

# Pandemic-Driven Technology Adoption: Public Decision Makers Need to Tread Cautiously

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## ABSTRACT

During the first six months of the COVID-19 pandemic, around the world, evidence is mounting as to the unevenness of impacts across communities. There are disproportionately more impacts on people who are elderly, economically marginalized, immunologically compromised, and members of racialized and equity-seeking communities. As part of the COVID-19 response, virus transmission mitigation efforts including the use of new technology tools like contact tracing apps are being explored. There are significant implications to the use of these tools, including how they impact different community members and exacerbate digital divide, exclusion, and surveillance issues. This article brings forward a citizen participation framework that is instructive for decision-makers charged with pandemic-driven technology adoption.

## KEYWORDS

Citizen Engagement, COVID-19, Digital Divide, Public Consultation, Public Participation

## 1. INTRODUCTION

Governments around the world are currently making decisions in a pandemic environment highlighted by rapidly changing on-the-ground conditions, and profound future uncertainties. Given the significant human and economic costs of the COVID-19 pandemic, government performance will be under increased scrutiny, including actions taken, warnings heeded, and those ignored. And as the pandemic progresses, one glaring reality is coming into clear relief: the impacts and challenges of the pandemic are not equitably or evenly distributed across society.

As schools closed overnight and governments sent their staff to work remotely from home, students and citizens had no alternative but to use technology platforms to interact with their teachers, city hall staff, and public officials. With the closure of schools, public libraries and other local businesses, people sheltering in place suddenly had their access to communal technology and free public wifi disrupted. Overnight, people were suddenly restricted to working and learning via the technology and internet access they had at home. Family members had to share devices. Work and school were being completed on tablets and mobile phones often using technology platforms instead of software and access to data had to be rationed. The COVID-related measures to impose social distancing deepened the digital divide.

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The impacts and outcomes of the COVID-19 pandemic will drive research agendas for the next decade, particularly for those disciplines studying how government and citizens work together to make decisions and implement actions. While many researchers are shifting their focus to examine COVID-19, for our research team, the government response to this pandemic adds a new dimension to our existing work. Over the past decade, we have examined the impacts of technology on civic participation, and forms of technology adoption by governments. More recently, our team has tracked how smart city technology platforms are introducing new dynamics into the ways that local governments work with their residents. Given the rapid push for governments at all levels to adopt technology to respond to COVID-19 and to better connect with citizens and deliver critical services via technology, we draw on past and current research to highlight the challenges governments may face, and propose key considerations that must not be discarded in the name of speed or efficiency. In particular, we note that the COVID-19 pandemic places greater impact on equity-seeking and racialized groups, and that technology adoption and implementation by government should robustly consider these impacts.

## **2. SMART CITY TECHNOLOGY CHALLENGES APPARENT BEFORE COVID-19**

Drawing on our recent work on government technology adoption, several key themes have emerged through close work with Canadian local government partners that shed new light on how these technologies impacted communities. We found that new technology adoption often comes bundled with the expectations that there will be a positive change or improvement in how citizens relate to governments (Robinson & Johnson, 2016; Sieber, Robinson, Johnson, & Corbett, 2016). These expectations are often based on technology vendor hype, limited real-world testing, and often do not take into account complex implementation environments (Johnson et al., 2015). The high level of enthusiasm behind many civic technology projects underscores the lack of understanding that many technology vendors have of the challenging processes of government. For example, in formal planning situations, local governments have a duty to consult the public and meaningfully involve the public in decision making, through a variety of channels (Johnson & Robinson, 2014). This assumption that technology will solve whatever situation, whether it is the typical challenges of consultation, access to information, or better connecting government to the needs of its citizens, has long been critiqued in technology adoption literature (Rogers, 2010; Janssen, Charalabidis, & Zuiderwijk, 2012). The unintended consequences of technology implementation within planning have been demonstrated for decades, notably by Lee's (1975) "Requiem for large-scale models", that presented how the promised transformation of technology failed to materialize, and even created additional challenges to planning. Unfortunately, even as technology has progressed, the process of implementation and adoption remains fraught with challenges, and often goes poorly acknowledged by those innovators proposing new technologies for sale (Robinson & Johnson, 2016; Graham, 2020).

Our recent work interrogates the use of technology as a conduit for government-citizen interactions. With the Sidewalk Labs Quayside project in Toronto (2017 to 2020) and the Government of Canada's Smart Cities Challenge (round one winners announced May 2019), there have been numerous opportunities to explore the kinds of smart city technologies available to communities (Johnson, Acedo, & Robinson, 2020; Infrastructure Canada, 2019; Robinson and Coutts, 2019). The pitch to adopt these technologies is familiar. Vendors propose that the use of their technologies will make communities more efficient, inclusive, accountable, democratic and sustainable. But the same cautions apply to new smart cities technologies as did to earlier digital technology innovations including the geoweb and open data. When we move beyond the surface of the vendor pitch to explore the kinds of technologies being used and the ways in which these tools mediate relationships between citizens and local governments, instead of enabling transformation, instead the relationship may become more transactional (Johnson, Robinson and Philpot, 2020). We are concerned about the emergence

of the “transactional citizen” enabled through the use of platform technology to position citizens in regard to their local governments. Smart city sensors and technology platforms make it easy to count people and to capture quick reactions (e.g. liking a social media post). When governments consult or engage their citizens using technology platforms, it is certainly much easier to create a high number of shallow interactions generating quantities of data. This stands in contrast to engaging citizens in more challenging deliberative processes that include citizen perspectives in a more complete form, with a focus on identification of community priorities from the bottom-up. These richer forms of contributions and engagement are fundamental to ensuring that new government projects and investments are accountable and responsive to citizens’ needs and aspirations.

### **3. TECHNOLOGY-RELATED DISPARITIES BROUGHT INTO EVEN CLEARER RESOLUTION DURING COVID-19**

To support the COVID-19 response, technologies of various types are being used for data gathering, information sharing, two-way communication, and importantly as a direct support for decision-making. Governments collect data from hospitals and public health units to inform their decision-making around reopenings, for example. Mobile technology companies make user location data available to governments (Oliver et al., 2020, Ram & Gray, 2020) to help with contact tracing. These applications promise to impose a virtual fence on individuals, hoping to ensure compliance with self-quarantine and to reduce the spread of new infections<sup>1</sup>. It is important to evaluate how this rush to technology-as-a-mitigation-tool may impact government-citizen interactions, especially those around decision-making, citizen participation, and in planning economic and social responses to the impacts of COVID-19. Lessons learned from the adoption of previous technologies are relevant, and should be considered, particularly in how citizens are represented – as simple masses of data points, or as individuals and communities with diverse needs and perspectives.

While many technology firms have taken the adage “a crisis is an opportunity too good to waste” to heart, progressive urbanists and community organizers find this framing deeply troubling. In this pandemic we have seen the impacts of COVID-19 land with disproportionately negative impacts in racialized and equity seeking communities. The APM Research Lab’s project *The Colour of COVID* most recently shared: “The coronavirus has claimed nearly 133,000 American lives through July 7, 2020. We know that race and ethnicity account for 91% of these deaths (APM, 2020)”. Canadian placemaker Jay Pitter sounded the alarm early on about how broad sweeping analyses of urban density were not paying sufficient attention to the nuances of poverty, race, gender and their relationships to the social determinants of health (Pitter, 2020a).

The Canadian Human Rights Commission (CHRC, 2020) further added: “Now more than ever, people living in vulnerable circumstances need our support. We must ensure that we strike the appropriate balance between protecting public health and safety and respecting human rights. We must be fully mindful of how this crisis is amplifying the challenges and disadvantages faced by people living on the margins of society.” In addition to Black and Indigenous communities, evidence is mounting that decision-makers in Canada, and abroad, must more carefully consider and respond to the ongoing impacts of COVID-19 on people with disabilities, children, people with housing and food insecurity, women and children leaving domestic violence, single parents, members of LGBTQ2I communities, the elderly, people seeking other medical treatments, and incarcerated individuals (CHRC, 2020; Pitter, 2020b). We flag these challenges in the early stages of COVID impact and response because the pandemic is having disproportionately negative impacts in certain communities of people. Together the rise of new technology tool deployment in these same communities during a global pandemic can create a situation in which further inequities are accelerated at a larger scale, and approaches to citizen engagement become entrenched, and the channels to meaningfully respond to citizen concerns are weakened.

#### 4. PANDEMIC-DRIVEN TECHNOLOGY ADOPTION

Given the pressing issues at hand, it may seem there are potential efficiency gains to be achieved from the adoption of new forms of technology. The adoption process itself, by pandemic-imposed necessity, is proceeding at an accelerated rate. Given the profound societal and economic impacts of the pandemic, politicians and decision-makers are actively seeking the best possible solutions as quickly as possible to reduce the loss of life and to mitigate impacts.

The emergency migration to working and learning from home and sheltering in place had significant consequences. Before the pandemic, collectively we were already well aware that these same communities being disproportionately impacted by COVID-19 also faced barriers to access to hardware, software and Internet connectivity. These issues are compounded by the equity and inclusion challenges embedded in the platform tools themselves (Fields, Bissell, & Macrorie, 2020; Leszczynski, 2020). The last five years have seen a rise in research that robustly demonstrates that technology platforms are not neutral. Two recent popular works, *Weapons of Math Destruction* (O'Neil, 2016) and *Artificial Unintelligence* (Brossard, 2018), provide example after example of how technology platforms have embedded decision-making bias and how these tools create further distance between those who are negatively impacted and those with the power to offer redress. Eubanks (2018), McIlwain (2020), and D'Ignazio and Klein (2020) all emphasize the vital importance of a more equitable approach to technology and data efforts by focusing on the discreet needs of communities to ensure their concerns are resolved rather than exacerbated by these tools. The mechanisms through which these voices are engaged in the design process has a significant impact on the extent to which the outcomes meet participants' needs (Costanza-Chock, 2020). When this research is considered together, there is a vital thread running through research about the limits and biases in technology is that when issues arose, the technology didn't correct itself. Rather, it was the communities of people who were impacted by it who raised the concerns.

Civic technologies, which are intended to deliver public-good outcomes in their design including those being proposed to respond to COVID-19, are vulnerable to the same limitations as for-profit technology tools. They too risk compounding many of the exclusion and discrimination issues that have surfaced through the introduction of other technologies. Civic intent does not preclude having negative social outcomes including cementing a transactional relationship between citizen and government, as citizens become reduced to data points. In effectively reducing the voice of the citizen to that of what can be easily collected via technology, concerns of already excluded community members become lost.

During the pandemic municipalities are migrating their public consultation and engagement efforts online balancing the need for social distancing with democratic obligations to work with the public. As citizens become removed from the more challenging, involved, slower, traditional forms of citizen engagement, and funnelled towards transactional forms of engagement, supported by technology, opportunities for robust, quality, civic discourse are lost, replaced with an emphasis on speed and quantity of connections. What are the long-term implications of citizens being reduced to transactive data types? When it is safe to do so will we see governments return to a mix of richer citizen-government interactions? Or will a more transactive form of citizen-government interaction persist because governments lack the capacity to do the important engagement work? If governments rely more on transactional interactions with citizens, how will citizen feedback on the tools be meaningfully addressed and resolved? As we have seen pre-pandemic, these feedback mechanisms are imperative to identifying when technologies exclude or negatively impact communities of people.

#### 5. CONCLUSION

During this global pandemic, decision-makers and researchers charged with making new technology platform deployment decisions have a series of pressing considerations, and must bring a critical eye to gaps between the vendor's sales pitch, and the actual potential of the tools to deliver on

these promises. Before technology is deployed, it is imperative to evaluate the current state of how COVID-19 is impacting the community in which the tools will be used. There must be sufficient data and evidence to understand who is most negatively impacted, and technology evaluated for transparency, accountability, and bias.

The deployment of technology tools in a time of COVID-19 has the potential to create the “perfect storm” of challenges. We have a virus that compounds existing social and economic inequalities, and technology tools that do the same. Historically, the ways in which these negative impacts have surfaced is through communities raising their concerns to governments and technology designers. Yet these tools have the potential to reduce citizen involvement to a series of transactions, thus reducing the volume and magnitude of citizen voices and diluting government’s capacity to respond. Put simply, the tools we think might help with the virus response, may accelerate and expand these negative impacts while also reducing the opportunities for impacted community members to be heard. As previous experiences have demonstrated, the voices of citizens must be central to understanding when new technology tools have perverse outcomes. If technology reduces the capacity for citizen voices to be heard, during this time of a global pandemic, it is possible that these tools will undermine the very people they were intended to help.

## REFERENCES

- APM Research Labs. (2020). *The Color Of Coronavirus: Covid-19 Deaths By Race And Ethnicity In The U.S.* <https://www.apmresearchlab.org/covid/deaths-by-race>
- Brossard, M. (2019). *Artificial Unintelligence*. MIT Press.
- Canadian Human Rights Commission. (2020). *Statement - Inequality amplified by COVID-19 crisis*. <https://www.chrc-ccdp.gc.ca/eng/content/statement-inequality-amplified-covid-19-crisis>
- Costanza-Chock, S. (2020). *Design Justice: Community-Led Practices to Build the Worlds We Need*. MIT Press. doi:10.7551/mitpress/12255.001.0001
- D'Ignazio, C., & Klein, L. (2020). *Data Feminism*. MIT Press. doi:10.7551/mitpress/11805.001.0001
- Eubanks, V. (2018). *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. St. Martins Press.
- Fields, D., Bissell, D., & Macrorie, R. (2020). Platform methods: Studying platform urbanism outside the black box. *Urban Geography*, 41(3), 462–468. doi:10.1080/02723638.2020.1730642
- Graham, M. (2020). Regulate, replicate, and resist – the conjunctural geographies of platform urbanism. *Urban Geography*, 41(3), 453–457. doi:10.1080/02723638.2020.1717028
- Infrastructure Canada. (2019). *Smart Cities Challenge*. Retrieved from <https://www.infrastructure.gc.ca/cities-villes/index-eng.html>
- Janssen, M., Charalabidis, Y., & Zuiderwijk, A. (2012). Benefits, Adoption Barriers and Myths of Open Data and Open Government. *Information Systems Management*, 29(4), 258–268. doi:10.1080/10580530.2012.716740
- Johnson, P. A., Acedo, A., & Robinson, P. (2020). Canadian Smart Cities: Are we wiring new citizen-local government interactions? *The Canadian Geographer: Geographie Canadien*, 2020(May). doi:10.1111/cag.12623
- Johnson, P. A., Corbett, J. M., Gore, C., Robinson, P., Allen, P., & Sieber, R. (2015). A Web of Expectations: Evolving Relationships in Community Participatory Geoweb Projects. *ACME: An International E-Journal for Critical Geographies*, 14(3), 827–848.
- Johnson, P. A., & Robinson, P. (2014). Civic Hackathons: Innovation, Procurement, or Civic Engagement?: Civic Hackathon: Procurement or Civic Engagement? *The Review of Policy Research*, 31(4), 349–357. doi:10.1111/ropr.12074
- Johnson, P. A., Robinson, P., & Philpot, S. (2020, January). Type, tweet, tap, and pass: How smart city technology is creating a transactional citizen. *Government Information Quarterly*, 37(1), 101414. doi:10.1016/j.giq.2019.101414
- Lee, D. B. Jr. (1975). Requiem for large-scale models. *ACM SIGSIM Simulation Digest*, 6(2–3), 16–29. doi:10.1145/1102945.1102950
- Leszczynski, A. (2020). Glitchy vignettes of platform urbanism. *Environment and Planning, D, Society & Space*, 38(2), 189–208. doi:10.1177/0263775819878721
- McIlwain, C. D. (2020). *Black software: The Internet and racial justice, from the AfroNet to Black Lives Matter*. Oxford University Press.
- O'Neil, C. (2016). *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*. Crown Publishers.
- Oliver, N., Lepri, B., Sterly, H., Lambiotte, R., Delataille, S., De Nadai, M., Letouzé, E., Salah, A. A., Benjamins, R., Cattuto, C., Colizza, V., de Cordes, N., Fraiberger, S. P., Koebe, T., Lehmann, S., Murillo, J., Pentland, A., Pham, P. N., Pivetta, F., & Vinck, P. et al. (2020). Mobile phone data for informing public health actions across the COVID-19 pandemic life cycle. *Science Advances*, 6(23), eabc0764. Advance online publication. doi:10.1126/sciadv.abc0764 PMID:32548274
- Pitter, J. (2020a). *Urban Density: Confronting the Distance Between Desire and Disparity*. <https://www.azuremagazine.com/article/urban-density-confronting-the-distance-between-desire-and-disparity/>

- Pitter, J. (2020b). *Call to Courage: A letter to Canadian Urbanists*. <https://canurb.org/wp-content/uploads/OpenLetter-ACallToCourage-Final-June2020.pdf>
- Ram, N., & Gray, D. (2020). Mass Surveillance in the Age of COVID-19. *Journal of Law and the Biosciences*, 7(1), Isaa023. Advance online publication. doi:10.1093/jlb/Isaa023 PMID:32728466
- Robinson, P., & Coutts, S. (2019). The case of Quayside, Toronto, Canada. In L. Anthopoulos (Ed.), *Smart City Emergence: Cases From Around the World* (pp. 330–350). Elsevier. doi:10.1016/B978-0-12-816169-2.00016-X
- Robinson, P., & Johnson, P. A. (2016). Civic Hackathons: New Terrain for Local Government-Citizen Interaction? *Urban Planning*, 1(2), 65–74. doi:10.17645/up.v1i2.627
- Rogers, E. M. (2010). *Diffusion of innovations*. Simon and Schuster.
- Sieber, R. E., Robinson, P., Johnson, P. A., & Corbett, J. M. (2016). Doing Public Participation on the Geospatial Web. *Annals of the Association of American Geographers*, 106(5), 1030–1046. doi:10.1080/24694452.2016.1191325

## ENDNOTE

- <sup>1</sup> See more on these tools in two other articles in this special issue: in Teresa Scassa; and in Michael McCall et al. (Note by the Editor).

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