Technology Challenges in Canadian Non-Profit Organizations: Why Progress is Hard

by

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BA, Simon Fraser University, 2003
BCS, University of British Columbia, 2022

AN ESSAY SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

in

The Faculty of Graduate and Postdoctoral Studies

(Computer Science)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

September 2025

The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, the essay entitled:

Technology Challenges in Canadian Non-Profits: Why Progress Is Hard

submitted by Jason Hall in partial fulfillment of the requirements for

the degree of Master of Science

in Computer Science

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Abstract

The Canadian non-profit sector plays an important role in providing vital services, employs many workers, and contributes significantly to the country's economy. As social issues continue to increase, more Canadians than ever are relying on non-profit organizations for basic needs. To keep up with the growing demand, these organizations require effective use of technology and people to support it. However, the sector faces unique financial constraints and staffing challenges that hinder appropriate investments in technology. This project explores some of the unique technology-related challenges of the non-profit sector with brief overviews of the causes, descriptions of some current attempts to mitigate the obstacles, and some discussion of potential next steps towards better understanding. The ultimate goal is that a greater understanding of the problems could help nudge efforts toward effective solutions.

1 Introduction

The size of the non-profit sector is significant and, consequently, has a significant effect on the economy. In BC alone, more than 31,000 NPOs employ approximately 335,000 [25], or 11.4% of the 2.95 million workers in the province [33]. The economic impact is that $28 billion has contributed to the province's gross domestic product (GDP) [25]. Across Canada, charities alone (without NPOs) employed 10.8% [8] of Canada's 16.0 million full-time workers [32] and provided 8.0% of Canada's GDP in 2021 [8] and 8.2% in 2022 [5].

The sector provides services that are important for the health and well-being of many Canadians and can be considered "the cornerstone of community services in Canada," [14] providing services in every corner of the country. The value of these services is growing. One in five Canadians now uses the services of NPOs and charities to meet basic needs, and almost 70% of those are accessing such services for the first time [8].

The need for NPOs is growing more rapidly than their capacity. Providing various services requires systems and infrastructure, which today essentially means digital technology. But, despite its good intentions and best efforts, the non-profit sector in Canada is significantly lacking the technology needed to remain effective for the greatest number of people.

This project explores and summarizes some of the most significant reasons that organizations in the non-profit sector are not using digital technology to its full extent. In Section 2, I begin by clarifying the organizations of focus and why they are of notable interest. In Section 3, I describe some of the related works and their limitations. In Section 4, I will explain some of the background for this project, how the project shifted over time, and describe how the research methodology and sources subsequently changed. Then, in Section 5, I will explain the overall problem broken down into three types of challenges: financial, staffing, and technical. In Section 6, I will examine how NPOs strive to overcome these challenges and assess the effectiveness of their approaches. In Section 7, I discuss some limitations of existing work and consequent knowledge gaps on this topic and potential ways to make more progress. Finally, in Section 8, I discuss the contribution of this work and suggest some potential values that could arise from it.

2 Background and definitions

This project focuses primarily on small non-profit organizations. NPOs are legal entities that exist to benefit society rather than to generate profit for owners or shareholders. NPOs can have a single mission to benefit a particular population, such as a housing organization helping the homeless, or a set of related missions for a range of populations, such as a community services organization offering various programs for children and families.

2.1 Non-profit organizations vs. charities

No non-profit organization can use income to financially benefit their members (other than through employment compensation). Charities are a type of non-profit organization and comprise about 47% of NPOs [6]. Revenue Canada defines some key differences between charities and other NPOs [11] that are important to understand.

- NPOs can operate for any purpose other than to generate profit. Examples are chambers of commerce, amateur sports teams, social clubs, and volunteer fire departments. They can have various purposes, but they do not exist to generate a profit. Charities are more specific and must "operate exclusively for charitable purposes." Examples can be the Red Cross, food banks, or a thrift store that supports a hospital program. The organization exists for a charitable purpose.

- Charities must be registered. NPOs are not required to be registered. This is a notable difference because some reports about the non-profit sector use lists of registered charities to find survey participants. Unregistered NPOs are more difficult to discover.

- Charities can issue receipts for donations that donors can use for tax filing purposes. NPOs are not registered and cannot issue receipts. This is another notable difference because the availability of a tax receipt can affect donor interest in supporting the organization. Declarations on tax returns also means that donations to charities can be tracked from tax filing data.

For this project, I use the generic term "non-profit organization" or "NPO" to refer to organizations unless there is a specific need to identify an organization as a charity.

2.2 Focus on smaller organizations

Data from Statistics Canada indicates that 75.3% of NPOs have fewer than 5 staff and only 1.3% have at least 100 staff [5].

Where feasible, this project focuses on small organizations with lower budgets and up to about ten staff. These organizations are less likely to have dedicated technology workers in-house.

Despite the fact that most NPOs are small, most available reports about the non-profit sector tend to be based on surveys of larger organizations with well over ten staff and technology budgets over $10,000. The difference can likely be attributed to multiple factors, such as the unbalanced representation of the organizations responding to survey requests and the counting of volunteers as staff. (Volunteers are not included in Statistics Canada data.)

Smaller organizations have different resources and challenges than larger organizations. Among organizations with 10 or fewer staff, only 13% tend to have a dedicated technology worker (compared to 25% of larger organizations), and almost 60% report limited technical skills in the organization [7]. Understandably these organizations tend to lack a technology strategy to drive digital adoption.

3 Related Works

Most of the references for this project are reports published by organizations focused on different aspects of the non-profit sector. Many of the reports are comprehensive, but every resource has some limitations. Many reports are primarily a compilation and interpretation of survey results [7, 14, 20, 23]. Some discuss their results, but the discussion is mostly based on the results of the associated survey without a larger context. Many reports are based on wide populations of NPOs so include large organizations [7, 8, 14, 20, 23, 24]. Some reports do not include small organizations at all [21]. Large and small organizations have different challenges. Large organizations have more resources and are more likely to have dedicated tech staff, a technology budget, and a technology strategy. Finally, many survey results and associated interpretations seem to vary significantly, depending perhaps on survey participants or the focus of the surveyor. To account for differences, I sought to verify all information in this project by comparison with multiple sources; I ignored references that are not based on reliable sources or appropriate sample populations; and I dropped topics that could not be sufficiently supported with reliable references.

4 Methodology

In this section, I will explain some of the inspiration and background for this project, and how the project shifted over time. I will also explain the purpose of the project and the steps taken in the research.

4.1 Inspiration for this project

The original ideas for this project came from my own experience and exposure to a number of NPOs in both Canada and Japan that varied widely in size, scope, and mission. I worked with some as a volunteer, some as a paid employee, some as an external consultant, and two as a board member. My roles varied widely but technology was a common thread between most of them. As an IT professional, I was in demand as a volunteer or advisor for many small NPOs and often given full access to everything to understand the existing landscape. Due to financial constraints, I often sought free technical solutions and found countless options available. Like other professionals I favoured familiar solutions, but experience taught me to prioritize organizations' needs and find solutions that fit well. Many organizations already had some existing tools that did not fit well together.

Over time, I saw a number of commonalities and issues that many organizations faced. Technology-related issues are common due to a lack of technology, a mess of disconnected tools, or outdated and unmaintained technology. The result is that many organizations lack the technological infrastructure sufficient to support their work, or have technology that is not being used to full potential. Workers in these organizations are left doing tasks manually that could be streamlined, or they are using a mix of tools that are not integrated.

As an example, I once stepped in to help a housing organization with its technology when the former outside consultant disappeared. I knew people who had wanted to volunteer with the organization, but had received no responses to their queries. I discovered that the organization's volunteer information was spread across six different systems held by different people, including paper forms, multiple spreadsheets, and an outdated Access database. Information about potential volunteers accumulated, but was typically lost before it could be integrated.

Through this experience, I wondered how organizations with limited technical resources could find the right solutions for their particular needs, especially small organizations without access to experienced technical knowledge. This led to a larger question about technological challenges for NPOs

in general and what could be done to help them, in particular, small ones with little to no budget.

4.2 Intention for this project

This project explores technology-related challenges of NPOs rather than just reporting data about organizations. Few academic papers related to non-profit technology challenges seem to exist or were published long enough ago to be less relevant today. Technology, and topics related to technological solutions, change quickly. For example, availability and opinions about cloud services change almost weekly. Many comprehensive reports exist from before the pandemic, and then the pandemic changed the way many organizations work and the technology they use. Some reports that seem applicable have not been updated or repeated in twenty years [2, 17].

The intention of this project is to indirectly raise the capacity of NPOs by providing current information to organizations, donors, and other stakeholders so they might better understand current needs and prevailing circumstances and make more informed decisions. Following some exploration of the challenges of technology and the attempts at solutions, I will discuss some potential ways the information in this project could be used and provide some suggestions for future work 7.

4.3 Steps in the research process

The references and sources of information for this project changed as the research progressed from my experience to interviews to online events to research papers and reports.

1. The initial research question and topic exploration were based on my experience working with various NPOs. However, knowing that my experience is limited, I listed some of my assumptions about technology and non-profits and did some initial research to verify or disprove them.

2. For more perspective, I interviewed two people who work with many non-profits locally across British Columbia [15, 16]. (See Appendix 1.) The interviews supported some of my assumptions and showed others to be incorrect, or at least did not match the experience of the interviewees.

3. To continue exploring current trends, I started participating in webinars and online events and finding people who seemed to be experts

in different aspects of the non-profit sector [1, 12, 22, 29]. This led to discovering organizations that support or report on the non-profit sector. Between such organizations, live events, links from people, and additional searching, I developed a more comprehensive collection of relevant literature related to technology in NPOs.

4. Most of the reports I reviewed are based on surveys of NPOs, but there is little consistency between surveys with regard to questions or intended outcomes. This increased the difficulty in making direct comparisons between them. I also found that many reports are based on a small number of respondents or are targeted at specific types of organizations. For example, a training company surveyed organizations from its member database about their training budgets and practices. The results suggested higher training budgets than could be corroborated by other reports. I avoided such reports, as well as those that were unclear about their methodology or survey population or that had any apparent bias toward particular results.

I gave more weight to reports that focused on, or at least included, smaller organizations. I also favoured more recent reports or those that had been updated recently. My preference was for reports produced after the Covid-19 pandemic so that any information would be more relevant to the current state of the non-profit sector. In many cases, I attempted to find Statistics Canada data to at least corroborate some of the data from each report. I dropped topics and discussion points that were based on information that could not be verified or corroborated elsewhere.

5 Categorization of NPO challenges

The methods described above reveal that the non-profit sector has an overall lack of technical capacity and a related digital skills gap. These limitations reduce the ability of NPOs to provide high-quality and efficient services and constrain the overall effectiveness of the sector. In addition, financial and staffing constraints that are particular to the non-profit sector exacerbate these technical challenges.

I categorized the main challenges into three areas that build on one another. In the following section, 5.1, I describe financial challenges that are somewhat unique to NPOs due to their sources of funding. In Section 5.2, I describe staffing challenges that are somewhat unique due to a combination of finances, reliance on volunteers, and the people who are attracted to work in the sector. Finally, in Section 5.3, I describe technical challenges that are exacerbated due to unique financial and staffing constraints.

5.1 Financial challenges

NPOs rely on different sources of funding depending on their purpose, services, and size. For example, across Canada, different levels of government provide the largest proportion of funding for 43.6% of health-related NPOs and 42.5% of social service NPOs. Individual donations are the most significant funding source for 70.3% of smaller NPOs. Other organizations, such as those for business and professional associations and unions and for sports and recreation, rely mainly on membership fees [5]. Reliance on these sources of funding presents unique challenges due to the changing trends and problems revealed in my research.

Increasing demand

The demand for services has been increasing, but the capacity to meet that demand has not kept pace. In 2023, 46.1% of Canadian non-profits reported a higher demand for their services, notably in social services and health organizations, but only 24.3% of organizations reported increased capacity to help meet the higher demand [5]. If this trend continues, NPOs could be forced to reduce services in individual cases. Their capacities are effectively being spread more thinly.

Reliance on government funding

In BC, the government provides roughly 30% of the funding for community non-profits that offer services such as social programs, family services, or healthcare and housing support. In these cases, such organizations are contractors and provide services on behalf of the government. However, funders typically support only individual programs rather than entire organizations. A comprehensive community services organization, for example, might offer various family-related programs such as counselling, child development, and women's health; but each program might be partially supported by different government entities. The rest of the organization's funding might come from private donations and organizational activities such as fundraising and fee-based services [3]. Matching funding to individual programs adds complexity to administrative processes, which in turn increases overhead. Fluctuations in funding across programs also force organizations to make program decisions and referrals based on funding rather than on need as determined by people working on the front lines.

Fewer people donating more

The number of Canadians who donate to charity has decreased by approximately 18% over the past decade, from 82% in 2013 to 60% in 2023, and is part of a "gradual decline spanning decades" [8]. However, overall donations to Canadian charities increased an average of 2.3% each year from 2015 to 2021 [8]. This indicates that fewer donors are giving larger amounts, increasing the vulnerability of the sector. Each lost donor becomes a greater financial loss, so more effort or expense might be required to retain them.

Restrictions on funds

A challenge for NPOs that rely on external funding is that donors often restrict the use of funds to specific programs or services. Consequently, a comprehensive organization with multiple service programs might have donations specifically allocated to any single program or subset of programs. In addition, both public and private donors want their money used for the cause and typically restrict the amount that can be used for overhead and general expenses. Staffing, administration, and technology expenses, for example, can be difficult to connect directly to delivery of a particular program. Overhead costs can vary between organizations from 1% for small, local, volunteer-run organizations to 35%. (The Canadian Revenue Agency might begin to question organizations that report overhead expenses over

35% [10].) In a survey of larger registered charities (1% of charities accounting for nearly 50% of all donations), Charity Intelligence found the average overhead to be 27% [9]. (Similar data for non-charity non-profits could not be found.) In some circumstances, and for smaller organizations, private donors might allow only 5-10% of the funds to be used for overhead costs [15, 16].

As a result of donor restrictions, NPOs track restricted and non-restricted funds separately. Restricted funds are required to be used for purposes stated by the provider. They might be limited to program delivery costs (rather than overhead), a specific program, such as children's health, or even a named expense, such as medical devices for children. Unrestricted funds are not specified and may be used as the organization chooses. Excessive restrictions on funding limit organizations from using funds for other expenses and overhead, such as investments in technology and support staff, which can both increase overall organization capacity.

Use of funds for technology

The greatest barrier for NPOs to gain appropriate technical capacity is limited financial resources [7, 13]. In a 2023 survey of Canadian charities, 80% agreed that increased technology use would improve their service delivery, and 60% believed their services will be affected if they do not improve their technology. However, 43% believed that their funders and donors do not want them to invest in technology [7].

Funders' aversion to investing in technology might be part of the reason that many organizations do not include tech-specific reporting to funders, so the need and costs for digital technology are essentially buried [24]. Almost 60% of organizations do not clearly indicate tech-related expenses with separate entries in financial records, often combining them with general office supplies or administrative overhead [24], and rarely report technology spending outside the organization [24]. Less transparency about technology costs and spending makes it more difficult for funders and other stakeholders to understand the associated challenges.

As a result of allocation restrictions, NPOs might have sufficient funding to provide their core services but limited budgets to cover operational overhead and nothing left for investment in appropriate technologies to operate more efficiently or improve capacity. Improvement becomes not just a matter of simply investing more, but of being strategic about where to invest the limited resources that are available [24]. This leads to the next challenge.

5.2 Staffing challenges

The second greatest barrier for NPOs to gain appropriate technical capacity is a lack of knowledge about their requirements and inability to find appropriate people [7, 13].

NPOs have fewer tech workers

Limited financial resources make it more difficult for NPOs to attract and retain suitably qualified personnel compared to for-profit organizations. NPO employees generally earn significantly less salary for the same work as their for-profit counterparts, who can also have access to financial benefits such as company equity and performance bonuses. This is especially pronounced with technology workers. Surveys indicate an average 27% lower salary for non-technical workers, and an average 33% lower salary for technical workers in the non-profit sector [14]. However, the salary discrepancy is not entirely due to limited funding. Funders and the general public typically consider high operating costs unacceptable in the non-profit sector. Consequently, it is difficult for organizations to justify paying market rates for employee salaries [14], especially for workers who tend to earn higher salaries.

Lower salaries make the non-profit sector less desirable, likely contributing to the reduced number of tech workers. According to data for 2021 from Statistics Canada, there are 792,725 workers in the Canadian non-profit sector [14], and 6,515 are considered technical workers [14]. So 0.8% of workers in the non-profit sector are technical workers. In comparison, 5% of workers outside the non-profit sector are classified as technical workers [14].

Due to real or assumed funder restrictions, as previously described, 23% of organizations report an inability to allocate funding to staff with specific technical skills and responsibilities [7]. Perhaps, as a result, 46% of organizations report that they do not have the "skills, expertise, and knowledge" to fully utilize technology [7]. Having fewer qualified technical workers means lower aggregate technical knowledge for NPOs and, consequently, reduced ability for organizations to increase their digital capacity or keep up with current trends.

Reliance on volunteers

Limited resources, and the stigma attached to people being paid well in the sector, make it difficult for NPOs to attract well-qualified staff. Fortunately, the nature of the sector makes it easier to attract volunteers. This is a benefit that for-profit organizations typically do not have. According to

Statistics Canada, only about 18% of NPOs have no volunteers. Almost 45% have up to 20 volunteers, and 8% have at least 100 volunteers [5]. Volunteers seem to be an available resource. Unfortunately, many people attracted to the non-profit sector are motivated primarily by commitment to a cause rather than by career advancement or skill development. They may be enthusiastic, but often lack the technical or professional skills of people in comparable roles in for-profit organizations. Similarly, volunteers are generally driven by personal fulfillment, purpose, or social connections rather than career benefits. They tend to have less commitment than paid staff, who are more likely to rely on their roles for income, benefits, and professional advancement. As a result, volunteers are more likely to leave a role when the work becomes dull or difficult rather than push through and gain knowledge from the experience. Relying on volunteers for technical roles consequently could leave organizations with lower aggregate technical knowledge, which correlates with lower digital capacity.

Turnover

For several reasons, it is not surprising that the non-profit sector suffers higher staff and volunteer turnover rates, though details are elusive. Depending on the source, the reasons people leave vary. One report indicates that the top three reasons people leave are for better opportunities (45%), more compensation (41%), and a lack of career growth (38%) [20]. Another indicates that the top reasons are for higher pay (61%), feeling burnt out (41%), and feeling underappreciated (37%) [31]. It is unclear why survey results differ so much, but compensation is a common reason. Paid employees in the non-profit sector are more likely to have a university degree (73.6%) compared to workers in general (55.8%) but, on average, make 26.4% less income [4].

Regardless of the organization or the reason, staff and volunteer turnover has consequences, and one of the most significant consequences is the decrease in organizational knowledge [15, 16, 20]. Loss of paid staff and volunteers reduces accumulated organizational knowledge and skills, directly affecting organizations' productivity and efficiency. Processes can be disrupted and data can be lost. Replacement workers also bring new knowledge and opinions that can be beneficial. However, replacing technology workers can result in a patchwork of digital tools that are not fully understood or integrated [15, 16].

5.3 Technical challenges

Implementing the right technology is difficult for any organization. There are many factors to consider, different costs for each option, business requirements that can change, and security considerations that are always shifting. As with financial and staffing challenges, the non-profit sector has particular technical challenges that are worth noting.

Requirements of digital technology

Two different sources of requirements must be considered. Internally, an organization will have its own operational, security, and efficiency requirements. Externally, associated organizations might impose requirements for record-keeping, privacy, and reporting.

Funders, accreditation organizations, and government entities that oversee services for people can each have different record-keeping and reporting requirements. Examples of such entities are the Ministry of Children and Family Development [27], BC Housing [19], and Vancouver Coastal Health [18]. Since NPOs can provide confidential services to vulnerable populations, outside organizations might also impose data handling and privacy restrictions. The Canada Privacy Act extends to contractors handling personal information on behalf of government institutions [26].

So, a non-profit organization can have layers of overlapping record-keeping, privacy, and reporting requirements imposed by its funding agencies. In the case of privacy, it could mean adhering to the most stringent requirements to address all privacy concerns. For record-keeping and reporting, it could mean recording and reporting information in different ways, effectively duplicating effort and storage requirements. These requirements add complexity to how organizations must use, store, and secure their data and consequently affect decisions about what digital tools they can use.

Varied definitions of digital technology

Organizations of different sizes can define digital technology in different ways. Larger organizations are more likely to think of technology in terms of automation and service delivery. Smaller organizations tend to consider more basic areas, such as their website and social media management [7]. Consequently, it would be more difficult for smaller organizations to clearly understand their needs and how technology could enhance their organization's capacity. As a result, they might not be looking in the right places or asking the right questions when opportunities to invest in technology arise.

This might not be unique to the non-profit sector, but limited access to technical knowledge would magnify the challenge.

Technology costs

While an earlier section explored overall financial considerations for NPOs, technology tools in particular have specific costs to take into account. Every organization would need to consider all costs associated with any technical solution, such as the initial purchase cost, installation costs, ongoing licensing or subscription costs, and maintenance costs. (This ignores any personnel costs involved.) These are complicated for NPOs because of the restrictions in funding described above. For example, hardware infrastructure is not an eligible expense for 14% of organizations [7]. Software subscriptions are not eligible for 20% of organizations [7]. The basic pattern is that while costs for technology are difficult to justify to funders, ongoing or maintenance costs are even less likely to be approved. Any organization cannot invest in technical capacity if they expressly cannot spend money on hardware, software, or associated maintenance.

6 How organizations attempt to address the challenges

Organizations typically have at least ten paid staff before a dedicated technology worker is added, although this threshold varies widely depending on the organization, the funding, and the type of services [7, 15]. Before an organization has at least one suitable paid technology worker available, there are only a few ways to handle the addition of a new technical job function.

I list some common approaches that underfunded organizations take to cover technical job functions, and discuss some challenges or pros and cons with each approach. Considering the challenges and limitations with these solutions, the intention is to better understand the scope and complexity of the larger issues. These are not viable long-term solutions when resources are limited.

- Train existing staff (Section 6.1)
- Hire qualified staff (Section 6.2)
- Hire outside contractors (Section 6.3)
- Let someone figure it out (Section 6.4)
- Find a qualified volunteer (Section 6.5)

Most of these options require consideration of financial resources. Additional funding could potentially be raised or requested from funders, but, some of the financial challenges have already been discussed in section 5.1 above.

6.1 Train existing staff

According to a report by the Canadian Centre for Non-profit Digital Resilience (CCNDR), 62% of organizations attempt to "close the digital skills gap" by training existing personnel [13]. However, training seems to be a suitable solution only when the new job function aligns with an existing role, and someone simply needs to gain or expand a skill. More significant training is typically required for someone to take on new functions that are not related to their existing role. Even when training is a suitable option, 44% of organizations that pursue it indicate that cost is a barrier [13]. Consequently, free training is a common preference, but 38% of organizations have difficulty finding suitable training options [14].

6.2 Hire qualified staff

The same report indicates that 40% of organizations attempt to address gaps in digital capacity by hiring new staff [13]. However, this is a relatively high-cost solution. When hiring to address digital skills gaps, 47% of organizations report difficulties in meeting salary expectations [13]. In addition to finances, lack of knowledge also presents challenges, with 41% of organizations indicating difficulty in finding suitable people [13] and 16% indicating that they did not know how to find appropriate people [13].

6.3 Hire outside contractors

Many job functions can typically be outsourced to external contractors. This tends to be another relatively high-cost solution and comes with other considerations. In one survey, organizations hired outside consultants for technology projects 65% of the time [24], but in a survey of Canadian charities, only 15% of the survey respondents consider technology providers trustworthy, and 47% consider them somewhat trustworthy. Clearly, trusted sources of information or consultation are necessary [7]. In addition to financial considerations, the hesitation to engage external contractors might be related to intellectual property, data security, or digital privacy concerns. Similar to hiring new staff, NPOs might have difficulty finding contractors that are both available and qualified. The surveys mentioned just above indicated how many organizations hired outside contractors but provided no indication about the suitability of the contractors or if they were experienced with issues and challenges specific to the non-profit sector.

6.4 Let someone figure it out

When financial resources are not available or the new job functions are not considered significant enough to justify the investment, there are a couple of options that do not directly involve financial cost. One common option is to assign technology management as side-of-desk work to an existing staff person with other job duties and typically no formal technical training. Among organizations with less than $1 million in revenue, 53% report reliance on these “accidental techies” [7]. In some organizations, it also seems not uncommon for some of the technology work, or at least advice, to come from board members or external associates of people inside the organization. However, relying on external people who are unpaid and not on a formal contract can raise significant privacy and security concerns.

6.5 Find a qualified volunteer

The other option without financial cost is to find qualified volunteers who are already involved with the organization to take on technology tasks. As with hiring new staff or contractors, finding the right volunteer might be difficult, and volunteers tend to have higher turnover rates than paid staff [15]. An additional challenge is that volunteers and paid employees have different relationships and commitments with organizations. There might be no recourse if volunteers fail to perform expected tasks or make mistakes that result in loss or harm to the organization or its stakeholders. Particularly with social service organizations, funders and accreditation organizations are likely to have security or privacy requirements that restrict access to internal personnel.

7 Knowledge gaps and future work

With limited structured information on this topic, research required exploring a variety of resources. Regardless, I found notable gaps in available information. In this section, I highlight some of the existing knowledge gaps and suggest some potential directions for future work. Future work to fill knowledge gaps about the sector and individual challenges, such as those described, would increase understanding of the challenges and scope, and might help reveal directions to look for potential solutions.

The only common aspect of organizations in this sector is the fact that they do not exist for the primary purpose of earning profit. NPOs can be vastly different, so summary data about their resources and challenges is generic and diluted. Some reports include a breakdown of causes on which survey respondents focus (e.g., poverty, health, education), but no attempt is made to analyze data particular to different causes. Organizations and their circumstances can vary significantly because of their primary cause or mission. For example, social services organizations might have easier access to government funding but have more data security, privacy, and staff qualification requirements if they work with vulnerable populations. In contrast, religious, arts, or sports organizations might not be considered essential, likely have far fewer regulations to follow, and might attract volunteers because of personal interest and social aspects rather than a sense of contribution to the greater good. As mentioned in the financial challenges section 5.1, different types of organization can also have very different funding sources.

To better understand organizational needs and potential solutions, other categorizations might also be considered. Does the organization provide services to people? Does the organization provide essential services? Does the organization require accreditation or certified staff? Does the organization provide services on behalf of a government entity?

Data collection also seems to be affected by the distinction between nonprofit and charity status that many reports do not seem to take into account. Charities must be registered, so it is easier to find them, count them, and invite them to participate in surveys. Rough estimates, though, seem to indicate that registered charities account for only about one third of nonprofit organizations.

The size of organizations also varies significantly from one or two individuals to thousands of paid employees. Organizations of different sizes can also have very different considerations in terms of resources and challenges. This would also affect data collection. Small, busy, or understaffed

organizations might be much less likely to respond to survey invitations and provide data. The optional nature of many surveys and the self-reporting format introduce additional data issues. Optionally, there might be value in gathering and comparing qualitative data from group representatives, such as specialists or organizations that work ins multiple related organizations. Vantage Point [28], for example, provides resources for NPOs to run better. Board Voice [30] acts as a hub for social services organizations. Many organizations belong to some sort of association or informal group. Knowledgeable people connected with many organizations might have insights into trends, common challenges, and typical attempted solutions. Examples of such individuals are the representatives from TechSoup [15] and Board Voice [16] who were interviewed for this project.

8 Discussion

In previous sections, I provided a foundation for better understanding the technology challenges of non-profit organizations by presenting some background and definitions 2 and describing existing work 3. Then I explained the methods I used to investigate the topic 4. During the research, I found key technology-related issues for NPOs that I assembled into logical categories for overview and easier understanding 5. To help put the challenges into context, I then illustrated some of the ways that non-profit organizations attempt to address the challenges 6 and some of the pros and cons of each approach. In the process of assembling my findings, I discovered some knowledge gaps in available information and came up with some suggestions of ways to fill them 7.

Even without offering possible solutions for the given challenges, the information assembled in this project could be used numerous ways and could potentially have some positive effects.

The challenges section 5 could provide agencies and organizations that support NPOs with some insight into technology challenges and how they might be categorized. Non-profit organizations might find the sector-wide observations helpful in fundraising efforts. The observations might provide some insight to organizations about factors that affect donor interest and motivation, and help them to better illustrate their needs for increased digital capacity or unrestricted donations. Grant writers, fundraisers, and others in business development might find some information to help guide nonprofits in their fundraising efforts. The structured descriptions could provide some perspective for potential donors to better understand the challenges of non-profit organizations related to fundraising, technology, and capacity building. This could hopefully help donors to support their preferred organizations and causes more effectively.

Understanding the challenges 5 and common attempts to solve them 6 could affect how organizations consider hiring and volunteer recruitment efforts so they find people with better suitability and potential for effective contribution. It might also inspire donors or organization directors to encourage better hiring. The list of challenges and attempted solutions could inspire someone to address a particular challenge, or work towards a solution for a particular set of related issues. This could lead to new technology-related services for NPOs, toolkits or tutorials for non-technical staff, or development of a new technical solution or system.

For individuals, this information could inspire a technology worker who might be looking for a way to have more effect or meaning in their work. It is

not an area currently saturated with technology workers. Anyone in an early career stage or looking for a transition might see some potential for opportunities. Not everyone requires paid work. This information could inspire technology workers who are employed or retired to consider donating their time and knowledge as volunteers or directors of non-profit organizations that need guidance.

With the future work section 7, research organizations and survey designers looking at the non-profit sector might reconsider their target populations, recruitment processes, survey questions, or data analysis. Finally, anyone could continue with further research on the topic, taking into consideration some of the knowledge gaps presented and associated suggestions for future work.

9 Conclusion

Non-profit organizations provide vital services, and the demand for these services has been increasing. But the sector faces unique challenges.

Financially, NPOs rely on fundraising, donors, and large funders such as government entities. These funders often impose restrictions on how their money can be used. They want their money spent on the cause and not on overhead expenses and investments in technology.

In staffing, such financial restrictions make it harder to attract and retain qualified employees. Consequently, NPOs have few technology workers and rely heavily on volunteers. As a result, they tend to have higher than average turnover rates and insufficient resources to train their existing people.

Consequently, NPOs have technical challenges, like any other organization, but those challenges are exacerbated by the lack of technology workers and financial resources.

In this project, I outlined some NPO challenges and discussed some current approaches that organizations take to address them. I also described some difficulties associated with some of the approaches. I ended by pointing out some limitations in existing work that attempts to understand NPO technology challenges. The hope is that deeper understanding of the sector's unique challenges could help lead to more effective solutions, in turn help non-profit organizations increase their impact.

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1 Checking initial assumptions with interviews

1.1 Assumptions to validate

I have worked and volunteered with various non-profit organizations and, for some, had significant access to their existing technology and/or data. So, I checked some assumptions from my direct observations and experience.

1. Existing technology might be misunderstood, disorganized, and not integrated.
2. Data could be spread out and exist in different places and different formats.
3. An organization's "tech person" could often to be a hobbyist with a limited skill set.
4. Volunteer users likely have limited knowledge or experience using currently available technology.
5. Volunteers using internal data, such as a contact or donor database, are a security risk, either intentionally or unintentionally.
6. NPOs might be interested in new trends in technology, such as artificial intelligence, machine learning, and big data, but do not know where to start or consider it out of reach.
7. Organizations might be resistant to sharing information about their systems with outsiders due to security concerns. Which would make it hard to understand the current state of things.

1.2 Interviewees

- Elijah van der Giessen is the Community Manager for TechSoup, a non-profit organization that provides technology training and solutions to NPOs. He has been working to support NPOs in the Vancouver region for many years through hosting events, meetups, workshops, and conferences. He has also facilitated many presentations and discussions with people talking about NPO-related topics. Consequently, he has significant exposure to issues and challenges of a large variety of local organizations.

- Timothy Agg is the Executive Director of Board Voice, a non-profit organization that provides training and connection for directors of community services NPOs across British Columbia. Board Voice hosts an annual conference to bring together many of the members for discussions around common challenges and current issues. As the executive director, Tim is exposed to the challenges and concerns of many of the member organizations. He also has years of experience directly involved in other NPOs.

1.3 Learning from interviews

Limited financial resources

NPOs are generally underfunded. They might have sufficient funds (in the millions) tagged for service delivery (for those with funding contracts), but unallocated funds that can be used for administration costs, overhead, and IT investments can be very limited. Donors generally want their money to go towards the mission so allow limited amounts for administration costs and general expenses, including IT investments and maintenance.

Limited technical people

People involved with NPOs are generally mission-oriented and not necessarily the best qualified in terms of skill sets. In some organizations, a high percentage of the volunteers seem to be retired and perhaps involved for social connections. (Assumption 4 validated.) Turnover for both paid staff and volunteers tends to be high. Internal personnel dedicated to IT are uncommon because the cost cannot be justified, so the task often falls on the person with the most technical knowledge. (Assumption 3 validated.)

Patchwork solutions

With limited funds and inconsistent personnel, IT systems become undocumented patchworks of independent systems often inherited by people who do not fully understand them. Limited understanding of the technologies can also mean overspending on systems that might overlap in functionality and are not integrated with other systems. Overlap also means replication and unsynchronized common data such as contact information. (Assumption 1 validated.) Documents and information become spread across systems and can be difficult to find or use effectively, which is time-consuming and takes away from the organization's mission. (Assumption 2 validated.)

Resulting problems

Primary issues seem to be around the accessibility and usability of data and the use of hosted services rather than hardware or software resources. NPOs face some of the same challenges as for-profit enterprises but with less ability to mitigate issues through technology. Examples are contact management, marketing efforts, communications, and tracking people (employees or volunteers). Potential serious examples include required financial and organizational record-keeping, program documentation, and data security. Data access practices and internal security do not seem to be an issue because of clear policies and volunteer standards provided in government contracts and sector-specific regulations. (Assumption 5 busted.) NPOs do not seem to be expressing much interest at this point in topics such as AI, ML, or big data—they are not yet looking beyond basic IT needs. (Assumption 6 busted.)

Limited support

These organizations, especially smaller ones, need NPO-oriented consulting services, comprehensive IT strategies, and ongoing support and training in the language they understand. Finding such resources remains a challenge. In the meantime, technical advice comes from personal relationships or comparing notes with counterparts in other organizations. Organizations exist to help NPOs with areas other than technology, such as governance, board development, HR, fundraising, and grant proposals. Communities exist with some level of cooperation and sharing of ideas through memberships, conferences, and common interests.

Eager for solutions

NPOs face significant challenges related to technology and are frustrated because of their limited ability to do anything about it. They are eager for solutions but do not know where to go or who to ask for input or support. Consequently, many seek insight wherever they can find it. They share information with peers in other organizations and might ask questions of friends and relatives. Some organizations easily share details and access to their internal systems and data when help is available. (Assumption 7 busted.)