Canada's Nonprofit Tech Workforce

JULY 2024

CANADIAN CENTRE FOR NONPROFIT DIGITAL RESILIENCE

Acknowledgements

This project was conceived by the Canadian Centre for Nonprofit Digital Resilience. The Centre extends its appreciation to the following partners, individuals, and teams for their invaluable contributions to this work. For more information about the Canadian Centre for Nonprofit Digital Resilience, please visit www.ccndr.ca.

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A special thank you to Barbara Kuffour Asenso, Cathy Barr, Victor Beausoleil, Josh Berman, Lizz Bryce, Shyra Craig, Carlene Donnelly, Serah Gazali and the Women's Economic Council team, Jane Hilderman, Keith Jansa, Alberta Johnson, Sarah Juma, Alejandro Mayoral, Sandra Nkusi, Jason Shim, Alexandra Theroux, Pamela Uppal-Sandhu, Leena Yahia, and Spencer Gordon for their comments and feedback on this report.

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Funded by the Government of Canada's Skills for Success program. The opinions and interpretations in this publication are those of the authors and do not necessarily reflect those of the Government of Canada.

The Canadian Centre for Nonprofit Digital Resilience (CCNDR) works to create a digitally-enabled nonprofit sector, where Canada's nonprofits use data and tech to multiply their impact.

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Executive Summary

The nonprofit sector in Canada is currently undergoing dramatic changes, with the pressure to digitize mounting. Despite employing more than 2 million Canadians, the nonprofit sector faces an uphill struggle to keep pace with the increase in demand for digital skills—many nonprofits already report not having the necessary skills to use technology already in place. This problem will only grow as Canada continues to digitize.

In an effort to understand the current supply of digital skills within the nonprofit sector, this report analyzes Canadian census data to evaluate the size and composition of the tech workforce within the nonprofit sector. Using the approach developed by the Brookfield Institute for Innovation and Entrepreneurship in *Who Are Canada's Tech Workers* (2019), we identify tech workers based on the skills, activities, and knowledge areas required for their occupation.

By comparing the size and composition of the tech workforce both within and outside nonprofit institutions, we find:

1. **Nonprofits are light on tech work—they have one-fifth of the tech workers that other industries have.** While other industries have on average 5% of their workforce in tech occupations, less than 1% of workers in nonprofits are doing work that is classified as tech work.

2. **Tech workers in the nonprofit sector earn less.** Tech workers in nonprofits earn on average more than $30,000 less annually than tech workers in other industries. This means that tech workers are taking a pay cut of 33% by choosing to work in the nonprofit sector.

3. **Even job for job, tech workers doing the same work for nonprofits earn a lot less.** Hiring for tech skills in nonprofits relies heavily on workers willing to take large salary discounts. For example, information system specialists (the most common tech profession within nonprofits) earn 20% less working for nonprofits than they would working elsewhere.

4. **The nonprofit sector tends to be more diverse than other sectors when it comes to gender and Indigenous identity.** Visible minorities are overrepresented in all tech occupations, including tech work within nonprofits.

5. **However, Indigenous Peoples, women, and visible minorities are all paid less for tech work than other workers.** Women working in tech for nonprofits only earn 86% of what men working in tech for nonprofits earn and other marginalized groups are similarly underpaid for tech occupations within nonprofit organizations.

Futureproofing the Community Service Workforce

Unlocking the nonprofit sector's digital skills to strengthen community services

The nonprofit sector is the cornerstone of community services in Canada, delivering invaluable support to people in every region of the country. But as in most sectors, nonprofits are responding to rapid changes to digital technology. A digitally skilled nonprofit workforce is increasingly essential to successfully serve the evolving needs of communities.

However, there is **limited research** that assesses the current skills and future demands for the nonprofit workforce in Canada. What we do know is that there is a **growing gap** between the **digital skillsets and capacity** they have now and what they need to continue delivering services effectively.

In response, **Futureproofing the Community Service Workforce** aims to understand, and then unlock, the nonprofit workforce's facility with Digital Skills Plus (DS+). DS+ encompasses digital as well as adjacent skills often deployed with digital tools, including communication, creativity, innovation, adaptability and problem-solving skills. With funding from Employment and Social Development Canada (ESDC)'s Skills for Success program—and driven by a consortium of organizations with expertise in nonprofit capacity building and the digital skills economy—the 17-month project has four strategic **Phases**:

1. Understanding the current supply and future demand for DS+.
2. Analyzing the gaps in supply versus demand for DS+.
3. Co-designing and rapidly testing solutions to close this gap.
4. Creating a scalable DS+ talent model.

By the end of our project timeline, we hope to achieve the following **Objectives**:

- reinforce the evidence base in Canada on current and future needs for DS+ in the nonprofit sector, informing the sector's future training and talent strategies, increasing awareness of the forecasted demand for DS+ and enhancing the sector's ability to articulate and close the most pressing skill gaps;

- use this research to inform and test a prototype (or prototypes) of a scalable DS+ upskilling model that provides practical, tailored and broadly applicable training for the nonprofit workforce (in other words, to help them develop foundational and advanced digital competencies, fostering a culture of continuous learning and innovation); and

- mobilize findings and learnings via public reports, research briefs and recommendations to bring greater evidence-informed discussion to the nonprofit sector around its DS+ needs and paths forward.

Who We Are

Futureproofing the Community Service Workforce is led by a partnership between Imagine Canada, The Dais at Toronto Metropolitan University, the Digital Governance Council (DGC) and Blueprint. The Canadian Centre for Nonprofit Digital Resilience (CCNDR) provides a platform to share information about this project at https://futureproof.ccndr.ca/.

Introduction

The nonprofit sector is undergoing transformational change with the need to adopt new technologies at a rapid pace. With these technologies comes a need for new digital skills that support the successful implementation of new technologies and let nonprofits use those tools.

The nonprofit sector is a critical resource to communities across Canada and also acts as a major employer in Canada. According to Statistics Canada, 2.5 million Canadians were employed in the sector in 2021 including 618 thousand Canadians employed by community nonprofits.[1] Additionally, Statistics Canada estimates that nonprofits account for 8.3% of Canada's economy in 2021.

However, for nonprofit organizations, there is a significant gap in the skill sets needed for workers to succeed in an increasingly digital world. According to a survey conducted by the Nonprofit Technology Enterprise Network, many nonprofits say their staff are not skilled or trained to effectively use the necessary technology for their occupation.[2] They also identified that more than 25% of nonprofits are either only "functioning" (23%) when it comes to their technology capability or are "struggling" (6%). Similarly, a 2021 CanadaHelps survey found that a third of charities believe they will soon struggle to continue doing their work if they do not improve their digital capabilities.[3]

To date, there has been limited research into the state of the nonprofit sector within Canada. As part of the Skills for Success initiative, this report aims to understand one part of the conversation on digitization of the nonprofit sector, particularly as it relates to the landscape of information and communication technology (ICT) workers who work in the nonprofit sector. A companion study released alongside this report explores the state of digital skills required by all workers (ICT workers and non-ICT workers) in the nonprofit sector.

Starting with data from the O*NET database, we classify occupations based on their use of digital skills and knowledge. These occupations are then matched to the 2021 Canadian census allowing us to size the nonprofit tech workforce. We then decompose that workforce to understand its demographic characteristics and the salary disparities that exist within it.

Methodology

This research seeks to understand the current supply of digital skills within nonprofit organizations. To measure the existing supply of digital skills, we rely on data from the 2021 Census, accessed through the Toronto Region Statistics Canada Research Data Centre. To understand the current state of digital skills, we measure the current supply of tech workers within nonprofit institutions. In doing so, we must both operationally define tech work and the nonprofit sector.

Defining the nonprofit sector

In Canada, nonprofits comprise of three distinct categories: community nonprofit institutions, business nonprofit institutions, and government nonprofit institutions.[4] Community nonprofits are those that provide services for a minimal or no cost and receive the majority of their operating income from other sources, such as sponsorships, donations, or grants. Conversely, business nonprofits earn more of their revenue from their operating activities but are still limited in how they can produce and distribute any profits, many business industry associations fall into this category. Government nonprofits are more distinct, being heavily influenced by government action while the other classifications of nonprofits are generally independent, such as most hospitals and universities in Canada.

This research focuses on community and business nonprofit institutions, and in particular nonprofit institutions serving individuals when possible, in particular activities that have little to no cost for the end-user. While business nonprofits tend to have more fee-for-participation programming, many still deliver services at relatively low costs and so are included in the definition of nonprofits in this work.

We use an adapted version of the North American Industry Classification System (NAICS) codes based nonprofit classification used by the Ontario Nonprofit Network (ONN).[5] In addition to the definition used by the ONN, the NAICS code "7121 Heritage Institutes" was added. While this definition does not perfectly capture nonprofits, it captures the best portrait of service delivering nonprofits available.

Notably excluded from this definition are government nonprofits including hospitals, colleges, and universities, in line with the objectives discussed above.

This definition yields a total of 792,725 workers in the nonprofit sector, which is similar to the count of nonprofit workers derived from Statistics Canada's Annual Satellite Account of Nonprofit Institutions.[6] Statistics Canada suggests there are 2.4 million nonprofit workers in Canada, however, 1.63 million of those workers are in government nonprofit institutions. This leaves just under 800,000 workers in either business or community nonprofits.

Table 1: NAICS included in the nonprofit sector

NAICS	Description	Employment
6214	Outpatient care centres	133,665
6241	Individual and family services	234,665
6242	Community food and housing, emergency and other relief services	23,295
6243	Vocational rehabilitation services	16,165
6244	Child day care services	257,105
7121	Heritage institutions	33,950
8132	Grant making and giving services	31,140
8133	Social advocacy organizations	16,350
8134	Civil and social organizations	46,390

Defining tech work

The approach we use to measure tech work in Canada was first developed for Brookfield Institute's 2019 report *Who Are Canada's Tech Workers?* (2019). In that work, we conceptually identified that a worker should be called a tech worker if they are highly proficient in **at least one** out of the following **six** skills, knowledge, or work activities:

1. **Interacting with Computers:** Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.

2. **Computers and Electronics:** Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

3. **Programming:** Writing computer programs for various purposes.

4. **Technology Design:** Generating or adapting equipment and technology to serve user needs.

5. **Engineering and Technology:** Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.

6. **Telecommunications:** Knowledge of transmission, broadcasting, switching, control, and operation of telecommunications systems.

These correspond to the US Department of Labour's O*NET database, which tracks skills, knowledge, and work activities for occupations and assigns them scores based on the level of the skill and how important the skill is to the occupation. Level in this case refers to the level of complexity at which one is required to know the skill and is measured on a scale from 1–7 with unique anchor points for each skill. Importance of a skill to an occupation is measured uniformly on the same 5-point scale with 1 representing "Not at all important" and 5 representing "Very important". We must start from the O*Net database as the Canadian NOC has only recently started collecting detailed occupational attributes, and thus its suitability for research is yet to be fully understood.

Because these scales are ordinal and the level scales are not directly comparable across different skills, we do not rely on averages of the actual attributed values. Instead, we take the product of level and importance for a skill and rank all represented occupations on that combined metric. Combining these metrics this way is in line with recommendations from O*NET to incorporate the information from both scales.

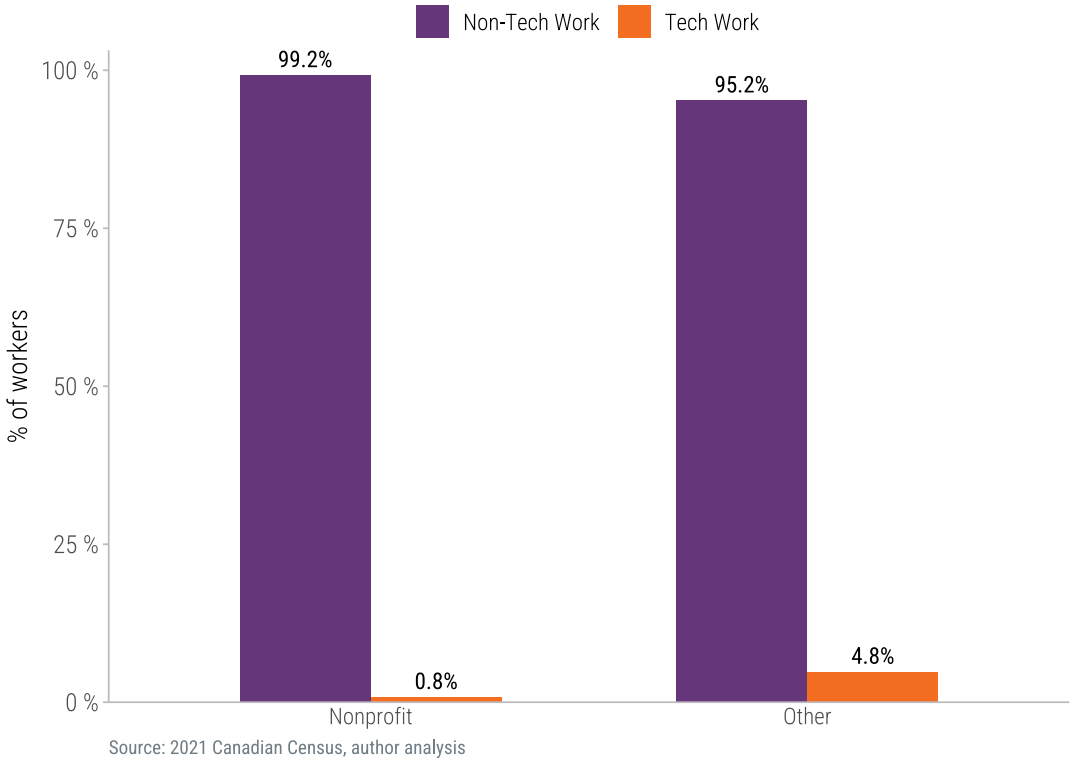
We then combine all six skills, work activities, and knowledges by taking the harmonic mean of their scores. Using harmonic means rather than geometric means results in occupations that score highly on any given metric qualifying as tech work, rather than penalizing them for having any specific activity scoring lowly.

This leaves a single numeric score attached to every occupation. Consistent with the approach taken in *Who Are Canada's Tech Workers?* (2019), we classify the top 5% of jobs on this metric as tech work.

Census of Nonprofit Tech Workers

Applying our definition of tech work to the identified nonprofit sector, we find 6,515 tech workers in nonprofits in Canada. This represents less than 1% of the overall nonprofit workforce. Comparatively, nearly 5% of workers outside the nonprofit sector are classified as tech workers. Inversely, when looking at all tech workers in Canada, only 0.7% are actually working in nonprofit institutions; there are nearly a million tech workers outside of nonprofits.

Figure 1: Tech work participation in Canada, 2021



Source: 2021 Canadian Census, author analysis

The nature of techwork in nonprofits is similar to that in other industries. Table 2 shows the most common jobs for tech workers in nonprofits compared to the most common jobs for other tech workers. In both cases the list of

roles is fairly similar with 8 of the top 10 most common positions overlapping between sectors. The two nonprofit jobs that are in the top ten but not in the top ten of other businesses are database analysts and web designers, while in other industries mechanical and electrical engineers are more common.

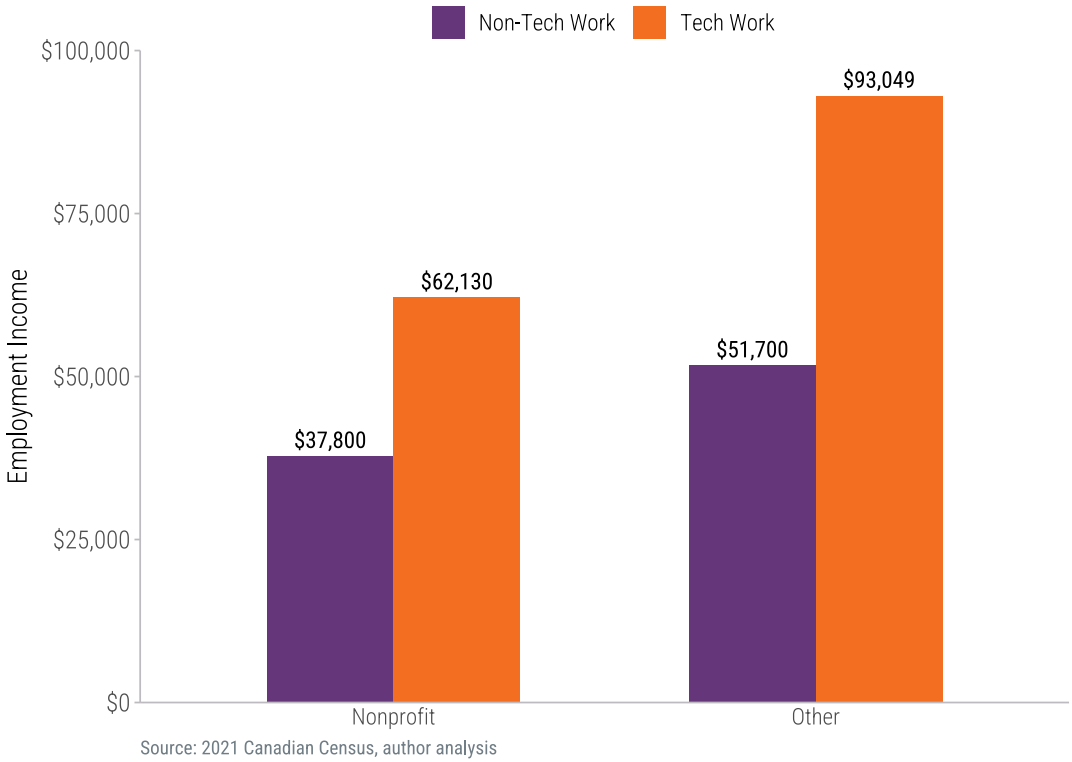
The relatively small tech workforce in the nonprofit sector is likely a combination of lower demand and lower ability to attract tech work. The nature of community service nonprofits might be such that there is a lower demand for digital skills than in other industries. However, as discussed above, many nonprofit organizations are concerned both about their current ability to use digital technologies, and also their ability to keep up with future digitizations. This suggests that at least in part the lower supply of digital skills is caused by a difficulty attracting technology workers. One potential explanation for this—differences in compensation between nonprofits and other organizations—is discussed in detail below.

Table 2: Most common tech occupations within nonprofits and other organizations

	Nonprofits		Other businesses
NOC	Description	NOC	Description
21222	Information systems specialists	21222	Information systems specialists
22220	Computer network and web technicians	21232	Software developers and programmers
20012	Computer and information systems managers	21231	Software engineers and designers
21223	Database analysts and data administrators	20012	Computer and information systems managers
21234	Web developers and programmers	22220	Computer network and web technicians
11101	Financial and investment analysts	21301	Mechanical engineers
21232	Software developers and programmers	11101	Financial and investment analysts
21230	Computer systems developers and programmers	21234	Web developers and programmers
21233	Web designers	21310	Electrical and electronics engineer
21231	Software engineers and designers	21230	Computer systems developers and programmers

Salaries

Figure 2: Income for tech and non tech workers, 2021



Source: 2021 Canadian Census, author analysis

When comparing the salaries of nonprofit tech workers to those outside the nonprofit sector, it's important to take as a baseline the overall differences between nonprofit and other sector salaries—those working for nonprofits on average earn significantly less than those working outside the nonprofit sector.

Looking at non-tech workers, Figure 2 shows that the average income for those in other sectors is $51,700 compared to $37,800 for nonprofits. This represents a wage cost of 27% for those who choose to work in nonprofits, or $13,900 in salary. Comparatively, for tech workers in other businesses, the average salary is $93,049 and $62,130 for nonprofit tech workers. This is both a higher wage premium as a percentage and in real dollars: nonprofit tech workers earn 33% less, equivalent to $30,919.

Occupational salaries

Table 3: Salary comparison for the most common tech occupations between nonprofit and other organizations

Occupation	Non-Profit Salary	Other Business Salary	Difference ($)	Difference (%)
Computer network and web technicians	$56,758	$66,154	-$9,396	-14%
Information systems specialists	$66,759	$83,338	-$16,579	-20%
Web developers and programmers	$47,835	$60,969	-$13,134	-22%
Software engineers and designers	$76,652	$107,480	-$30,828	-29%
Database analysts and data administrators	$53,022	$75,492	-$22,470	-30%
Computer and information systems managers	$89,954	$130,057	-$40,103	-31%
Software developers and programmers	$59,964	$86,697	-$26,733	-31%
Computer systems developers and programmers	$45,273	$76,569	-$31,296	-41%
Web designers	$24,042	$41,261	-$17,219	-42%
Financial and investment analysts	$60,500	$140,117	-$79,617	-57%

The salary comparison does not improve when we compare specific occupations within and outside the nonprofit sector. Table 3 shows the difference in salaries for the most common tech work positions in the nonprofit sector. In nearly every case, those who choose to work in the nonprofit sector earn at least $13,000 less than they could outside the sector. This is likely an underestimate of the true income gap between nonprofits and other sectors; tech salaries often include significant non-wage compensation in the form of benefits like equity that would be significantly higher in for-profit private enterprises versus the nonprofit sector.[7] The only exception is for network and web technicians who only earn 14% less in the nonprofit sector although this is still a significantly lower income. These differences remain significant even when accounting for differences in hours worked (and so differences between part-time and full-time employment across sectors).

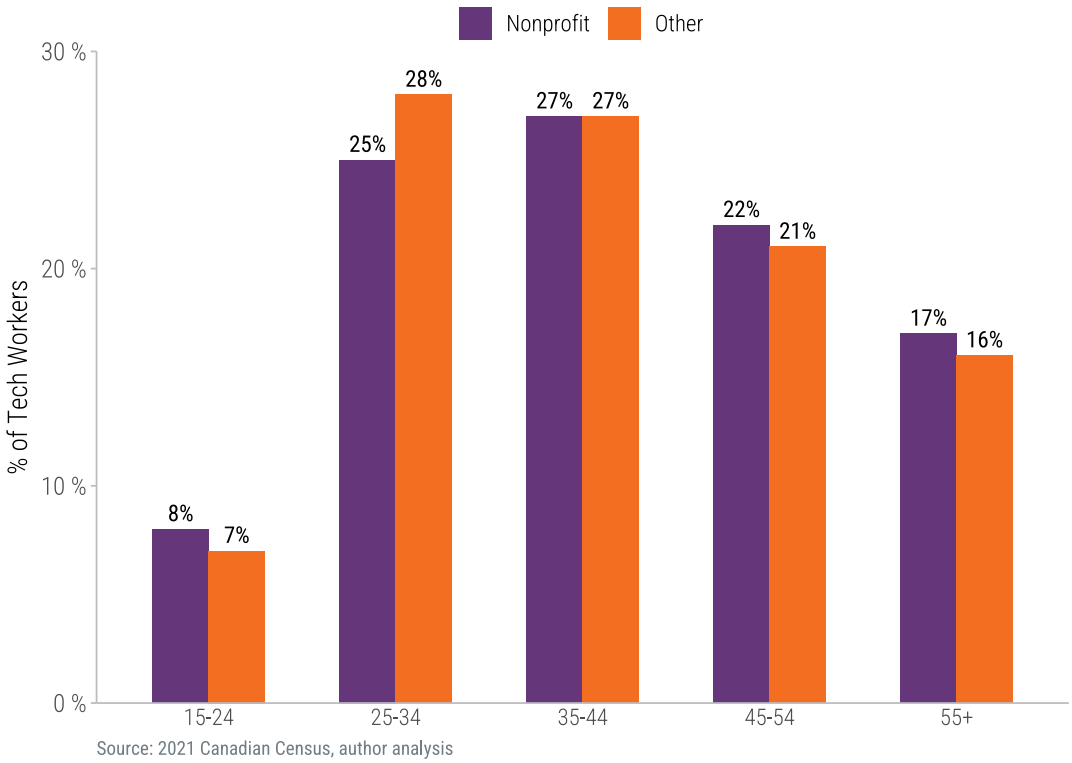
This suggests that those choosing to work for nonprofits are knowingly taking lower wages than they could earn elsewhere. Indeed, the literature suggests that those working for nonprofit institutions are often motivated by the mission rather than wages.[8] However, the wage cost for tech workers is higher both as a fraction and in real dollars. This means that for tech workers, will need to value the mission more highly than other workers. While to date this may not have prevented nonprofit institutions from recruiting the tech talent they need, as Canada continues to digitize and the demand for digital skills grows, the nonprofit sector may find it struggles to attract talent away from other industries where the same workers could earn significantly more.

Finally, a big elephant in the room is the funding structure of nonprofit organizations that largely rely on government and foundation grants, as well as donations from private individuals. There has also been a historical focus on the idea of "cost-efficiency" in nonprofit performance evaluation, where success has been viewed singularly through the lens of a high percentage of funding going directly into program delivery, as opposed to "operation" of the nonprofit, creating a stigma against high pay.[9] Specific funding opportunities also restrict the amount that can be used to fund operational or "overhead" expenses, making organizations unable to invest in IT talent and infrastructure, which are considered to be non-program expenses. While there are some signs that this is changing, this further limits the ability of nonprofits to divert limited funding available to them to be able to offer competitive salaries against the private sector. In sum, the lower pay for tech workers in the sector may not reflect the sector's lack of demand for the workers; in fact, there are reasons to believe that the low pay is more due to funding and operational constraints that prevent nonprofits from being able to offer competitive salaries.

Demographics of Tech Workers

Age

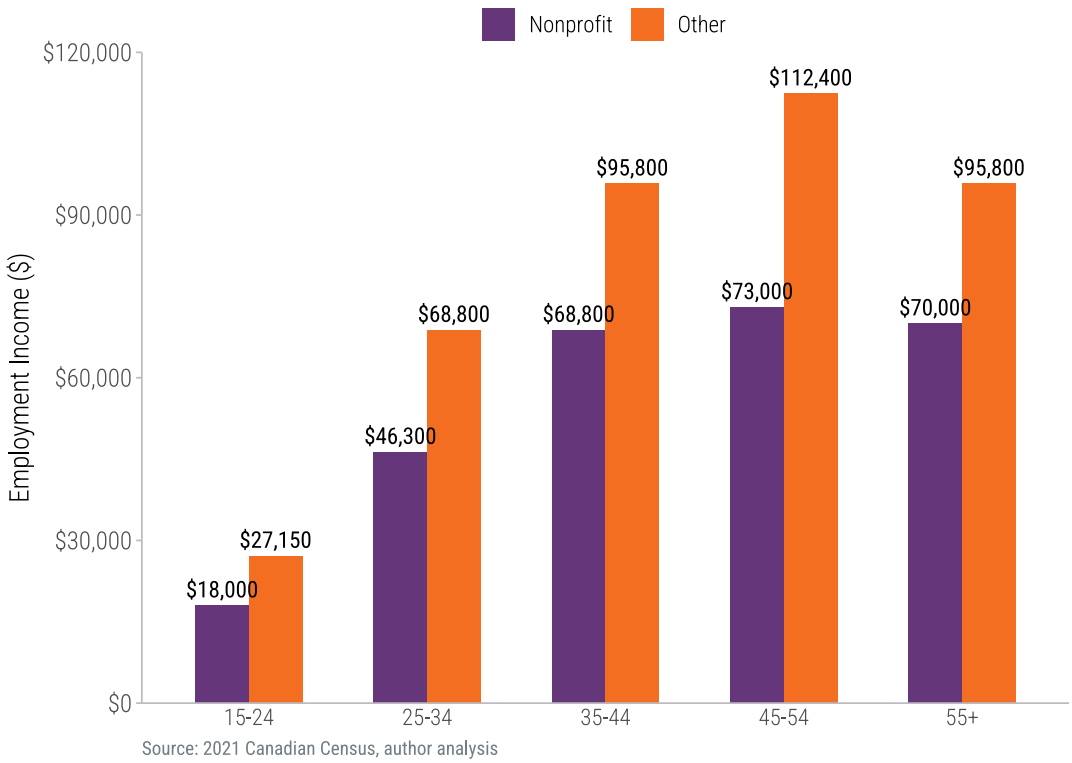
Figure 3: Age composition of tech workers, 2021



Source: 2021 Canadian Census, author analysis

Outside of the nonprofit sector, Figure 3 shows that tech work is distributed across workers of all ages largely evenly, with the exception of those 24 and under, and those over 55 where the participation in tech work is notably lower. Within the nonprofit sector, participation in tech work is also lower in those age groups, although the difference is less stark. In part due to the size of the groups, this leaves those 25-34 and 35-44 as the largest groups of tech workers in nonprofits.

Figure 4: Tech worker income by age group, 2021

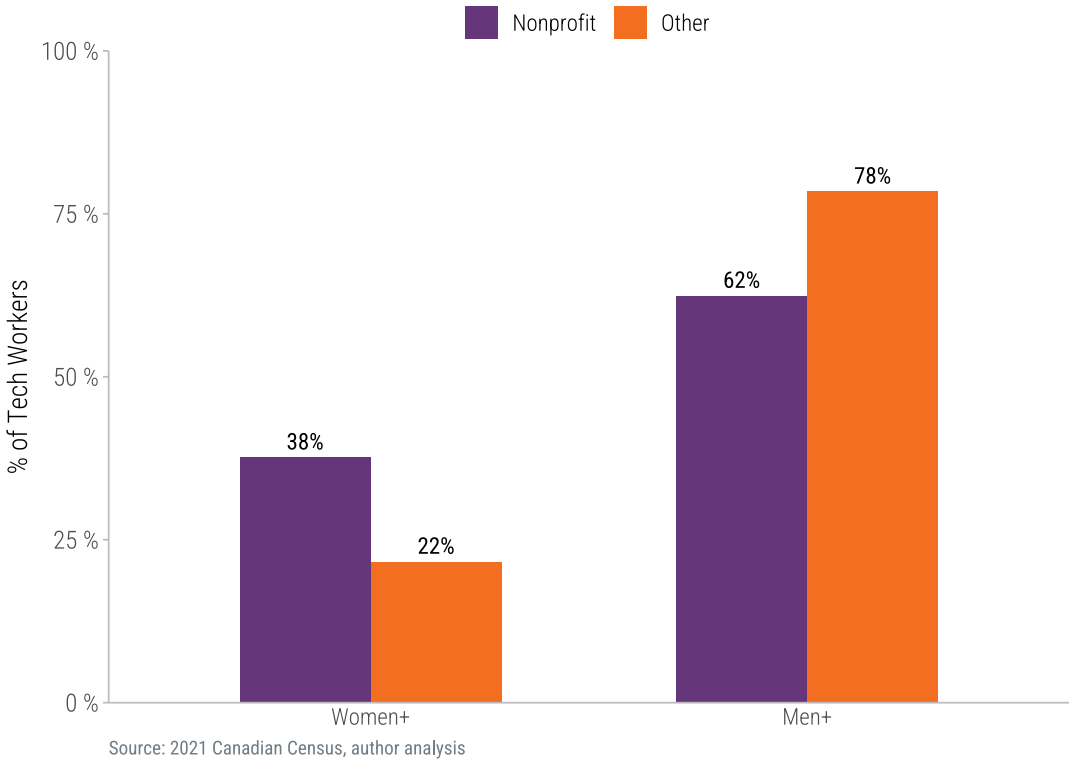


Source: 2021 Canadian Census, author analysis

In Figure 4, we see that salaries for tech work are highest among those 45-54—a pattern that is consistent both within and outside the nonprofit sector. However, in the nonprofit sector, there is a much smaller decline in salaries for those 55+. Outside of the nonprofit sector, those 55+ are on average earning nearly $17,000 less than those 45-54. The comparable dropoff within nonprofits for older tech workers is only $3,000, lower in both absolute and relative terms. It is also noteworthy that employment income for workers seems to level off for workers 35 years or older, while in the private sector, significant and further wage growth is expected as workers gain more experience. This likely highlights the sector's challenge in attracting and retaining highly capable executive and management talent, given the limited wage growth potential for highly experienced workers.

Gender

Figure 5: Gender composition of tech workers, 2021



Source: 2021 Canadian Census, author analysis

The gender[10] composition of the tech workforce in nonprofits and in other businesses shows the same imbalance, but the severity of that gap is much smaller within nonprofits. Figure 5 shows that outside of nonprofits, only 1-in-5 tech workers are women (21.6%) while nearly 80% are men. Within the nonprofit sector, this figure is 38% of tech workers are women while 62% are men. There is still a significant gender imbalance, but it is far smaller than other industries.

This is likely due to an overall gender imbalance in the nonprofit sector—as our data shows that women make up more than 80% of the nonprofit sector workforce. This means that within the nonprofit sector, there is a massive gender gap in the participation rate of tech work—2.8% of men in the nonprofit sector are in tech work while only 0.3% of women in the nonprofit sector are tech workers. That means that a man in the nonprofit sector is nearly 10 times as likely to be a tech worker than a woman in the nonprofit sector. Comparatively, outside of the nonprofit sector, a man is only 3 times more likely to be employed in tech work than a woman.

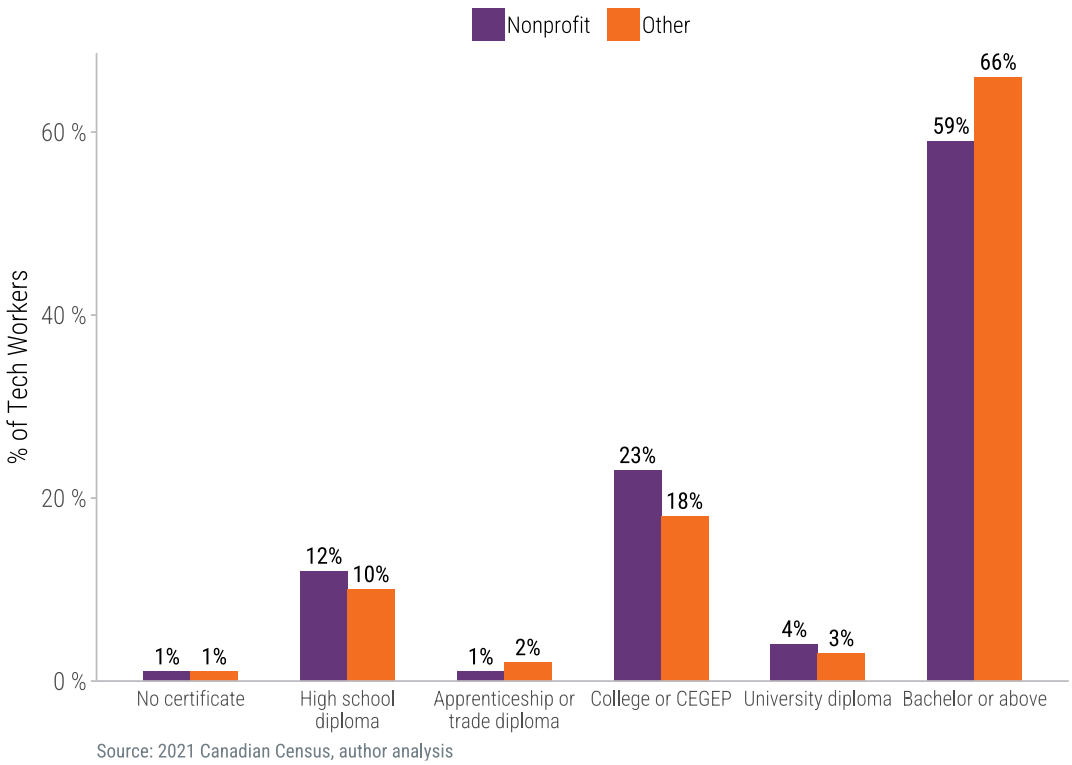
Both men and women tech workers take salary cuts to be employed in the tech sector, however, because women tech workers earn less than men who are

tech workers across the entire economy, within the nonprofit sector women engaged in tech work earn less than men doing the same work. Women in nonprofits doing tech work on average earn only 86% of what men doing tech work in nonprofits earn. It is important to note that this pay gap is larger in the private sector than in the nonprofit sector.

It is worth noting at this point, that one reason for lower tech worker pay in the sector can partly be attributed to a phenomenon of "feminization" of the nonprofit sector, or societal perceptions of the type of work that the nonprofit sector engages in, and how such work is associated with traditionally gendered care work, leading to such work being devalued. This has often meant that work that is more commonly associated with traditional women stereotypes is not as financially valued.[11] There are secondary effects to consider here that help ameliorate some of these effects, as nonprofit sectors, having a higher representation of women, are also more likely to provide non-financial benefits that are specifically beneficial to women (partly due to the disproportionate burden that is still placed on women with regards to childcare).[12]

Education

Figure 6: Educational composition of tech workers, 2021



Source: 2021 Canadian Census, author analysis

Both within and outside of the nonprofit sector, the requirement to enter tech work is typically a bachelor's degree. Figure 6 shows that the majority of tech workers have at least a bachelor's degree. That said, in nonprofits the level of education for tech workers is more likely to be lower. Within nonprofit organizations, nearly 1-in-4 (23%) of tech workers have at most a college or CEGEP education—higher than the 18% with that level of education among other tech workers. Similarly, 12% of nonprofit tech workers have at most a high school diploma compared to only 10% of tech workers outside of nonprofits.

Across all levels of education, participation in tech work is significantly lower within nonprofit organizations than outside them. For those with bachelor's degrees, outside of nonprofits, more than 10% are engaged in tech work while only 1% of bachelor's degree holders within nonprofits are doing any kind of tech work.

Figure 7: Tech worker income by educational attainment, 2021

Source: 2021 Canadian Census, author analysis

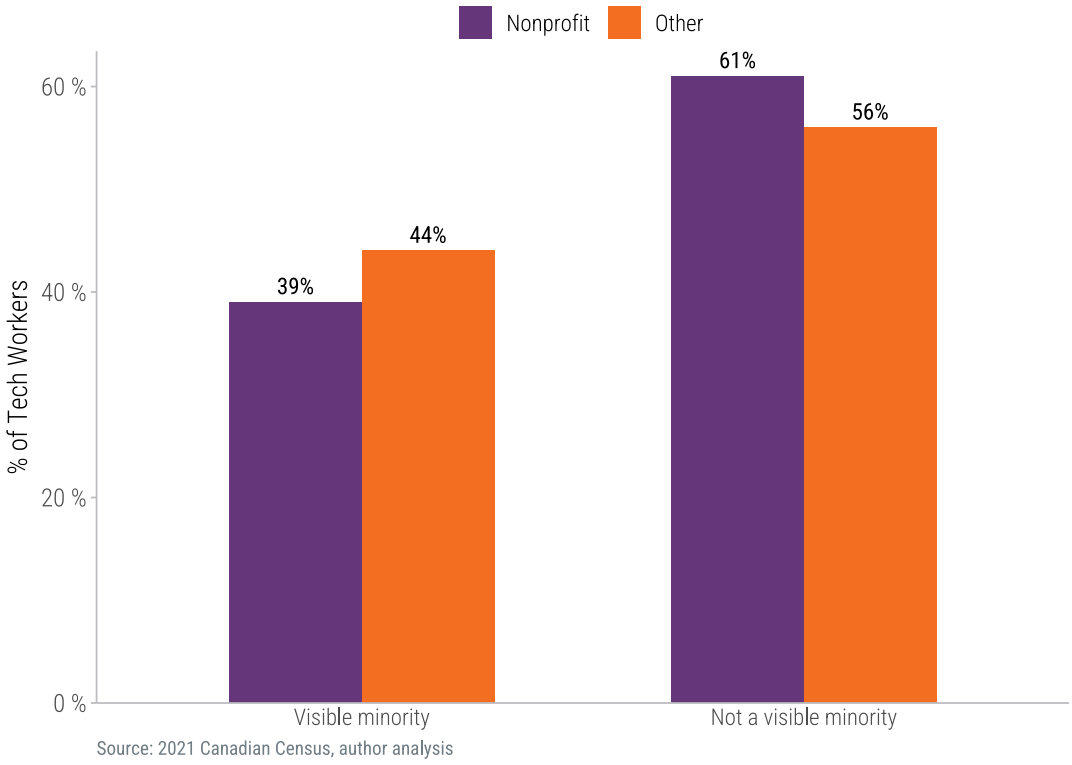
As continues to be the case, in Figure 7 we see that tech workers pay a significant cost in lost income to work in nonprofits, regardless of their level of education. For tech workers with bachelor's degrees (which are the majority

of all tech workers), this premium is more than $30,000 on average—if they choose to work outside nonprofits they can expect their salary to be nearly 50% higher than if they work for a nonprofit. For tech workers with either no certificate or only a high school diploma, this gap shrinks significantly but those outside of nonprofits earn more regardless.

Overall, this salary discrepancy combined with the salary differences observed within age groupings suggests that the difference between the nonprofit sector and other industries cannot be attributed to a lower barrier to entry. If tech work in the nonprofit sector tended to be done by more junior, less educated workers we might expect that to explain the difference in overall salaries. While the tech workforce in nonprofits is generally less highly credentialed, within any given level of education there are significant differences in salary.

Visible Minority

Figure 8: Visible minority identities of tech workers, 2021

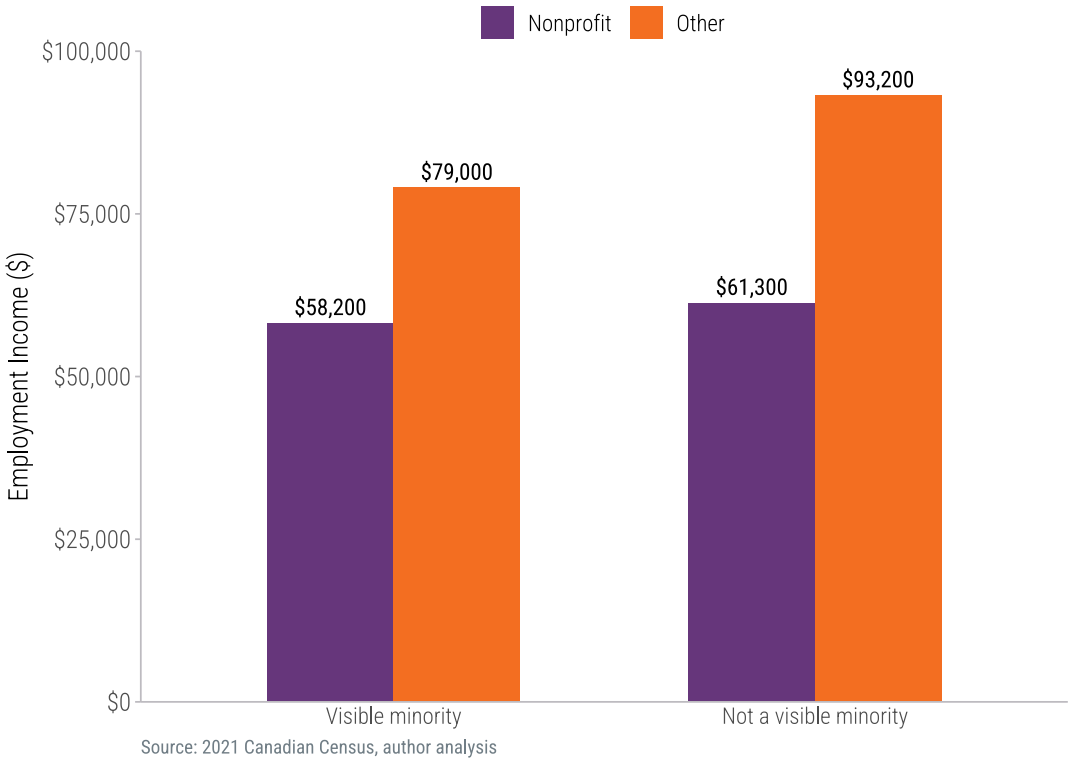


Source: 2021 Canadian Census, author analysis

In Figure 8, we see that nonprofit tech workers are less likely to be a part of a visible minority than tech workers outside of nonprofits. In other industries, 44% of all tech workers are members of a visible minority. Within nonprofit organizations, this is only 39%. However, in both cases, members of visible minorities are still overrepresented in tech occupations. The participation rate

in tech work is higher for members of visible minorities regardless of whether they are in the nonprofit sector or not.

Figure 9: Tech worker income by visible minority identities 2021

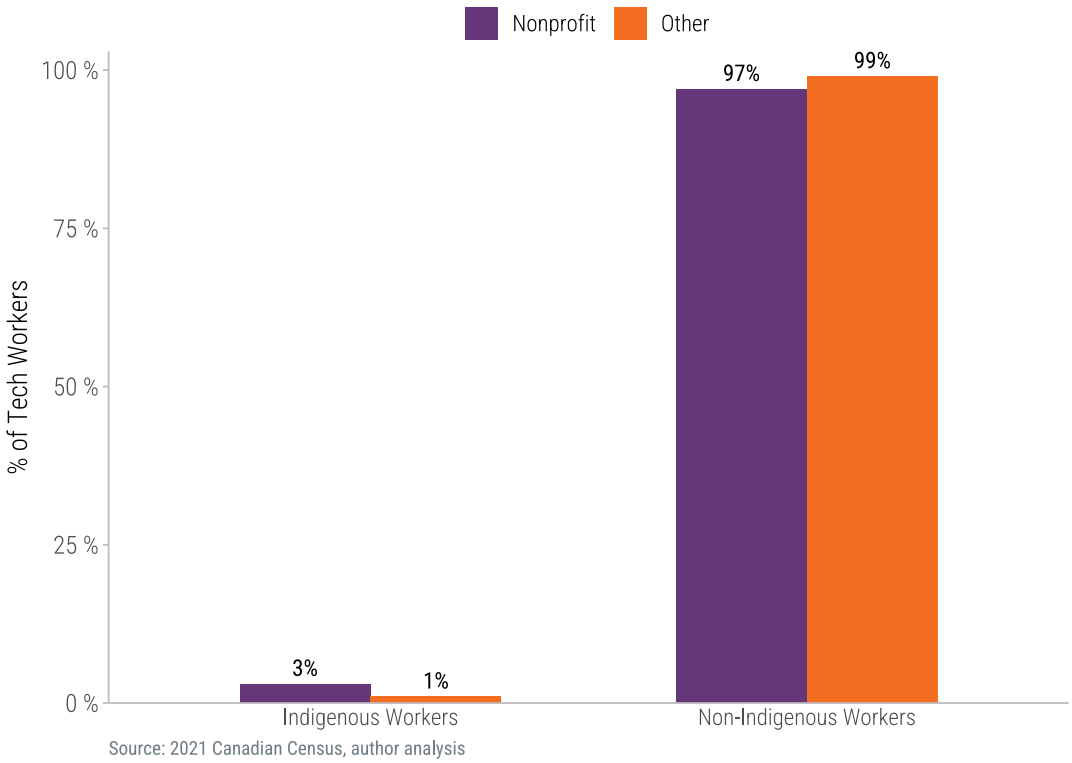


Source: 2021 Canadian Census, author analysis

For workers with visible minority identities who do end up working in tech occupations, figure 9 shows that they tend to earn less than their counterparts who are not visible minorities. Within nonprofits, there is a $3,000 income disparity between visible minority tech workers and other tech workers. This is significantly smaller than the disparity outside of nonprofits where members of visible minorities working in tech make more than $14,000 less.

Indigenous Tech Worker

Figure 10: Indigenous identities of tech workers, 2021

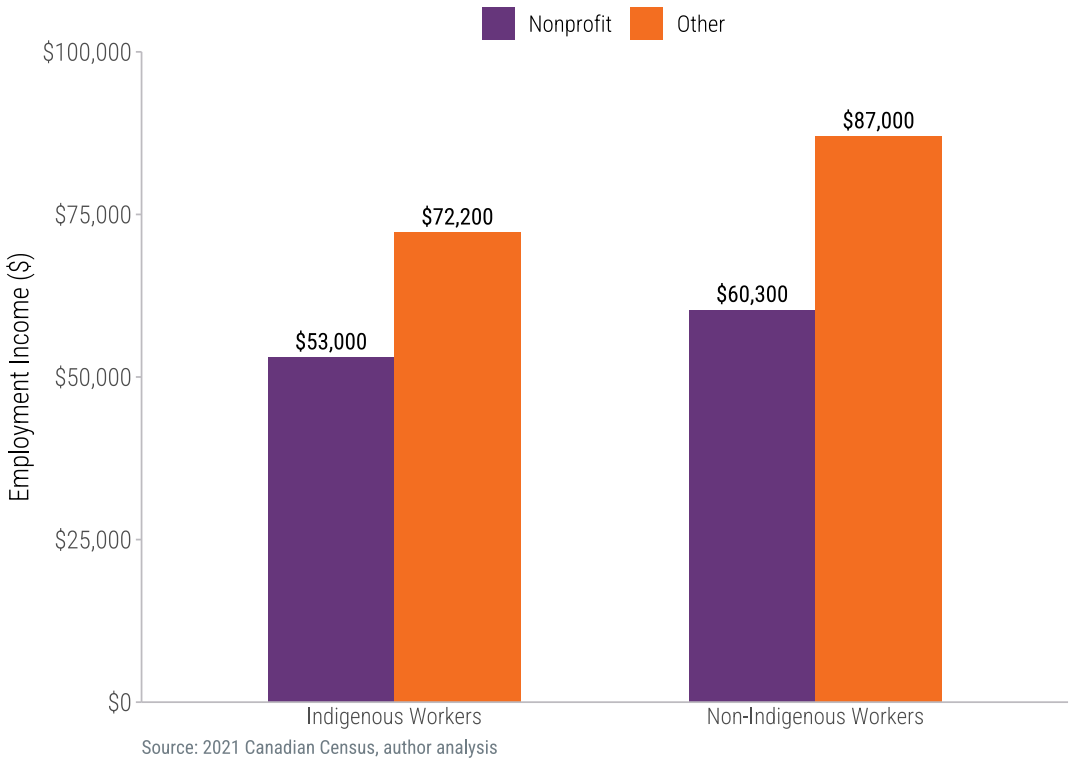


Source: 2021 Canadian Census, author analysis

Both within and outside nonprofits, Indigenous Peoples only make up a small share of tech workers—figure 10 shows that only 3% of tech workers at nonprofits identify as Indigenous.

Indigenous Peoples are more likely to be working for nonprofits than others in Canada—this results in Indigenous Peoples having a larger share of tech workers within nonprofits without the participation rate in tech work being any better for Indigenous Peoples in Canada within nonprofits. Across the economy, Indigenous peoples are far less likely to be engaged in tech work than others in Canada.

Figure 11: Tech worker income by Indigenous identities, 2021



Source: 2021 Canadian Census, author analysis

There is also a persistent wage gap for Indigenous Peoples in Canada engaged in tech work. Figure 11 confirmed that within nonprofit organizations, Indigenous workers earn more than $7,000 less than other workers engaged in tech work on average.

In conjunction with the above findings on the income of visible minorities and women in nonprofit tech work, this paints a nuanced picture: while the sector has had success in increasing diversity within its workforce, there are still large hurdles to overcome to achieve equity in nonprofits. For example, Indigenous Peoples who work in nonprofits are earning less both because of their Indigenous identity and because they choose to work in a nonprofit. This is an important problem for the sector to tackle as it moves forward.

Conclusion

The nonprofit sector faces significant challenges developing tech talent. As it currently stands, nonprofit organizations have far fewer tech workers than other industries and those who are engaged in tech work are giving up substantial potential income to remain at nonprofits. While nonprofits continue to rely on workers willing to take a cut to their income to work for a cause they support, this price is significantly higher for tech workers than for other workers.

There is already a shortage of digital skills within the nonprofit sector, but it does not stop there. With the continued digitization of Canada's economy, nonprofits will face continued pressure to increase their digital skills and tech workforce. As the demand for tech workers in nonprofits grows, it will be difficult to keep pace by relying on attracting talent from other sectors due to the significantly lower salaries offered by nonprofits.

Additionally, within the nonprofit sector, there are clear salary disparities with women, visible minorities, and Indigenous tech workers earning significantly less than white men. However, this is not an issue that is inherent to tech work within the nonprofit sector. It suggests a need for foundational change across nonprofit institutions to ensure that workers are treated fairly regardless of gender, visible minority, and identity.

In driving change, the singular focus for the sector should be on how they can competitively hire for, and retain tech talent (particularly against the private sector). Advocating for large consequential funders to allow funds granted through such organizations to be used in important operational expenses that support organizational infrastructure to support across-the-board program delivery is a start. However, given political realities, no single organization is likely to be able to make such a case successfully. We have seen recent welcome signs of nonprofit organizations working together, through organizations such as the Canadian Centre for Nonprofit Digital Resiliency which supports and advocates for the entire nonprofit sector.

APPENDIX A:

Technical Matter

Methodology for defining the tech sector

In this appendix, we detail the full methodology we employed. Following the approach of *Who Are Canada's Tech Workers*, we identify tech occupations based on the skills that make up a tech occupation.

To identify occupations that require digital skills in Canada (tech occupations), we rely on the United States Department of Labour's Occupational Information Network (O*NET) database. This database contains information on 923 distinct occupations on different aspects of the jobs. This work relies on information relating to occupational skills, knowledges, and work activities (SKWs). This data is collected from either job incumbents or occupational experts and is updated periodically to remain accurate.

To select the SKWs relevant to digital skills, we apply two principles (drawn directly from *Who Are Canada's Tech Workers*):

1. The skills, knowledge, and work activity must relate directly to technology use or technology creation.

2. If an occupation has a strong requirement for any of the previously identified tech skills, it will qualify as a tech occupation.

The first principle relates directly to the decision of which SKWs to include in the analysis, while the second provides direction on how to aggregate the included SKWs. This second principle is discussed in more detail below.

Using these principles, we identified six SKWs that are tracked within O*NET that constitute tech skills:

1. **Interacting with Computers:** Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.

2. **Computers and Electronics:** Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

3. **Programming:** Writing computer programs for various purposes.

4. **Technology Design:** Generating or adapting equipment and technology to serve user needs.

5. **Engineering and Technology:** Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.

6. **Telecommunications:** Knowledge of transmission, broadcasting, switching, control, and operation of telecommunications systems.

For each of these SKWs, O*NET tracks two distinct measures: level and importance. Level refers to the level at which one is required to know the SKW—higher levels will require more complex knowledge of the SKW. Conversely, importance refers to how vital a given SKW is to an occupation—while an occupation can be required to perform a task at a high level of complexity, that knowledge may not be used frequently in the occupation.

Both level and importance are measured using ordinal scales (for level, the scale ranges from 1 to 7, while for importance the scale ranges from 1 to 5). In both cases, a higher score indicates either a higher level of importance or level of complexity. However, as the scales are ordinal rather than linear, we cannot compare changes directly. For example, an increase of importance from 1 to 2 does not necessarily reflect a doubling of importance, and it is also not necessarily the same as an increase from 2 to 3 or 3 to 4.

Additionally, each SKW is scored using a unique set of levels—specific anchors are given for different values and these anchors are not comparable across SKWs. For example, a 3 for level for "Mathematics" is not necessarily the same as a 3 for "Programming" and so these are not directly comparable.

To solve for this, we focus on the ordinal scale within each SKW (whether one number is larger than another) rather than the cardinal scale (by how much one number is larger than another).

As a result, we rank all occupations within each of the SKWs listed above, then aggregate the resulting six rankings into one composite measure. This is done by multiplying importance and level together and taking the harmonic mean of the results.

Combining the two measures for each SKW is O*NET's recommended way of using them, as it incorporates both the complexity and the importance of a particular SKW to an occupation. While O*NET also recommends normalizing the two scales before combining them, as the two measures have different ranges, we do not do that here as we are not interested in cardinal measures. Instead, after multiplying the raw scores, we use them to rank each occupation for each of the six tech skills we selected.

We then use the harmonic mean to aggregate all six SKW scores together. A harmonic mean is defined as the reciprocal to the arithmetic mean of the reciprocals of the inputs:

$$\text{For } x_i, i \in \{1,2,\ldots n\},$$

$$x_H = n \frac{1}{\sum_{i=1}^{n} \frac{1}{x_i}}$$

This has distinct benefits over traditional (arithmetic) means or geometric means. Harmonic means reward highly scoring occupations on any SKWs, while not penalize an occupation for ranking lowly on a different SKW. This follows the second principle outlined above, stating that as long as an occupation relies heavily on any one tech SKW it should be a tech occupation.

To convert this American data and match it to Canadian data, we manually connect O*NET occupations to Canadian National Occupational Categories (NOCs) using the 5-digit level for NOCs. There are 510 NOCs at this level of specificity. While previous work has compared O*NET occupations to 4-digit NOC occupations, recent updates to the NOC methodology mean that current 5-digit NOCs are most comparable to O*NET occupations.

Tech occupations identified

Using the methodology for ranking tech work above, we identified the most digitally intensive occupations in Canada. Consistent with the methodology from *Who are Canada's Tech Workers*, occupations in the 95th percentile and above are classified as tech occupations. Those occupations are listed below:

Aerospace engineers	Information systems specialists
Broadcast technicians	Information systems testing technicians
Chemical engineers	Mechanical engineers
Computer and information systems managers	Metallurgical and materials engineers
Computer engineers (except software engineers and designers)	Mining engineers
Computer network and web technicians	Other professional engineers
Computer systems developers and programmers	Other professional occupations in physical sciences
Cybersecurity specialists	Physicists and astronomers
Data scientists	Software developers and programmers
Database analysts and data administrators	Software engineers and designers
Electrical and electronics engineers	Telecommunication carriers managers
Financial and investment analysts	Telecommunications equipment installation and cable television service technicians
Geological engineers	Telecommunications line and cable installers and repairers
Industrial designers	Web designers
Industrial engineering and manufacturing technologists and technicians	Web developers and programmers

APPENDIX B:

Detailed Demographic Information

Table A.1

Sector	Age	Non-Tech Workers	Non-Tech Mean Income	Non-Tech Median Income	Tech Workers	Tech Mean Income	Tech Median Income	Tech Partici-pation Rate	% of workforce
Nonprofit	15-24	89,815	$ 13,920	$ 9,300	535	$ 18,000	$ 12,000	0.47%	8%
	25-34	183,460	$ 32,700	$ 29,150	1,645	$ 46,300	$ 49,900	0.67%	25%
	35-44	181,870	$ 40,000	$ 35,300	1,750	$ 68,800	$ 67,800	0.68%	27%
	45-54	160,045	$ 45,000	$ 39,700	1,455	$ 73,000	$ 73,400	0.59%	22%
	55+	178,765	$ 36,300	$ 27,650	1,135	$ 70,000	$ 71,200	0.47%	17%
Other Organizations	15-24	2,622,570	$ 14,400	$ 9,360	62,000	$ 27,150	$ 19,800	2.29%	7%
	25-34	3,645,035	$ 42,100	$ 35,800	255,150	$ 68,800	$ 64,600	6.41%	28%
	35-44	3,569,690	$ 57,600	$ 47,300	245,075	$ 95,800	$ 85,600	6.25%	27%
	45-54	3,387,810	$ 64,600	$ 50,100	189,290	$ 112,400	$ 94,800	5.13%	21%
	55+	4,441,415	$ 49,800	$ 34,000	144,390	$ 95,800	$ 84,800	3.09%	16%

Table A.2

Sector	Education	Non-Tech Workers	Non-Tech Mean Income	Non-Tech Median Income	Tech Workers	Tech Mean Income	Tech Median Income	Partici-pation Rate	% of workforce
Nonprofit	No certificate	47,655	$17,040	$8,920	35	$60,000	$70,000	0.05%	1%
	High school diploma	140,600	$22,440	$14,760	775	$42,800	$41,800	0.43%	12%
	Apprentice-ship or trade diploma	44,320	$26,950	$23,120	75	$44,000	$52,000	0.08%	1%
	College or CEGEP	232,250	$33,000	$30,600	1,480	$59,100	$64,200	0.50%	23%
	University diploma	35,530	$36,900	$33,100	280	$58,000	$57,000	0.26%	4%
	Bachelor or above	293,600	$48,000	$42,300	3,870	$64,400	$63,300	1.00%	59%
Other Organi-zations	No certificate	1,928,590	$26,250	$15,040	4,690	$64,600	$50,200	0.24%	1%
	High school diploma	4,774,610	$34,400	$24,200	86,185	$58,700	$47,400	1.75%	10%
	Apprentice-ship or trade diploma	1,776,775	$48,100	$41,100	20,445	$61,500	$56,900	1.08%	2%
	College or CEGEP	3,570,715	$46,500	$38,500	161,105	$74,800	$71,000	4.22%	18%
	University diploma	522,640	$46,800	$36,300	28,820	$74,800	$69,800	4.54%	3%
	Bachelor or above	5,093,190	$67,800	$50,400	594,655	$95,800	$82,800	10.24%	66%

Table A.3

Sector	Visible Minority	Non-Tech Workers	Non-Tech Mean Income	Non-Tech Median Income	Tech Workers	Tech Mean Income	Tech Median Income	Participation Rate	% of tech workforce
Nonprofit	Not a visible minority	540,260	$37,100	$30,400	3,945	$61,300	$62,500	0.64%	61%
	Visible minority	253,695	$32,300	$25,850	2,570	$58,200	$59,600	0.82%	39%
Other Organizations	Not a visible minority	12,269,000	$51,100	$37,600	498,130	$93,200	$79,000	3.87%	56%
	Visible minority	5,397,515	$38,800	$27,200	397,780	$79,000	$72,000	6.79%	44%

Table A.4

Sector	Indigenous Identity	Non-Tech Workers	Non-Tech Mean Income	Non-Tech Median Income	Tech Workers	Tech Mean Income	Tech Median Income	Participation Rate	% of workforce
Nonprofit	Other Canadians	735,630	$35,600	$28,950	6,325	$60,300	$61,200	0.78%	97%
	Indigenous	58,330	$34,200	$28,900	190	$53,000	$59,000	0.16%	3%
Other Organizations	Other Canadians	16,969,320	$47,700	$34,500	885,285	$87,000	$76,200	4.94%	99%
	Indigenous	697,195	$39,600	$27,100	10,620	$72,200	$64,600	1.37%	1%

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