICT use efficiency, respectively). Perceived leadership in the field, expected practice, and IT knowledge predicted *optimal use of ICTs* for communication and information flow; perceived leadership in the field, IT knowledge, organizational size, marketization (which was negatively related), and competitor scanning predicted optimal use of ICTs for stakeholder engagement; and organizational size, IT knowledge, accountability, and perceived leadership in the field predicted optimal use of ICTs for resource acquisition. Overall, models explained a modest amount of variance (9–10%), and several factors among those that were significant were not particularly influential in terms of their predictive power (i.e., only 1–2% variance was explained).

Several factors predicted the *efficiency of ICT use* among these organizations (Table 5), explaining 9–10% of the variance overall. Perceived leadership in the field, expected practice, and IT knowledge predicted efficient use of ICTs for communication and information flow; perceived leadership in the field, IT knowledge, organizational size, marketization, and competitor scanning predicted efficient use of ICTs for stakeholder engagement; and expected practice, perceived leadership in the field, organizational size, IT knowledge, and accountability predicted efficient use of ICTs for resource acquisition. Because lower scores indicate more efficient use,

Table 4 Regression Analyses with Optimal ICT Use as the Outcome

Variables	β	F Change	R^2	R^2 Change
Outcome = optimal use of ICTs for communication and information flow				
Perceived leadership in field	.195***	39.89***	.06	—
Expected practice	.131***	15.69***	.08	.022
IT knowledge	.107**	7.49**	.09	.011
Outcome = optimal use of ICTs for stakeholder engagement				
Perceived leadership in field	.165***	28.69***	.04	—
IT knowledge	.104**	10.63***	.06	.016
Organizational size	.105*	5.55*	.07	.008
Marketization	−.172***	6.92**	.08	.010
Competitor scanning	.138**	8.65**	.09	.012
Outcome = optimal use of ICTs for resource acquisition				
Organizational size	.106*	28.99***	.04	—
IT knowledge	.152***	18.67***	.07	.027
Accountability	.128**	12.30***	.09	.017
Perceived leadership in field	.107**	7.40**	.10	.010

Note: Optimal use of ICTs for communication and information flow model: $F = 21.51$; $df = 3,643$; $p < .001$; optimal use of ICTs for stakeholder engagement model: $F = 12.44$; $df = 5,631$; $p < .001$; optimal use of ICTs for resource acquisition model: $F = 17.40$; $df = 4,646$; $p < .001$. ICT = information and communication technology; IT = information technology.
*$p < .05$. **$p < .01$. ***$p \leq .001$.

Table 5 Regression Analyses with ICT Use Efficiency as the Outcome

Variables	β	F Change	R^2	R^2 Change
Outcome = efficient use of ICTs for communication and information flow				
Perceived leadership in field	−.214***	44.86***	.07	—
Expected practice	−.117**	12.34***	.08	.018
IT knowledge	−.092*	5.60*	.09	.008
Outcome = efficient use of ICTs for stakeholder engagement				
Perceived leadership in field	−.176***	30.55***	.05	—
IT knowledge	−.085*	7.56**	.06	.011
Organizational size	−.103*	5.17*	.07	.008
Marketization	.180***	7.86**	.08	.011
Competitor scanning	−.140**	8.91**	.09	.013
Outcome = efficient use of ICTs for resource acquisition				
Expected practice	−.109*	37.65***	.06	—
Perceived leadership in field	−.117**	16.32***	.08	.023
Organizational size	−.087*	7.53**	.09	.011
IT knowledge	−.099*	5.71*	.10	.008
Accountability	−.097*	5.28*	.10	.007

Note: Efficient use of ICTs for communication and information flow model: $F = 21.33$; $df = 3,643$; $p < .001$; efficient use of ICTs for stakeholder engagement model: $F = 12.35$; $df = 5,631$; $p < .001$; efficient use of ICTs for resource acquisition model: $F = 14.97$; $df = 5,645$; $p < .001$. ICT = information and communication technology; IT = information technology. *$p < .05$. **$p < .01$. ***$p \leq .001$.

the negative β values herein indicate greater efficiency of ICT use as these factors increase (and the positive value for marketization indicates less efficient use). Overall, results for optimal ICT fit demonstrate no effect of environmental factors, moderate predictive power for organizational characteristics, and strong predictive power for institutional isomorphic factors.

RQ1 considered the relative importance of environmental factors, organizational characteristics, and institutional isomorphic pressures on NPOs' Website adoption decisions and ICT usage behaviors and can be assessed in part by considering the preceding findings. A consistent pattern emerges in which institutional isomorphic pressures were most predictive, followed by organizational characteristics. The one environmental factor measured was statistically unrelated. More specifically, there was strong support in each analysis for the predictive power of pressures derived from institutional isomorphism, moderate support in each analysis for organizational factors, and no support for environmental factors.

To probe this further, additional analyses were performed to directly evaluate the importance of institutional isomorphic pressures relative to the other factors. To assess the portion of RQ1 regarding (Website) adoption decisions, a binary logistic regression was conducted, with the institutional isomorphism variables entered in a

second block, following the entry of a first block containing all other independent variables. The addition of institutional isomorphism variables provided a significant improvement (block $\chi^2(6) = 49.88$, $p < .001$) to the predictive capacity of the overall model (model $\chi^2(11) = 149.53$, $p < .001$; Nagelkerke $R^2 = .26$), indicating the utility of considering institutional isomorphic pressures above and beyond other factors. With the exception of marketization, all institutional isomorphism variables were significant predictors in the final model.

To assess the portion of RQ1 regarding ICT usage, hierarchical regression (using the enter method) was used to assess the relative importance of institutional isomorphism variables, which were entered in a second block, following all other independent variables in the first block. The inclusion of institutional isomorphism factors resulted in significant improvement in the regression model, with approximately 10% additional variance explained, for all the ICT use factors: information and communication flow (F change = 14.38, $p < .001$; R^2 change = .10), stakeholder engagement (F change = 11.21, $p < .001$; R^2 change = .08), and resource acquisition (F change = 12.48, $p < .001$; R^2 change = .09). Similarly, inclusion of institutional isomorphism variables significantly improved the regression model predicting the *optimal use of ICTs* (explaining, on average, an additional 4% of the variance) for (a) information and communication flow (F change = 5.17, $p < .001$; R^2 change = .04), (b) stakeholder engagement (F change = 5.44, $p < .001$; R^2 change = .05), and (c) resource acquisition (F change = 3.53, $p < .01$; R^2 change = .03). Likewise, institutional isomorphism variables significantly improved the regression model predicting the *efficient use of ICTs* for (a) information and communication flow (F change = 6.05, $p < .001$; R^2 change = .05), (b) stakeholder engagement (F change = 6.06, $p < .001$; R^2 change = .05), and (c) resource acquisition (F change = 5.00, $p < .001$; R^2 change = .04). Thus, institutional isomorphism, even after all other variables/factors had been taken into account, was responsible for significantly more variance explained, across all dependent variables.

Discussion

This study explored a variety of organizational, environmental, and institutional influences acting on NPOs' adoption and use of contemporary ICTs as well as the effects of these influences on their optimal use. In this section, we explore the most significant findings and their implications for theory, practice, and future research. We interpret our findings through particular theoretical lenses—especially that of institutional theory—and these lead us to favor certain interpretations of the findings over others. However, we also acknowledge the possibility of alternative interpretations, an issue to which we return later.

Primary uses of ICTs by NPOs
One significant finding was discerning the primary uses for which NPOs use ICTs: (a) communication and information flow, which included the exchange of messages

and information within and outside the organization; (b) stakeholder engagement, which included reaching out to members and supporters in a variety of ways through ICTs; and (c) resource acquisition, which included acquiring funding and information from government sources. At the time of the survey, NPOs reported that they used ICTs for stakeholder engagement much less than for either resource acquisition or for communication and information flow.

This tripartite distinction is an important finding in itself because it identifies clusters of common ICT uses among NPOs. Prior research has identified a range of specific uses, but no previous research had attempted this sort of comprehensive examination of the primary functions that NPOs themselves see for ICTs. Beyond examining the dichotomous adoption/nonadoption of ICTs distinction (as we did with Websites), this enables us to focus in greater depth on the actual use of ICTs in doing the work of organizations. Future research may benefit from examining more fully this range of uses, which may, in turn, be of use for understanding both technology policy and practice.

Influences on ICT adoption and use

More germane to our primary research purposes was a consideration of a range of influences on ICT adoption and use. Specifically, we sought to provide a more comprehensive exploration of the influences on ICT adoption and use by NPOs compared to previous studies, assessing institutional isomorphic pressures alongside other likely influences. Traditional research has tended to focus on organizational characteristics, essentially arguing that organizations with the necessary resources (such as size and budget) are most likely to adopt new technologies (e.g., Finn et al., 2006; Hikmet et al., 2008). However, research guided by institutional theory has tended to focus on institutional isomorphic pressures as an alternative to traditional explanations. Thus, prior research suggests an either–or approach to assessing influences.

However, we found consistently that both institutional isomorphic pressures *and* organizational characteristics predicted ICT adoption and use. In examining four different measures of ICT adoption/use (Website adoption, communication and information flow uses, stakeholder engagement uses, and resource acquisition uses), we found in every case that a mix of both institutional isomorphic pressures and organizational characteristics was influential. It therefore seems clear that both institutional and organizational characteristics play a role in determining the likelihood of ICT adoption and the nature of ICT use.

More specifically, decisionmakers' IT knowledge, expected practice, competitor scanning, and leadership in the field were the most consistent predictors across all four measures of ICT adoption and use. Table 6 summarizes the role played by the whole range of independent variables in predicting ICT adoption and use across the four analyses. It is noteworthy that expected practice and competitor scanning—two mimetic forces—and decisionmakers' IT knowledge—an organizational characteristic—were positive and significant predictors in every analysis. Indeed, the

Table 6 Summary of Predictors of ICT Adoption and Use

Predictors	ICT Adoption/Use			
	Website Adoption	Communication and Information Flow	Stakeholder Engagement	Resource Acquisition
IT knowledge	+	++	+	+
Leadership in field	++	++	+	
Expected practice	++	++	++	++
Competitor scanning	+	+	++	+
Accountability	−	+	+	++
IT support	+			
Budget	++			
Professionalism	−			
Marketization			−	
Organization size				
Competition intensity				

Note: Significant, positive predictors from analyses are denoted by +. The stronger predictors are denoted by ++. Negative influences are denoted by −. Stronger predictors were determined in the Website analysis to be those with significance levels <.001. In the other three analyses, stronger predictors were those that changed R^2 by at least .02. ICT = information and communication technology; IT = information technology.

strong role of expected practice is consistent with Flanagin's (2000) findings about its influence on FPOs' adoption of Websites. A likely explanation of these findings is that organizations most likely to adopt and use ICTs were those who scanned their peer organizations for emerging technologies and technology-related practices and had the expertise to make sense of and use them. This finding is consistent with perspectives emphasizing social influences on technology adoption and use within organizations (Fulk, 1993; Fulk, Schmitz, & Steinfield, 1990), though our findings extend this work by demonstrating that such influences also operate at the *inter*organizational level (see also Flanagin, Monge, & Fulk, 2001).

Coercive pressure, operationalized as accountability, was also consistently predictive across the four analyses. However, its influence was mixed, in that it had a small, negative relationship to Website adoption, a small but significant positive relationship with communication and information flow and stakeholder engagement, and the strongest (positive) relationship to resource acquisition. It is perhaps not surprising that the strongest influence of accountability was on resource acquisition uses of ICTs, which focus on using ICTs to research, access, and apply for funding. Organizations that are more accountable to government and other funders would seem most likely to use ICTs for these purposes.

Those factors not influential in these analyses are also interesting. Environmental characteristics (e.g., competition intensity) did not emerge in any of the four analyses

of influences on ICT adoption and use, despite the fact that many argue that increased competition among NPOs is a major reason for adopting ICTs (e.g., Lee et al., 2001). However, competition intensity did correlate quite highly with several of the institutional isomorphic variables (especially competitor scanning), so it may be that its influence was simply not apparent because of shared variance with other variables that emerged prominently. Organizational size also did not emerge in any of the analyses of ICT adoption/use, although previous research has been mixed on the effects of organizational size, with some studies finding it to be positively correlated with ICT adoption (Finn et al., 2006; Hikmet et al., 2008) and others finding it unrelated to adoption (Corder, 2001). Professionalism and marketization were also nearly as absent in our findings, each emerging as a weak, negative predictor on Website adoption and stakeholder uses, respectively, and not as a predictor on the other three usage measures. Both correlated moderately with other institutional pressure variables, so shared variance could partially explain their lack of significance in our analyses.

We attempt to shed more light on this pattern of findings in our next section, focusing on the phases of innovation diffusion. For now, it is important to note that our findings demonstrate a consistent pattern of *both* institutional isomorphic pressures and organizational characteristics as predictors of ICT adoption and use. This constitutes a significant advance beyond the ''either–or'' thinking that has guided previous investigations of ICT adoption.

Diffusion of innovations

Our findings are informative for, and may be understood within the framework of, patterns of innovation diffusion. Generally, innovation diffusion patterns follow an S-shaped curve within a social system, whereby adoption of an innovation slowly increases until a cumulative effect quickly spikes the number of adopters (Rogers, 1995), after which the curve eventually flattens. Early adopters, choosing to innovate prior to this cumulative effect, tend to be characterized as leaders or role models who are respected by peers and are sought out for advice. Furthermore, these leaders adopt initially either to enhance efficiency or to maintain (or establish) their status as leaders. Early adopters also provide evaluative information to near-peers; they embrace innovations even when uncertainty is high and help to reduce that uncertainty for later adopters. In the early stages of innovation diffusion, then, adopters are either role models helping to promote change or are influenced by these role models to innovate early (Thatcher et al., 2006; Tolbert & Zucker, 1996).

In institutional theory terms, early leaders spawn mimetic pressures, followed later by coercive and normative pressures, as innovations become the expected or standard practice (Thatcher et al., 2006). Therefore, we would expect that leadership and mimetic pressures will be stronger influences in the early stages of the innovation cycle—that is, for innovations not yet highly diffused. Coercive and normative forces will be stronger influences in the later stages of the innovation cycle—that is, for innovations that are more advanced in the diffusion cycle.

This expected pattern generally matches what we found. While our data are a snapshot and not longitudinal, the evidence suggests that Websites and the three uses of ICTs that we investigated were all in an early stage of diffusion within NPOs in New Zealand at the time of the study—perhaps in a transition to a "middle" stage in which ICT use, at least in some forms, was becoming the norm. We infer this early-middle status first by the low to moderate means for organizations' ratings of the three uses of ICTs (ranging from 2.25 to 3.58 on a 5-point scale). Second, two recent case studies confirm that NPOs in New Zealand are experiencing multiple pressures to adopt and use ICTs but are still struggling to do so (Grant, in press; Henderson, 2008). One of these reported a local branch of a national NPO describing its current technology as "pens, paper, email and the occasional teleconference" but at the same time "recognised the pressure of expectation from community clients who often express surprise at the low level of technology used by the organisation" (Grant, in press, p. 4). A third source of evidence is the small number of NPOs (35%) having a Website at the time of our study, which according to a recent report (Zorn & Richardson, 2010) had increased substantially (to 51%) by early 2009.

Thus, Website and other ICT uses all seem to have been in an early stage of diffusion at the time of our study, and the most consistent predictors of ICT adoption and use across our four analyses were mimetic pressures—specifically, expected practice, competitor scanning, and perceived leadership in the field—along with the organizational characteristic of having decisionmakers with IT knowledge. The mixed results for the predictive power of coercive pressures (i.e., accountability, which had a negative relationship to Website adoption; a weak but positive relationship to information and communication flow and stakeholder engagement uses; and a strong, positive relationship to resource acquisition) can be explained by the early stage of the innovation diffusion process transitioning to a middle stage. Indeed, it may be that Website adoption was not seen as normative at the time of our study, which would correspond with the low level of adoption of Websites at the time of our data collection and the negative influence of normative pressures (i.e., professionalism) on Website adoption. Given this level of adoption, it is conceivable that it may actually have been seen as professional *not* to adopt Websites and perhaps may have even been viewed as frivolous; therefore, organizations that perceive themselves as accountable might be fearful of adopting something that is still not done by the majority. The fact that organizational budget only emerged in the Website adoption analysis also supports a view of Websites as somewhat of an "extra" and perhaps not viewed as a wise investment for those accountable to funders.

The other uses of ICTs, however, were positively related to coercive pressures in the regression analyses, if not normative pressures. Communication and information flow and resource acquisition uses both had means above the scale midpoint. Additionally, we note that the New Zealand government, like the governments of many developed countries, has put a great deal of emphasis on "e-government" in recent years (Deakins & Dillon, 2002), making compliance-related information and reporting available online and expecting communication via e-mail. Similarly,

a number of philanthropic trusts have moved to online funding applications. Thus, NPOs at the time of the survey would have been experiencing some pressure from government and other funders to use ICTs for communication and information flow and resource acquisition. While the mean for stakeholder engagement uses was quite low, a series of conferences for NPOs has been held around New Zealand in 2008 and 2009 called "E-Engage Your Community" that have focused on stakeholder engagement through ICTs (Grant, in press; Henderson, 2008). Thus, some ICT uses seem to have been evolving from the status of "novelty" to expected practice. Our findings, following Thatcher et al.'s (2006) case study research, are consistent with a view of ICT diffusion as initiated by organizational leaders and others who were scanning their relevant environment and emulating leaders' practices.

Institutional learning

An interesting question is how the various forces acting on adoption decisions and usage behaviors operate between levels. In exploring the social NPO landscape through an institutional theoretic lens, these forces become increasingly important to distinguish. On a macrolevel, organizations adapt to general expectations of professional conduct, which may in turn shape the expectations of stakeholders or the institutional landscape at large, creating further institutional isomorphic pressures. Especially important to earlier adopters, organizations are motivated to learn vicariously through their institutional counterparts and emulate ICT adoption practices, creating a more congruent normative landscape. Once ICT adoption becomes "standard practice" in any given field, nonadopters are likely to be more influenced by normative and coercive forces.

As part of this process, organizations also respond to local, microlevel forces by mimicking similar peers (i.e., mimetic pressures). This process of mimesis resonates with the interpersonal forces that Bandura (1977) describes in social learning theory, which specifies the processes through which emulation occurs through attention, retention, reproduction, and motivation, which can unfold and result in actions within a particular context. Specifically, individuals observe others' behaviors and use them as models that guide their own actions within a particular context.

Although "social" learning has primarily been explored in interpersonal or parasocial contexts, the term can also be applied to the organizational emulation of practices and forms of organizing. We thus offer the term *institutional learning* as the process of influence that borrows from the macrolevel perspective of institutional theory and microlevel explanations of social learning theory. In unraveling the links between micro and macroprocesses, we are better able to specify aggregate patterns and underlying mechanisms of organizing (Davis, 2006). Organizational learning has been theorized by scholars explicating the relationship between an organization and its members during processes of adaptation and change bound by rules (e.g., Fiol & Lyles, 1985; March & Olsen, 1975). Organizational learning suggests that organizational decision-making rules culminate from historical self-reflection (Levitt & March, 1988) and also can "spread through a group of organizations like fads or measles"

(March, 1991, p. 106). Even scholars taking a community of practice perspective to organizational learning (e.g., Brown & Duguid, 1991, 2001) acknowledge the influence of the institutional landscape; that is, like institutional theorists, they account for the convergence of practices across organizations. Here, we present institutional learning as a theoretical explanation for *how* this convergence occurs; by coupling the timeline offered by diffusion scholarship (and the varying motivations of adopters over time) and the modeling perspective offered by Bandura's (1977) social learning theory, we attempt to explain how normative practice emerges across institutional landscapes. The observations here elucidate the situational context and process of learning, otherwise underspecified in institutional theory or organizational learning literatures. Institutional learning may be a fruitful area of research for future multilevel scholarship aiming to uncover processes of influence in an intricate social landscape.

In summary, we suggest that ICT adoption and use in our sample appear to be emerging from a very early stage of the diffusion cycle to a middle period in which expectations for ICT use increase. It seems likely that mimetic pressures were prominent influences on all forms of ICT adoption in this early stage and that coercive pressures for ICT use were beginning to be felt for certain uses. Based on analysis of the survey responses, the NPOs that were adopters and users of ICTs tended to be either self-perceived leaders or those who scanned the environment and emulated these leaders and tended to have organizational decisionmakers with the ICT-related expertise to prompt or enable adoption and use. We wish to be cautious in our interpretations, given the limitations of cross-sectional survey data and individual respondents reporting organizational actions and characteristics; as mentioned in preceding paragraphs, alternative explanations of causality are certainly possible. However, these findings provide a provocative picture to be more fully explored using the lens of institutional learning, which may help explain exactly how these various forces play out at the micro level.

The effects of institutional pressures on optimal ICT fit
An important issue addressed in this study is the impact of institutional isomorphic pressures on the fit of ICTs with organizations' practices. Specifically, do these pressures lead to inefficient use or a poor fit with organizational circumstances? This question is important because literature that draws on institutional theory suggests that legitimacy goals are in tension with efficiency goals and that organizations may adopt ICTs for purely symbolic purposes to achieve legitimacy without regard for actual improvement of operations (Meyer & Rowan, 1991; Noir & Walsham, 2007). In contrast to the literature that suggests that institutional isomorphic pressures may prompt organizations to trade efficiencies for legitimacy, our findings suggest that, for the most part, these pressures tended to be positive rather than negative influences on optimal fit. As Table 7 shows, in each of the models, one or more forms of institutional isomorphic pressure had a positive impact on optimal fit or efficiency, and in only the case of marketization's relationship to stakeholder engagement uses did these pressures have a negative impact.

However, the positive effects of institutional isomorphic pressures in every case included leadership in the field and in every case occurred alongside decisionmakers' IT knowledge, and in four of the six analyses, alongside organizational size. A plausible interpretation of these findings is that efficient use of ICTs may be spurred by institutional isomorphic pressures if organizations have the autonomy (i.e., leadership) and resources (i.e., knowledge and size) to find workable structures to make use of ICTs. This also suggests that organizations do not necessarily sacrifice efficiency for legitimacy or vice versa.

We would argue that they may seek solutions that satisfy both, which is compatible with our attempt to move beyond simplistic either–or conceptualizations of influences on ICT adoption and use. Moreover, it seems likely that NPO managers consider multiple goals in deciding whether to adopt innovations, and more often than not would opt for innovations with both symbolic *and* operational value. Thus, for example, in adopting ICTs for communication and information flow, we find

Table 7 Summary of Predictors of Optimal ICT Fit

Predictors	Optimal Fit					
	Optimal Use: CIF	Efficiency: CIF	Optimal Use: Stockholder Engagement	Efficiency: Stockholder Engagement	Optimal Use: Resource Acquisition	Efficiency: Resource Acquisition
IT knowledge	+	+	++	+	++	+
Leadership in field	++	++	++	++	+	++
Expected practice	++	++				++
Competitor scanning			+	+		
Accountability					++	+
IT support						
Budget						
Professionalization						
Marketization			−	−		
Organization size			+	+	++	+
Competition intensity						

Note: Significant, positive predictors from analyses are denoted by +. The stronger predictors are denoted by ++. Negative influences are denoted by −. Stronger predictors were determined to be those that changed R^2 by at least .02. ICT = information and communication technology; IT = information technology.

that expected practices, leadership in the field, and IT knowledge display positive relationships with optimal ICT use and efficiency measures. This may suggest that NPO managers are being prompted to consider ICTs by the practices of their peers and are able to achieve a good fit when they have the internal expertise and the self-efficacy embodied in self-perceived leadership to adopt these practices in sensible ways. It is also worth reconsidering that institutional norms are typically focused on supposed means of enhancing efficiency; that is, they "are often centred on rationalization, efficiency and efficacy" (Noir & Walsham, 2007, p. 318).

As Carmin and Jehlička (2009) concluded, NPOs may find ways to navigate their way through institutional pressures by "strategically alter[ing] the relationship between formal structure and practices in response to the regime in power and the social context in which they are embedded" (p. 19), thus determining their particular responses to such pressures and finding ways to make such pressures work for them. Similarly, Ramanath (2009) found that NPOs, while reacting to institutional isomorphic pressures, did so in unique ways to suit their own goals and constraints. In short, institutional isomorphic pressures did not on the whole appear to prompt NPOs to adopt technologies that were of no practical use. Rather, they tended to prompt organizations with foresight and resources to adopt them in ways that satisfied both legitimacy and efficiency concerns.

Limitations and alternative interpretations

This study has several limitations that must guide interpretation of the results. First, we collected cross-sectional data, which is of course not ideal for assessing temporal causality—in this case, the causes of ICT adoption and use. Second, we relied on surveys completed by individuals to draw inferences about organizationally experienced pressures and organizational actions; although this is common and accepted practice, it is limited by the capacity for any one person to speak accurately on behalf of the organization. Furthermore, because we asked that the most IT-knowledgeable person in each organization complete the survey, respondents may have occupied one of several roles (e.g., CEO, IT manager, or volunteer), and it is not possible to know with certainty which among these is ideal for each organization in our study.

Given these limitations, it is important to acknowledge that there are plausible, alternative interpretations of the findings. For example, consider the finding that decisionmakers' IT knowledge, expected practice, competitor scanning, and leadership in the field were the most consistent predictors of ICT adoption and use. Starting from an institutional theory lens, we interpreted this to suggest that NPOs most likely to adopt and use ICTs were those who scanned peer organizations for emerging technology-related practices and had the expertise to make sense of and use them. However, the reverse causality is also possible: It may be that organizations that adopt ICTs subsequently became more conscious of and interested in other organizations' practices, developed more ICT-related expertise, and began thinking of themselves as leaders in the field. Testing these competing explanations, as well as

potential alternative explanations in relation to our other findings, requires future research that invokes a longitudinal design.

Conclusion

This study contributes to the limited research on ICT adoption and use in the NPO sector (Finn et al., 2006) by providing a more comprehensive exploration of ICT adoption by NPOs compared to previous studies and by assessing institutional isomorphic pressures alongside organizational and environmental influences. It also extends the application of institutional theory into organizational communication by considering the question of how institutional forces affect efficient and optimal use of ICTs.

The findings suggest some important challenges and extensions to existing research and theory. Overall, the findings suggest that, in contrast to prior research that suggests an either–or approach to assessing influences on ICT adoption and usage—that is, explaining ICT adoption and use either as a function of organizational/environmental characteristics or institutional forces—we found consistently that both institutional isomorphic pressures *and* organizational characteristics predicted ICT adoption and use. In particular, decisionmakers' IT knowledge, expected practice, competitor scanning, and leadership in the field were consistent predictors across four separate analyses of ICT adoption and use. This may suggest that the NPOs that adopted and used ICTs tended to be either self-perceived leaders or those who scanned the environment and imitated these leaders and tended to have organizational decisionmakers with the ICT-related expertise to prompt or enable adoption and use.

Furthermore, in contrast to the literature that suggests that institutional isomorphic pressures may prompt organizations to trade operational efficiencies for legitimacy, our findings suggest that, for the most part, these pressures tended to help rather than hurt optimal fit. Efficient use of ICTs, at least in the early phase of innovation diffusion that characterized NPOs in New Zealand at the time of our study, seems to have been spurred by institutional isomorphic pressures if accompanied by the autonomy (i.e., leadership) and resources (i.e., knowledge and size) to find workable structures to make use of ICTs.

The study provides a more complex picture of ICT adoption processes and the complementary roles played by both organizational features and institutional forces. As ICTs become even more prominent among all organizations, and particularly among NPOs, this knowledge becomes increasingly important, as does its continued elaboration and articulation.

Acknowledgments

Notes

1   As noted in the method section, ICTs are computer-based technologies used to create, access, store, and distribute information or to communicate between individuals. Examples include electronic mail, videoconferencing, electronic databases, intranets, and extranets, among other tools.

2   We intend the term *nonprofit organizations* to be roughly interchangeable with *civil society organizations*, *not-for-profit organizations*, and *nongovernmental organizations* or, as they are typically called in New Zealand, *community and voluntary organizations*.

3   Flanagin (2000) used the label *institutional pressures* for this set of items. We have used the label *expected practice* to distinguish this particular scale from the larger set of institutional isomorphic pressures assessed by other factors.

4   Listwise deletion resulted in this large proportion of missing cases. We opted to drop these cases rather than imputing values for this multivariate analysis because imputation can distort coefficients of association (Kalton & Kasprzyk, 1982). A variety of diagnostic methods was used to determine if nonresponses were problematic, but no meaningful indicators of patterned (non)responses, respondent fatigue, or other issues were discovered.

Appendix

Table A1 Variable Operationalization Summary for *Current ICT Use* (following principal components factor analysis with varimax rotation and deletion of items with low primary loadings and/or high secondary loadings)

Variable	Items	α	Proportion of Variance Explained (%)	Item Primary Loading	Item Secondary Loading
Communication and information flow	● Sharing information such as files and data with other people within our organization	.86	42	.78	.26
	● Communicating with other people within our organization			.75	.21
	● Communicating with people outside our organization			.74	.39
	● Sharing information such as files and data with people outside our organization			.68	.19
	● Creating a record of what we do			.66	.31
Stakeholder engagement	● Providing training to others	.81	9	.73	.18
	● Conducting advocacy campaigns			.66	.22
	● Acquiring training from others			.63	.39
	● Making computer technologies available to clients or members			.62	.24
	● Recruiting staff and volunteers			.62	.25
Resource acquisition	● Applying for government and private funding	.86	7	.80	.23
	● Researching funding sources			.76	.28
	● Accessing government information			.70	.35

Table A2 Variable Operationalization Summary

Variable	Items	α
Competition intensity	• There is tough competition in our sector based on the quality of our services • There is tough competition in our sector for funding and support • Our organization must remain competitive with others in our field	.74
Expected practice	• *Normally, organizations that do what we do, *do not* use ICTs • Organizations such as ours rely heavily on ICTs these days • Typically, organizations in our field rely heavily on ICTs	.78
Competitor scanning	• Information on organizations that provide similar services is considered important for decision making • Our organization actively keeps abreast of new and innovative practices used by other organizations in our sector • We monitor the moves of "competitors" very closely	.63
Marketization	• Our organization views itself as operating in a marketplace in which we compete with other organizations for funding and support • Our management practices emulate what is done in the private sector • Our organization uses business practices typical in the private sector • Our organization behaves like a business these days	.72
Accountability	• We must justify the way our organization does things • Our organization is accountable to a higher authority (e.g., government, board, or funders) for its actions • Government or funding compliance requires us to report statistics on our activities • We must collect data systematically in order to comply with government or funders' requirements	.80
Professionalism	• Our organization is expected to behave "professionally" • There is a high expectation of professionalism in our organization • Our organization tries to project a professional image • Our organization prides itself on having staff who are experts at what they do • There is pressure on our staff to enhance their qualifications	.80

Note: Items with an asterisk were reverse coded.

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