

Intersections and Innovations

Change for Canada's Voluntary and Nonprofit Sector



The Muttart Foundation



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Acknowledgements

For far too long, Canada has lacked a comprehensive resource examining Canada's charitable sector. That has now ended.

The Muttart Foundation has spent many years focusing on building the capacity of charities in this country. The publication of this collection is another contribution to that effort. By understanding more about itself, the sector can continue to develop and find new ways to serve Canadians and those in need outside our nation.

The authors of these essays bring different perspectives on the role and inner workings of Canada's charities. Collectively, they bring an unprecedented insight into the work of organizations whose diversity is exceeded only by their desire to serve.

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The work of all of these individuals has come together in this resource which we dedicate to all of those in, or interested in, Canada's charitable sector.

Malcolm Burrows, President

Bob Wyatt, Executive Director



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Part III Innovation and Intersections

Measuring Impact and Communicating Success

Chapter 34

Big Data Won't Save Us: Fixing the Impact Evaluation Crisis



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Tracey Lauriault, Carleton University

Some suggest that we are in the midst of the “most disruptive and transformative shift in history,” a Fourth Industrial Revolution building on the digital revolution, which is characterized by “a fusion of technologies” and is predicted to offer “huge opportunities to transform social good organizations for the better” (Acker, 2017; Schwab, 2016). Nonprofit professionals are assailed with an unending supply of articles and blog posts extolling the potential of big data, blockchain, and AI. These technologically enthusiastic promises suggest that these newly developed practices will enhance their work and enable their organizations to better demonstrate their impact. While, as technologists and data specialists working with nonprofits, we are attentive to new technological possibilities, we are not disposed to jump on this bandwagon. Instead, we challenge the notion that technology alone will solve the challenges the sector faces – especially the pressure for better impact evaluation. Instead we argue that it is impossible to realize the potential benefits of new technologies for using data without first changing our conception of the problem of impact evaluation and the role of data in addressing it.

Impact Evaluation Is Broken

For decades, the nonprofit sector has failed to effectively measure the impact of its work (Benjamin, 2012; Ebrahim & Rangan, 2014; Schnurbein, 2016). We don't imagine this is revelatory to those familiar with the operation of nonprofit organizations (NPOs): leaders within the sector have been discussing this for years (Hall, Phillips, Meillat, & Pickering, 2003; Lasby, 2019; Phillips & Carlan, 2018). Writing in *Alliance* magazine in 2016, Caroline Fiennes and Ken Berger identify how the “impact revolution” – a movement they've championed that aims to



direct philanthropic resources toward interventions with proven impact – went wrong. It turns out, as Fiennes and Berger make clear, that NPOs have neither the incentives nor the skills to effectively measure their own impact. With exceptions, our experiences within the nonprofit sector have borne this out. As technologists who have spent two decades working to advance evidence-informed decision-making with data within the sector and as an academic studying these and other topics related to our use of data, we have seen firsthand the flaws in our sector's approach to evaluation (Kitchin, Lauriault, & McArdle, 2014).

To better understand this failure, we can start by examining the language that is routinely used to describe the sector's approach to evaluation. People working within the sector would be familiar with the idea that nonprofits often seek to *demonstrate* their impact through evaluation. This framing assumes that programs or interventions have an impact and, further, that the impact is positive. A nonprofit operating within this system will most likely use evaluation to highlight the *successes* of their programs or interventions.

Our choice of words is telling. By assuming that programs have a positive impact so that we only have to demonstrate impact, we have abdicated our responsibility to *determine* the success of our work before we highlight it. The effect of our collective focus on demonstrating impact, rather than determining it, means that we often don't know whether programs are successful. How is it possible to improve programs to better serve intended beneficiaries if we aren't first seeking to determine the actual impact of our work? Whereas our focus on demonstrating impact has led us to emphasize success wherever we can find it, a focus on determining impact would prompt us to ask, "Are the beneficiaries we serve through a given program or intervention better off than people in similar situations who received different services, or no services at all?" (Paul & Elder, 2003)

Our position in this paper is not that the nonprofit sector's approach to evaluation is *irrevocably* broken; we believe in the capacity of our sector to take on this challenge. But we do need to properly identify the problems with impact evaluation to start the work of improvement. For example, consider the question of statistical significance (National Academy of Science, 2018): simply put, there's very little we can learn about the effectiveness of a program by looking at its impact on the small number of clients most NPOs serve. Having an adequate sample size is necessary for any findings to be considered valid. For the most part, even agencies with relatively large programs don't serve enough people for their evaluations to be statistically significant.

A second issue is that most evaluations conducted by NPOs don't make rigorous, if any, comparisons with other programs, particularly those of other organizations. Unless an evaluation is designed to capture how a given program compares to other interventions, or against no intervention at all, we have no idea whether that program is successful. For example, if 15 high school students participating in a mentoring program go on to attend college, we can congratulate those 15 students, but we can't say with any certainty that the mentoring program was the thing that got them there. The same issue of attribution applies to indicators such as the number of children reading at a specific grade level, the number of homeless individuals moved to transitional housing, and so on. In short, the metrics we routinely rely on to demonstrate our success generally provide an incomplete picture of the impact of our work. In addition, NPOs rarely share their data or their evaluations with other organizations, so they often keep reinventing theories of change and metrics (Hall et al., 2003).



Recognizing and accepting the sector's inability to (even approximately) evaluate its work is, as we said, the start of this conversation. However, an even larger question than issues of sample sizes or benchmarks looms for us: why has the nonprofit sector for so long been content to conduct poor evaluations of poor quality, or that we know are meaningless?

Why Is Everything So Bad?

When we say that the nonprofit sector *must* address these inherent flaws in its approach to evaluation, we want to be clear that we see this as a moral imperative. Our sector's failure to properly evaluate its work prevents us from understanding and improving our interventions. We can't reliably know the impact of the services we offer to people and as a result can't determine how to improve those services, which hinders us from making progress within our areas of focus or more broadly as a sector. By allowing the status quo to persist, we are choosing to deprioritize the interests of the communities we serve in favour of the ongoing operations of our organizations.

Although leaders within the nonprofit sector have raised these issues before, perhaps most vocally in the context of international development (Sabet & Brown, 2018), these voices remain a minority. In our experience, conversations within the sector surrounding the challenges of effective evaluation begin, and often end, with two explanations for why evaluations fall short: 1) the complexity of measuring impact, and 2) the incentives created by philanthropic funders that pressure NPOs to use evaluation to demonstrate success.

These explanations highlight very real challenges that deserve closer examination. The sector's impacts *are* difficult to measure. People are not widgets or dollars after all; it is difficult to precisely quantify the changes beneficiaries may or may not experience over time. And, funders do create the incentives that lead to flawed evaluations (Behrens & Kelly, 2008; Buteau, Gopal, & Glickman, 2014; Greenwald, 2013; Mayhew, 2012). In the interests of ensuring the positive impact of their investments, funders naturally seek to fund successful programs or organizations. As a result, nonprofits are kept under pressure to ensure that their programs always appear successful in order to be funded. Our collective mindset toward demonstrating rather than determining impact is borne out of this system. To secure funding, and maintain the ability to continue serving beneficiaries, NPOs must do all they can to establish success.

While we acknowledge these are real and serious challenges, we do not accept that they should prevent us from making progress as a sector toward more effective impact evaluation. These challenges are not so intractable as to prevent the entire sector from moving forward. In fact, the premise that conducting meaningful evaluations poses an insurmountable challenge to a sector devoted to solving some of society's most complex problems should strike us as ridiculous. How can anyone who works for a nonprofit whose mission is to end homelessness or hunger or fight poverty or systemic racism claim that evaluating the impact of their work is just *too hard* to be worth it? Indeed, the measurement dilemmas have been discussed and worked on by NPOs and evaluation specialists for decades (Hall et al., 2003; Mertens & Hesse-Biber, 2013; Vo & Christie, 2018), with at least incremental progress. Rather than contenting ourselves with the explanation that impact evaluation is "stuck" because of measurement issues, we should view improving impact evaluations as one of our most pressing tasks.



The notion that the constraints imposed (intentionally or not) by funders cannot be overcome also needs to be dispelled. When NPOs come together, they have been able to change the behaviour of at least some funders. For example, in the wake of growing pressure from funders for NPOs to reduce their “overheads” (notably administrative and fundraising costs), the sector pushed back against the idea that the merit of a charity is inversely correlated to its overhead expenses (see Chapter 36 by Riseboro). In this case, NPOs have demonstrated some success in educating funders; many funders now accept (and sometimes even appreciate) that appropriate overhead expenses need to be included in the projects they fund. More recently, the growing movement of social justice philanthropy – which recognizes the systemic impacts of philanthropy – is actively working to empower impacted communities to change philanthropic practices (e.g. Edge Funders Alliance). These examples demonstrate that, while NPOs certainly operate within a system that funders have created, it is possible to change the way that system operates (Fantuzzo & Culhane, 2015).

It is important to identify these systemic issues with the current approach to evaluation in the sector, but we need to recognize that these are not insurmountable. Both NPOs and funders have a responsibility to move beyond these standard responses to the problem of measuring our impact. As a sector, we have an obligation to continuously improve our approaches to determining the impact of our efforts on intended beneficiaries in order to improve those efforts. If we as a sector wake up every day prepared to tackle our society’s most intractable problems – poverty, homelessness, climate change, racism, to name a few – then surely we can apply the same perseverance, dedication, and ingenuity to the challenges of measuring the impact of our work.

This takes us to our next question: how, when, and where do “new” technologies and techniques help make impact evaluation more effective?

Aren’t We Already Working on Fixing This?

There is no doubt that stakeholders within the nonprofit sector have identified promising approaches and practices that use data and technology to improve our sector’s approach to impact evaluation. In general, these innovations are tactics that may address specific technical challenges related to impact evaluation. But they are not a solution to the underlying problems. Some tactics are, however, worth exploring so that, as a sector, we can better understand what they can, and cannot, do. In this section, we identify and describe four prominent approaches: 1) big data and machine learning, 2) administrative data, 3) randomized control trials, and 4) impact standards and reporting platforms.

Big Data and Machine Learning

Big data and machine learning (Kitchin & Lauriault, 2018) – also referred to as artificial intelligence or “AI” and in some instances algorithmic decision-making – are among the most discussed new “tools” for the nonprofit sector. While they are distinct practices, they have sufficiently similar characteristics that they can be grouped together for our purposes.



Big data is a term that refers to the set of practices for working with extremely large datasets. While there is no concrete definition of what makes a dataset a “big” one, the defining characteristics are generally the storage capacity, processing power, and methodologies for analysis required to make use of those data (Kitchin & McArdle, 2016). In application, working with big data means interacting with millions – or billions – of records, high in volume, that reveal, via sheer quantity (or volume, variety, or velocity), patterns that would not be discernible in a “regular” dataset.

Big data are usually touted as a means to determine impact by identifying patterns in program results. It is important to note that the conditions under which big data can be collected and analyzed are rarely, if ever, present within the nonprofit sector. The main challenge is a question of supply: individual NPOs or even collaboratives of organizations don’t handle data in a large enough volume to be considered “big data.” Industries and organizations (see the UN Global Working Group on Big Data) that do make use of big data operate in very different contexts, such as processing constantly changing outputs from networks of sensors or analyzing massive amounts of real-time financial transactions. These needs and practices are very far from the reality of information collection related to beneficiary outcomes by NPOs. Ultimately, big data is often an overhyped and misunderstood solution that may offer promise in specific areas but is not applicable to the resolution of the problems facing our sector in terms of impact evaluation.

Machine learning or AI refers to a different set of practices in which algorithms or models for computer-driven decision-making are “trained” using existing data to reliably replicate the decisions and criteria that were contained within that original training data. For example, you can teach a machine to recognize and filter spam emails by giving it many, many examples of accurately labelled real and spam emails from which the machine learns to tell the difference. Like big data, machine learning has been the focus of recent hype in the sector, with examples of fantastical results showing computers capable of identifying patterns and making judgements in a “human” fashion. For the nonprofit sector, the prospect of using AI to predict the outcomes of social programs, and therefore direct resources more effectively, is certainly exciting, and we’re hopeful that advances in this field will continue.

It’s important to recognize, however, that the use of machine learning is applicable only under a specific set of conditions – and can even be harmful when those conditions are not present. It depends entirely on training data that consists of thousands of records – the “right” answers that the machine can learn over time to replicate. This volume of training data generally does not exist and is difficult to create. In addition to being difficult to obtain or create, training data can also be flawed, and therefore limited in how they can be applied by machines. For example, relying on arrest records as training data to allow AI to predict future crimes leads to racial profiling because the arrest records themselves reflect a racial bias (Schlehahn et al., 2015). Ultimately, AI can be useful for tasks that require simple perception (identifying a song you hear on the radio or a face in a photo) and some tasks that require judgement (identifying spam emails or copyright violations). However, it is not reliable when applied to the questions and problems being discussed here. Given this level of inaccuracy, it is likely irresponsible and damaging for our sector to apply machine learning or AI broadly to predict social outcomes.



Administrative Data

The use of administrative data (Statistics Canada, 2019) involves repurposing data collected by the government that result from the administration of programs and services to identify client outcomes resulting from nonprofit interventions. Often these are data related to the records kept about and the services provided to citizens, such as education, employment, social services, or economic development. Because this information relates to the activities of government, it is usually more detailed and granular than data an individual NPO would be able to collect through surveys or other approaches to data collection. For example, recidivism programs can use incarceration records to determine whether a past beneficiary of a rehabilitation program has reoffended and government employment data to determine whether an employment service helped beneficiaries find work. Increasing the ethical (i.e. appropriately transparent and governed) use of administrative data is, in our opinion, one of the most promising approaches to substantially improving impact evaluation.

In practice, expanding the use of administrative data means creating mechanisms for NPOs to access information about their clients' outcomes without sharing access to individual information for each client. This could be achieved, for example, by sending data from cohorts of users to an intermediary who can analyze the data and return aggregate results about the cohort to the NPO. Organizations could learn more about the results of their work from this data than they could from surveys about clients' impressions of a program. Administrative data also allows for the possibility of collecting aggregated data from similar cohorts who did and did not receive the intervention, creating pseudo "control groups" that can be used for comparisons.

In order for administrative data to be used successfully, governments must have data related to outcomes that NPOs are trying to measure. Areas of social service work connected to activities of government – such as employment, education, taxation, and benefits – could benefit. Many programs administered by NPOs, however, would not be connected to those activities, and therefore, government would not have relevant data about that particular group of clients. Even in areas where NPOs can benefit from administrative data, they would still require a sufficiently large client base to obtain statistically significant results.

Randomized Control Trials

Another practice that has achieved more attention in the last two decades, especially in the field of international development, is the application of randomized control trials (RCTs) to NPO interventions. Indeed, RCTs have been hailed as the "gold standard" of evaluation (Camfield & Duvendack, 2014; Bédécarrats, Guérin, & Roubaud, 2019). RCTs, a practice the social sector has adopted from medicine and pharmacology, consist of offering an intervention to a randomly selected group within a beneficiary population while simultaneously gathering data on other members of the population that either did not choose or did not qualify to receive the intervention. By comparing data collected from these two groups, an organization can better determine the impact of a given intervention on that population. If we know, for example, that 80% of people who participated in a job-training program were employed one year later, while only 30% of those who didn't participate in the training found employment, we can conclude the job-training program was effective. RCTs can determine a relationship between interventions and their outcomes; when it's possible, feasible, and ethical for an NPO to use them, they can



improve the quality of evaluations. For an NPO to apply an RCT, however, they must have access to large enough control and beneficiary groups for their results to be statistically significant (read: very large). Significant funding is required to support the activity, as is reliable access to a control group from whom they can collect data and who they can be certain have not received any intervention during the trial. For the most part, these conditions are not present for the interventions of nonprofits. Perhaps most importantly, RCTs can be applied in unethical ways: in the past, RCTs have been conducted in ways that do not respect the rights of the participants. In order to be applied in the nonprofit sector, it is important to consider these risks and potential harms (May, 2012).

Impact Standards and Reporting Platforms

Impact standards and reporting platforms collectively refer to a broad set of practices and initiatives focused on standardizing various aspects of impact data and reporting (see Chapter 33 by Ruff). These range from standardized sets of metrics and indicators to specific platforms that gather and display results for participating projects. These initiatives develop a standard “set” of information to collect and share, and then promote that standard to NPOs and funders to incorporate into their operations and programs. As more organizations join these initiatives and refine the standards, the usefulness and breadth of the data are intended to increase proportionally. In the case of reporting platforms, software is promoted to NPOs working in similar areas, with tools for the collection of indicator data as part of the normal operations of programs. Because these data are entered into a standard system, the data are structured in the same way and are therefore easier to pool together to derive cross-project insights. Specific nonprofit subsectors, such as foster care or nutrition, often have dedicated initiatives and platforms, with measures developed and platforms built around the language and workflows specific to the subsector (Fantuzzo & Culhane, 2015).

While this approach is promising, its success depends on a critical mass of NPOs adopting the shared standards for measurement and using the platforms for reporting their outcomes. This level of buy-in is very difficult to achieve, and these projects often have inadequate strategies for securing adoption. It is also technically challenging to standardize impact measurements and reporting platforms across the sector, where there is often a lack of consensus on the specific data to be collected. This is why more focused subsectors have thus far had more success with this approach.

The challenges of adoption faced by impact standards and reporting platforms are exacerbated by the dominant, project-based funding model in the sector. The long-term nature of these initiatives makes them incompatible with the short-term funding imposed by funders. In addition, the tendency of funders to cherry-pick one of these initiatives at a time also hinders adoption. When one impact standard or reporting platform fails to reach critical mass, it is relegated to the dustbin of history, while funders move on to the next impact measurement panacea.

For these reasons, these standards and platforms will not be able to “solve” impact evaluation at a sectoral level until there is a broad shift in how the sector approaches and funds these types of initiatives.

Although these are all promising *tactics*, none represent a *solution* that can address the sector’s



problem of impact evaluation. Like a city that keeps building more highways in an effort to solve congestion, the sector has failed to address the root cause of the problem. For our sector to move forward, we must change our conception of data and technology to be able to apply them to the challenges of evaluating impact.

Reconceptualizing the Impact Evaluation Problem

As a sector, we need to change our understanding of the problem with impact evaluation and reframe the approach and connection with data and technology. By doing so, we could identify and apply better and more focused solutions, as well as develop new approaches that address the larger problem. The emerging field of critical data studies (Dalton & Thatcher, 2014; Kitchin & Lauriault, 2018) offers some promising directions: specifically, the theory of social shaping of technology (SST) and the concept of data assemblages. While these are important concepts, they are neither complex nor advanced. Rather, they are fundamental concepts that undergraduate and graduate students in critical data studies learn in order to understand, critique, and apply to the use of data and evidence in society. These frameworks provide a necessary foundation for students preparing for careers in developing public policy, conducting academic research, and leading nonprofits. However, critical data concepts and approaches are not yet generally known, understood, or widely applied by people currently working in the sector.

Social Shaping of Technology

Social shaping of technology (SST) theory (MacKenzie & Wajcman, 1985; Bijker, Hughes, & Pinch, 1987) postulates that data, technology, and society dynamically interact with and mutually shape one another. In other words, the development of technology is shaped by society, and that technology has deep impacts on society. The concept of social shaping is used to understand the relationship between the social context that influences technological innovation and the technological context that shapes societal choices.

This theory is contrasted with technological determinism, which argues that technology progresses along a predetermined path, or that technology determines social outcomes. Technological determinism suggests that technologies are inevitable, instrumental, and neutral, but it does not consider how societal factors and human agency shape technology. SST theory asserts that data and related technologies *do not* have a predetermined path but instead emerge as a result of specific social, historical, political, or economic contexts, and then dynamically interact with and impact society in fundamental ways.

This view offers the nonprofit sector a way to understand how choices about the data and evidence we collect and the technologies we implement shape our practices, and in turn affect our beneficiaries. This understanding of the relationship between technology and society allows us to reconceive the barriers to meaningful evaluation as a product of our *social context* rather than simply the result of the data and technological limitations of individual organizations. For example, considering the low quality and piecemeal nature of data systems used within



the foster-care system through this lens shifts our understanding of the problem (Crowell & Nichols, 2020). Our current situation is not the result of the complexity of the information or the technical limitations of the system. In fact, these are standard data- and technology-management questions that have been addressed with some success by many other sectors. The problem with data within the foster-care system is instead the result of our society's deprioritization of the needs of those specific youth. Similarly, our failure to recognize the circumstances of people with disabilities in custodial institutions, or to even count how many of them there are, has rendered this population invisible when it comes to the rollout of the COVID-19 vaccine (Linton, Lauriault, & Chokly, 2021). Their deprioritization is not a data or technological problem; it is a systemic societal problem.

SST theory reminds us that priorities in the sector shape our capacity to collect and use data. If we decide that data matter, we can improve our use of data – and thus our ability to meaningfully evaluate our work – and could prioritize the needs of certain groups. From a practical perspective, solving the problems around nonprofit evaluation requires buy-in from those with social and political power working in conjunction with technologists and data specialists. Neither group can effectively address these problems alone.

Data Assemblages

The second concept we believe would be useful for the sector to adopt is social and technical data assemblages (Deleuze & Guattari, 1987; DeLanda, 2006; Kitchin & Lauriault, 2018). A data assemblage can be defined as a complex socio-technical system, composed of many apparatuses and elements that are thoroughly entwined with the production of data (Kitchin, 2014a: 24). A data assemblage consists of more than the data system/infrastructure itself, such as a big data system, an open data repository, or a data archive. Rather, it includes the technological, political, social, and economic apparatuses that affect their characteristics, function, and development (Kitchin & Lauriault, 2018).

Within the nonprofit sector, a data assemblage includes (but is not limited to) the institutional and funding environment, the organizations that collect data, the type of data collected and their subject matter, the technological systems and tools used, and the mechanisms for governing these systems. Internalizing this broader understanding of data assemblages helps us to conceive of these systems as a combination of *all* their components, and not as discrete actors disassociated from the system, technologies, or databases we produce and the data we use. The sector's beneficiaries, stakeholders, funding streams, and practices are also part of this assemblage that can influence these systems and be influenced themselves. As a sector, when we seek to make changes to the way we approach and apply data practices and technology, we need to include these other components in that work.

The Homeless Individuals and Families Information System (HIFIS), for example, is a data assemblage used by the nonprofit sector to deliver and improve services owned, governed, produced, and managed by the federal government in collaboration with local HIFIS community coordinators and users across the country. It is a national system with local partners and users that indirectly intervenes and accounts for people experiencing homelessness. HIFIS is accessible to anyone who wishes to install and use it, and it allows NPOs to capture, access, and upload information about their beneficiaries in real time, enabling communities to employ a coordinated



approach to address homelessness in Canada. As a data assemblage, HIFIS is more than a system for collecting data about homeless shelter use. It also captures the attitudes and behaviours of its partners, funders, service providers, and academic researchers. It creates mechanisms for shared decision-making about the system's features and uses, applies privacy regulation and other policies at all levels of government, and influences the research being done and the actions taken in this area. Any potential change to HIFIS requires considering these other components – and changes to those components have implications for the software and data (Lauriault, 2018).

As we stated earlier in this section, these two concepts offer a new direction for the sector to approach its problems with impact evaluation. A deeper understanding of the social shaping of technology theory can enable the nonprofit sector to reconceive of our failures to improve our ability to evaluate as a result of our priorities as a sector, rather than as a result of our capacity to collect or use data. Equally, understanding the interconnected components within a data assemblage can shift how we conceive of the “problem” of funders who seek to invest in successful interventions. The behaviours, attitudes, and constraints of our funders are not the external cause of our inability to improve impact evaluations; they are (or should be seen as) one *component* of a data assemblage that also includes data repositories and other technologies. As such, these behaviours and constraints must be considered and adapted to better serve our sector in the same way we would adapt a database to meet our needs.

Conclusion

There is no doubt in our minds that we in the nonprofit sector have failed to meaningfully evaluate the impact of our work. We have a moral obligation to address these limitations with urgency because, as the current pandemic context has highlighted, our beneficiaries are living in crisis. The sector needs to shift from a view of *demonstrating* to one of *determining* impact. We disagree, however, with a dominant narrative that this crisis will be solved primarily by new technologies or data practices. While new technologies or improved data capacity may allow for improvements within individual NPOs, we will continue to fail to move forward as a sector unless we accept the importance of impact evaluation and revise our understanding of what is preventing us from making progress in our use of effective impact measurement. Social shaping of technology theory and data assemblages are two theoretical frameworks that can help us make sector-wide changes in our approach to evaluation. We apply these frameworks in our work and are thankful for the opportunity to share these with you for the benefit of the sector.

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Biography

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Michael Lenczner works in the areas of nonprofit information management and open government. He is a frequent collaborator on academic-community partnerships, and he serves on several nonprofit boards and advisory groups related to technology, democracy, and civil society. He is the CEO of Ajah; director of Powered by Data, a nonprofit initiative on the MakeWay shared platform; and a fellow at the School of Public Policy and Administration of Carleton University.

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Tracey Lauriault is an associate professor at Carleton University's School of Journalism and Communication. She is one of the founders of critical data studies and of open data in Canada. She has expertise in data infrastructures, spatial media, and smart cities and is especially interested in the assemblage of social and technological processes such as artificial intelligence and machine learning (AI/ML), standards, and technologies such as platforms and the internet of things (IoT) that intermediate data and large social and technological systems and infrastructures and how these structure, automate, and govern so much of daily life. She is particularly fascinated by and applies systems thinking to map out the processes by which deep technological infrastructures and vast machines operate. Her scholarship is critical and engaged, and as a data and technological citizen, she works with the makers, governors, and stakeholders of these data, processes, and infrastructures, not only to better understand them but also to ensure that these do not cause harm, and more so that they are governed in an ethical, accountable, and transparent way so as to balance economic development, social progress, and environmental responsibility.

