Data, Dialogue, and Innovation: Opportunities and Challenges for "Open Government" in Canada

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Abstract. In a rapidly evolving online environment where the inter-relationship between information and innovation is evolving from primarily closed and inward structures to much more open and networked governance arrangements, the public sector faces growing pressures and new opportunities to reform and adapt. Open data and big data are now widely embraced initiatives to spur innovation both inside of and outside of the public sector. Their capacity to foster innovation is nonetheless shaped by critical tensions between traditional government structures and culture on the one hand and more open and participative notions of governance on the other hand. Within such a context, this article examines the current Government of Canada Open Government Action Plan and its three main dimensions: information, data, and dialogue. The analysis reveals that despite some progress in the realm of open data, information and dialogue are constrained by the aforementioned tensions and the need for wider reforms to various architectural facets of the public sector – administratively, technologically, politically, and socially. Across each of these layers, we consider the sorts of wider reforms required in order to facilitate systemic innovation within the government and across sectors.

Keywords. Open Government, Innovation, Governance, Digital Data, Information, Dialogue, Engagement, Transparency.

1   Introduction

In a rapidly evolving online environment where the inter-relationship between information and innovation is evolving from primarily closed and inward structures to much more open and networked governance arrangements, the public sector faces growing pressures and new opportunities to reform and adapt. Accordingly, 'open government' has become a new mantra across much of the democratic world, arguably stemming from President Obama's 2009 inaugural Presidential Directive on Openness and the various US federal government initiatives that ensued. The Organisation for Economic Co-operation and Development (OECD) describes open government as 'The transparency of government actions, the accessibility of government services and information, and the responsiveness of government to new ideas, demands and needs' (Ubaldi, 2013). More than sixty countries have now subscribed to the Open Government Partnership, a global declaration of principles meant to facilitate political buy-in and a commitment to specific actions plans.

While one important aim of open government is heightened transparency in improving democratic awareness, oversight an involvement, an equally important objective is to enable innovation to occur both within the public sector and across the

private sector and civil society at large. Central to this direction is the notion of open data – releasing raw data sets previously stored internally and viewed as proprietary, in order to spur their shared utilization in ways that drive collective learning and create new forms of both public and private value. There are expanding calls for governments to leverage and embrace data-driven innovation:

> *Open up public data, particularly publicly funded data. Clearly, the economic potential of these and other important public datasets can only be fully exploited if the most innovative and creative entrepreneurs have full access to data;*
>
> *Find creative ways of tackling privacy, security, and intellectual property concerns while allowing the exploitation of the full economic potential of big data (p.8, Sousa, 2013).*

This accompanying lens of big data - defined by the OECD as the tremendous expansion of volume, variety, and velocity of data flows across all sectors, both reinforce open government tendencies while also contradicting them. This is so since big data encompasses and builds upon open data in one sense: nevertheless, the management and usage of such vast and largely automated data systems are often invisible and/or explicitly shielded from public purview due to a variety of reasons (chief among them being national security). Traditional government, moreover, for reasons explained more fully through this article, features contradictory stances toward transparency and secrecy even prior to the overlay of data-driven reforms (Roy, 2013a/b). The resulting tensions surrounding information management and data openness lie at the heart of efforts to pursue innovation via open government.

Such tensions are compounded by a third and equally complex dimension of open government - namely public engagement and dialogue (Lee and Kwak, 2011; Roy, 2013a). As an illustration, the participatory spirit of the Government of Canada Open Government Action Plan (a primary focus of this article) has been recognized by the Information Commissioner of the Australian State of New South Wales:

> *Since its introduction in 2011, 'Canada's Action Plan on Open Government' has been refined in response to greater recognition of social, economic and technological developments. Modifications in 2014 provided opportunities for citizens to better understand and participate in government and its processes; and drive innovation and maximise economic opportunities to create a more cost-effective, efficient and responsive government (p.1, Tydd, 2015).*

The objective of this article is to dissect the governance of this action plan and its capacities for spurring innovation both internally and across society at large. This critical case study approach is based upon the following evidentiary layers: first, a selective literature review on open government and how this concept encompasses the inter-related elements of open data, big data, and innovation (building upon prior contributions of this author to the scholarly literature); secondly, direct observation of the Government of Canada's consultative exercise undertaken to help inform this action plan as well as likeminded forums with public sector managers from all levels of government; thirdly, classroom interactions and discussions with dozens of mid-career public servants pertaining to the information culture and open government

initiatives of the federal government; and fourthly, a series of semi-structured interviews with fifteen government and industry managers engaged directly or indirectly with various elements of the Open Government Action Plan. Supplementing this Canadian case study are scholarly and applied examples from likeminded democratic countries, notably the United States and the United Kingdom.

The article is organized as follows. Following this brief introduction, section two examines the evolution of open data and open government in Canada. Section three then focuses on big data – and countervailing tendencies toward more closed government (in line with the inertia of traditional democratic structures and public sector governance). Section four examines tensions between data-driven and more deliberative notions of innovation and learning within democratic contexts, and if and how governments are attempting to surmount such tensions. Building upon this analysis, section five proposes a set of directions for public sector governance reforms, both administratively and democratically, that will better allow for the pursuit and realization of systemic openness and collective innovation. The article then concludes with a summary of the main lessons learned and some proposed future research directions.

2   Open Data and Open Government

New participatory mechanisms, systemic openness, and virtualization are underpinning an emerging governance ethos that, for the public sector, is often termed as the emergence of Gov 2.0. At the heart of Gov 2.0 are drivers of collective intelligence and more collaborative forms of governance that are typically associated with a widening online universe and less hierarchical and control-minded forms of governance (Shirky, 2008; Wyld, 2010; Lips, 2012). From both external vantage points on new societal formations (such as Wikipedia and a myriad of social media-driven movements) as well as internal to the public sector (what Lips characterizes as 'public administration 2.0'), governments are increasingly challenged to move beyond a typology of hierarchies and markets and embrace usage of networks typically more open and collaborative in formation and execution (Stoker, 2005; World Economic Forum, 2011; Kostakis, 2011; Reddick and Aikins, 2012; Gil-Garcia, 2012; Roy, 2013a/b).

Governments are embracing such changes which present significant structural and cultural shifts. Aligned with the spirit of such principles, the spreading of web 2.0 experimentation within government is specifically meant to foster collaboration and democratize the creation and exchange of ideas:

> *The role of citizens in an open government environment – enriched by open government data – can be one of democratic innovators. In an ongoing open innovation process, citizens can draw on open data, and propose both policy-areas to tackle and technical approaches to take (p.186, Maier-Rabler and Hubler, 2011).*

The potential recasting of governance in terms of expectations and roles is profound. Rather than gathering information and ideas via highly regimented and contained mechanisms (shaped by a proprietary mindset), this alternative presentation of

openness and ideas begins from the premise that the ownership of information and ideas is fundamentally diffused and shared. At the same time, however, such an ethos of openness invariably faces strong pushback from both the traditions of proprietary protection and its organizational cousin that is particularly prevalent in the public sector - namely hierarchical and informational control. For example, one early study of the usage and acceptance of new social media within the public sector found such tensions deeply engrained within Canadian government where information is viewed predominantly as a proprietary asset. The authors conclude that the most significant impediment to Gov 2.0-inspired reform is the 'clay layer' embedded by a hierarchical public service culture (p.3, Fyfe and Crookall 2010). Along with much fanfare in that country with respect to open data initiatives, an independent review of information management processes within the British government found 'concern about publishing data externally' (p.3, Read, 2012).

By contrast, within the rubric of open government, the notion of open data is based upon the 'notion that public sector information is a resource, the release of which will maximize its social and economic value to citizens' (ibid.). In the Netherlands, for example, an impetus for non-proprietary public data came from the Dutch courts in April of 2009 when a City of Amsterdam's appeal to impose restrictions and fees over several its data holdings was rejected (Ubaldi 2013). Such clashes between proprietary and openness, and control and empowerment shape the pursuit and effectiveness of open data and its wider ramifications (Bermonte, 2011; Roy, 2013a). Outside of government too, similar tensions between proprietary and open systems are prevalent across many segments of industry and society (Wyld, 2010; Public Administration Committee, 2011; World Economic Forum, 2011).

Yet a widening ethos of openness draws sustenance from: i) the Internet as a platform for democratization in the broadest sense; ii) the search engine and a widening array of self-expressive and interactive web 2.0 tools and platforms; and iii) most recently the advent of mobility. As Young puts it, the cloud as a symbolic basis of a wider virtual universe driven by a myriad of smaller and more powerful and mobile computing devices, a penchant to share more and more personal information online – especially via social media, and a new form of enhanced and shared networked intelligence (Young, 2012). At the same time, however, accompanying optimistic portrayals of the potential benefits of such intelligence come offsetting concerns pertaining to individual privacy, while open data has similarly sparked fresh concerns about the digital divide and accentuating new forms of 'data divides' (Halonen, 2012).

Indeed, as important to government efforts to release data is society's interest and ability in accessing and making use of it. Open data's origins are interwoven with a growing community of activists and apps developers working initially within the confines of privately-developed operating system platforms such as Apple and Android (the latter built from open sourced coding and thus more portable across a range of companies and devices). The participative flavour of such movements can and has also extended beyond commercial pursuits, as exemplified in February 2013 by the inaugural open data day (that has since grown into a global network of more than 200 community-based events around the world).

In Canada, as an important precursor to explicit open data strategies, one early

example of the potential for government to embrace an ethos of openness came from the City of Nanaimo, British Columbia, on the west coast of Canada which effectively abandoned its prior model of internalized and proprietary and infrastructure and information holdings within the realm of geographic information systems and spatial data mapping. Citing the benefits of open innovation through greater usage and access and heightened redundancy and security, the municipal government opted for open source tools (including freely available Google Earth online) and shifted its data imaging that it previously regarded as a proprietary asset to Google's cloud-enabled platform (Birch, 2008). Some five years later, this same municipality would become the first in Canada to adopt a 'Pan-Canadian Open Government License' for its data holdings.

More than thirty Canadian municipalities, of all sizes, have now undertaken open data strategies. One such example, adopted in 2012 by the City of Halifax puts forth the following drivers of doing so (summarized here): restrictive data policies limiting the public good; costly and inefficient public data sharing processes; local community movements seeking greater data access and usage; open data as a driver of economic growth; and open data as a platform for increased transparency and citizen engagement (Halifax Regional Council, 2012). Whereas the first and second drivers apply mainly to the internal apparatus of information management by the municipality, the latter themes underscore the wider societal and participatory dimensions of open data as a key source of collective innovation across both civic and economic pursuits as well as the interdependencies across both realms.

Spurred by this local emergence of initiatives on the one hand, and by the emergence of an international network of countries committed to open government principles on the other hand, the Government of Canada released its own Open Government Action Plan in 2012, having since updated it to include a series of initiatives and objectives for the timeframe of 2014-2016. The action plan is based upon three inter-related dimensions: information, data, and dialogue. Whereas 'information' centres mainly upon transparency about government operations and research, 'data' is most closely associated with online technologies and open data platforms in line with the aforementioned strategies of many Canadian municipalities. Finally, 'dialogue' is based upon the engagement of citizens in democratic governance, thereby illuminating at least the potential for inter-linkages between open data, open government and the wider participatory currents of Gov 2.0.

Any reasoned assessment of open government in Canada would nonetheless conclude that of these three dimensions, only 'data' has been acted upon with any degree of seriousness as reflected by tangible initiatives. Along with releasing a large number of data sets via its own open data portal, the Government of Canada has sought to collaboratively forge a pan-Canadian license for such data sharing that would be portable across all government levels in Canada. It has also created a national 'hackathon' (the Canadian Open Data Experience) to spur usage of the public data sets through coding and applications development in three categories: youth, commerce, and quality of life. Additionally, Canada has been recognized internationally for having made some strides in its open data endeavours (World Wide Web Foundation, 2015).

Therefore, while open data arguably remains at its inception – with little research as

yet seeking to quantify its impacts and return on investment, we can at least point to specific undertakings and progress. Why, then, is it so difficult to make similar claims with respect to information and dialogue, and how does the absence of seriousness in these two dimensions impact the governments capacities to be an innovation catalyst? The next two sections address each of these important questions in turn.

3   Big Data and Closed Government

While openness and ownership of data resources lie at the heart of the Government of Canada Open Government agenda, the traditional public sector culture of information resources and management runs directly counter to such currents: on this point there is widespread agreement from scholars, media observers, and public sector oversight bodies alike (Bermonte, 2011; Read, 2012; Ubaldi, 2013; Roy, 2013a). There is also evidence that the Canadian Westminster model is a particularly egregious example of centralized and control-minded information management, even relative to its Parliamentary peers in Australia and the United Kingdom (Aucoin et al., 2011; Roy, 2013a).

There are both political and operational dimensions to such a charge. Politically, governments struggle with messaging and communications and a traditional media apparatus that often promotes information protectionism and spin (Martin, 2010). Operationally, governments have traditionally managed their digital infrastructure via proprietary software and hardware systems that reinforce confidentiality and a control-minded mindset in terms of procurement and contracting, leading one British Parliamentary review to characterize such conditions as a 'recipe for rip-off' (Public Administration Committee, 2011; Roy, 2013a). Such a political and organizational apparatus as it has evolved over past decades is thus poorly suited to a genuine cultural commitment of open government (beyond narrow and precise actions such as opening up specific data sets).

Accordingly, the Government of Canada's organizational architecture for managing its Open Government agenda personified such tensions. The unit responsible for open government is housed within the central agency (Treasury Board) responsible for expenditure management controls for the government as a whole. The same Minister is thus dually responsible for overseeing a traditionally inward and control-minded organization and facilitating an alternative governance mindset predicated upon openness. While in fairness it should be noted that the Chief Information Officer's Branch is also located within the same central agency – thus providing a platform for government-wide management of digital infrastructure, the previously noted lament from the British Parliamentary Committee also applies in equal measure here: a predominantly proprietary approach to managing such systems is much more in line with the control-minded aspects of Treasury Board than its novel embracement of systemic information and data openness.

The resulting context for dialogue – the third dimension of the Open Government agenda, is predictably minimalist and constraining, featuring a highly general set of promises to improve opportunities for public input and engagement in policy and services processes. Beyond the aforementioned example of the 2015 Hackathon, there

are few if any concrete initiatives designed to spur wider public conversations about data openness and innovation. Similarly, while the government plan invokes new social media platforms for expanding public engagement, research has instead shown that Government's usage of social media is largely focused on communications and information provisioning, rather than listening and interaction (Fyfe and Crookall, 2010; Roy, 2013a). Here once again the organizational architecture further constrains innovative approaches for outward governance in so far as the two central agencies tasked with leading this dialogue dimension (Treasury Board and Privy Council Office) and poorly suited to such a role given their centralizing functions (ibid.).

In contrast to such positioning, evidence from comparative research suggests that innovative public engagement requires a newly created organizational unit with the competencies and culture conducive to such an alternative role (World Economic Forum, 2011; Mergel, 2012; Dalakiouridou et al., 2012). Beyond a sub-unit of Treasury Board and the CIO Branch with responsibilities primarily focused on open data initiatives, the absence of new organizational actors in order to facilitate a government-wide focus on information management and public engagement (or dialogue) reinforces the notion of closed government and can only constrain the pursuit of innovation within and outside of government.

Importantly, this point has been recognized by other governments even within Canada, notably the Province of British Columbia which created an inter-Ministerial task force that, in turn, has recommended the creation of a new and autonomous agency to shift beyond its existing open data effort (that in many respects mirrors the model of the Government of Canada) and to focus on collaborative opportunities within and outside of government to leverage big data for new and wider forms of innovation:

> *The intent for the centre is to create a hub of interaction, exploration, analysis and innovation. It is targeted at a wide range of users to enable enhanced engagement and collaboration between these groups on key questions of interest to each (p.6 BC Centre for Data Innovation, 2014).*

As discussed previously, an important lesson of public administration is that traditional top-down and control-laden structures of Westminster-stylized governance – personified by central agencies such as the Government of Canada's Treasury Board, are poorly suited to devising more outward and collaborative forms of governance. As such, this BC example responds to this truism at least conceptually in proposing an alternative governance mechanism more suitable to charting new public sector capacities more appropriate for a networked and data-rich era.

An accompanying challenge surrounds the extent to which such capacities are genuinely participatory and encompassing of meaningful public dialogue, a stated aim of the Government of Canada Open Government Action Plan. Underpinning this challenge is the question of whether data-driven innovation requires such participation, or instead whether increasingly computational and algorithmic processes are the primary drivers of value creation and innovation. Understanding this challenge, and government responses to it, require a deeper consideration of innovation and its relationship to both data and dialogue.

4   Data versus Dialogue in Innovation

The inclusion of dialogue as one of three pillars of the Government of Canada's Open Government Agenda (along with data and information) is testament to the importance of human interaction and participation as drivers of innovation, either within or between organizations or across societies at large. Indeed, building upon the Obama impetus, Lee and Kwak articulate a set of four escalating levels of such participation culminating in the realization of 'ubiquitous engagement' as the ultimate set of conditions for driving collective innovation in such a manner (Lee and Kwak, 2011).

At the same time, there are tensions between data and dialogue – reflecting wider tensions between automated and analytical processes on the one hand (that are at the heart of big data systems), and more human, interactive and deliberative processes on the other hand. A number of prominent voices have expressed concern that the former comes at the expense of the latter. A case in point is technology critic Nicholas Carr who surprised many with his characterization of Google as a bureaucratic leviathan, less in terms of how the organization treats its workers internally and more in championing an algorithmic society that reduces individual freedom and cognition as more and more decisions are instead automated (and thus standardized):

> *What Taylor did for the work of the hand, Google is doing for the work of the mind. In Google's view, information is a kind of commodity, a utilitarian resource that can be mined and processed with industrial efficiency. The more pieces of information we can "access" and the faster we can extract their gist, the more productive we become as thinkers (Carr 2008).*

A similarly critical tone underpins a Guardian article entitled, 'The rise of data and the death of politics' which essentially argues that in an increasingly data-driven environment, traditional forms of discursive politics loses out as consumerism and immediacy further reinforce individualization and analytical capacities over more collective forms of engagement (Morozov, 2014). Nabatchi strikes a similar chord in her portrayal of a 'citizenship and democratic deficit' increasingly prominent in today's online world (Nabatchi, 2010).

The salient point to recognize here is that such viewpoints tie together democracy and innovation in ways that are often under-appreciated or ignored by big data proponents within government and perhaps especially in private sector companies cultivating data capacities of one sort or another. In three essential ways, government's ability to pursue and foster innovation both internally and across society is contingent upon dialogue: first, collective intelligence as discursive and participatory processes; secondly, diversity and inclusion as innovation stimulants; and thirdly, political literacy underpinning governmental investments and actions and how such actions are gauged and adapted over time.

On the first point, there are of many prominent voices countering the assertions of Carr and others as to the evolution of governance in an increasingly online and inter-connected world (many referenced in earlier sections of this article depicting the rise of Gov 2.0). Underpinning many such voices is a philosophy of governance predicated upon grassroots engagement, spontaneous forms of activity, and learning

and adaptation. Linking such attributes to big data and social innovation, Desouza and Smith suggest that the promotion of 'virtual experimentation platforms' are essential in order to 'increase our understanding of how to use big data': such platforms are predicated about social interaction and human collaboration (Desouza and Smith, 2014). Sifry makes a similar critique of the technocratic rise of big data systems that largely favour private value creation over civic engagement and public value, suggesting that devising ways to cultivate smarter citizens is as important if not more important than designing smarter governance systems (Sifry, 2014).

This latter point speaks to the second theme above, namely the importance of diversity and inclusion to cultivating an environment conducive to innovation. The embracement of hackathons and apps competitions by governments at all levels in Canada is a case in point, in extending the public sector's reach to a wider set of competencies and a wider realm of creativity than otherwise available internally or even via more traditional partnering arrangements with outside experts such as consultancies. Yet by the same token, socio-economic polarization driven largely by educational attainment is viewed as significant challenge in this increasingly digital and data-centric world (Jaeger 2012; Janssen et al. 2012). One study of such initiatives from a British think tank pointed to widening 'data divides' that basically reflect the application of historically-rooted and potentially now reinforced forms of digital divides to this new data intense landscape (Halonen, 2012). If the public sector is to encourage smarter citizens as well as smarter governance systems – and foster civic-based forms of innovation to spur public value creation alongside private value creation, societal inclusiveness and collective innovation must be viewed as intertwined objectives.

The third point above - namely political literacy, follows from the preceding themes in so far as an engaged and inclusive society well versed in the opportunities and risks of big data and seeking collective innovation for both private and public purposes will likely yield – and more to the point at hand, requires a digitally and data literate political class. By contrast, a highly technocratic data regime – as we often see exemplified by national security efforts invariably generating controversial outcomes in secret before eventual exposure (typically by stakeholders and activists outside of formal political institutions), breeds suspicion and distrust (Roy, 2015).

While global rankings lauding the US and UK as open government leaders may be contested by some due to the source of these rankings, it does bear noting that both jurisdictions share well documented ambitions for various facets of open government (including open data and bid data) that are underpinned by strong political commitments of elected leaders. Though beyond the scope of this paper to provide any sort of objective and detailed assessment of the British Government, it does bear noting that in what many regard as the most privacy-sensitive public service domain of health care, in comparison to Canada, the UK has taken some notable steps in rebalancing individual privacy and the pursuit of collective societal innovation in this space (Callaway, 2013). We can postulate that the relatively higher level of political literacy on display in that country in recent years is an important variable in enabling action of this sort and the required public understanding and support.

While health care falls predominantly within provincial jurisdiction in Canada, the wider relevance of this observation remains. The single initiative undertaken by the

legislative branch of the Canadian Parliament in the realm of open data, for instance, led to political gridlock and traditional stances around privacy issues based upon partisan perspectives, and Canadian Governmental action in terms of data surveillance for security purposes remains shielded from political oversight in a much more substantive manner than in most other democratic countries (Roy, 2015). The sharply critical stances of independent oversight bodies, notably the federal Information and Privacy Commissioners, further reinforce the adversarial (rather than more open and collaborative conditions conducive to more open and inclusive governance) nature of Westminster politics. In such an environment, information is more likely to be viewed and processed as proprietary by political and administrative actors – and big data capacities are more likely to evolve in a more technocratic manner as a result.

In sum, despite the inclusion of dialogue as one of three dimensions in the Government of Canada's Open Government Action Plan, not only is this dialogue stunted by weak capacities within the executive branch (as discussed), but fractious political institutions and a relatively disengaged citizenry further reduce the scope for meaningful and discursive public engagement that, in turn, drive innovation both within and across government on the one hand, and within and across the economy and society on the other hand.

5   Toward Open and Innovative Democratic Governance

The over-riding lesson from the preceding analysis is that positive linkages between data, dialogue and innovation are not likely to emerge organically within a traditional democratic and governmental apparatus such as Canada's Westminster's Parliamentary regime. In fact, the risks are considerable that the tensions and frictions between traditional government and open government could not only constrain innovation within the public sector but also heighten cynicism and distrust amongst the citizenry at large. Underscoring this latter point are heightened signs of voter apathy and distrust in Canada and elsewhere, a point further reinforced by a recent public opinion survey of Americans probing them as the impacts of open government initiatives on governmental performance and trust (PEW, 2015).

What, then, must change, if governments are to devise meaningful governance capacities to leverage the benefits of open data and big data for greater innovation both internally and across society? Essentially, four inter-related governance architectures of the public sector must be transformed, including: the organizational, the technological, the political, and the societal. We examine each in turn, drawing upon preceding examples and discussion in order to highlight the Government of Canada's shortcomings in each realm and the sorts of reforms required going forward.

First, with respect to organizational architecture, as exemplified by the Treasury Board of the Government of Canada, traditional structures of executive branch government (predicated more on principles and policies of closed government than open government) are poorly suited to the pursuit of systemic openness and innovation. With respect to open data and big data specifically, the Province of British Columbia example provides recognition of this point, while a likeminded

British observer calls for the creation of a new 'Advanced Analytics Team' within Cabinet Office to champion novel cross-governmental approaches and new governance mechanisms to enable collaborative innovation (Yiu, 2012).

It bears noting here that the private sector firms driving data accumulation and processing (social media companies, cloud computing and data-mining experts etc.) are doing so through entirely new organizational structures – and many data advocates are unrealistically calling for governments to embrace similar mindsets and techniques (or instead to readily partner within them in doing so). The challenge for government is much more complex and lies in creating new spaces for innovation and experimentation within deeply embedded structures, most of which have been predicated limited openness and strong degrees of hierarchical control. The example noted above of virtual experimentation platforms is a case in point, necessitating the creation of new outward governance capacities for data sharing and public engagement. Discursive and participative forms of innovation will otherwise be stymied.

Secondly, in terms of technological architecture, an excessive reliance on proprietary hardware and software systems reinforces the traditionalism of government and further reinforces resistance to systemic openness and what some have term to be the fostering of 'open source democracy' (Kostakis, 2011; Maier-Rubler and Huber, 2011; Harrison et al., 2012; Roy, 2013a/b). Echoing more recent calls for more open source government by former White House Chief Technology Officer Beth Noveck, the 2011 British Parliamentary report invokes openness of technology solutions as a basis for wider forms of participative value creation and innovation:

> *We see a clear opportunity for Government to adopt this model. IT enabled public services should be provided on an open platform with open interfaces. Government should provide the necessary open infrastructure that empowers people inside and outside of Government to innovate (p.47, Public Administration Committee 2011).*

There is evidence of the UK government having embraced such a model and mindset in its most recent reforms (Fishenden and Johnson, 2014). Conversely, the Government of Canada has pursued its own digital refurbishment in largely the same sort of predominantly proprietary mindset discredited by the 2011 British review (Roy, 2013b). The result is a reinforcement of traditionalism across the technological and organizational apparatuses that invariably constrain the Government of Canada's Open Government Action Plan ability to foster more systemic governance openness.

Thirdly, a new political architecture is required in order to meaningfully embrace the centrality of dialogue and new forms of public engagement as the linchpin between data and innovation, rather than mere recognition of its importance as is the case within the Government of Canada model at present. In their quest for ubiquitous engagement within the US federal government, for example, Lee and Kwak underline the importance of 'creating and nurturing a self-sustaining ecosystem for public engagement is an important touchstone of open government efforts (p.25, Lee and Kwak, 2011). In an effort to create such an eco-system, the Obama Administration thus created a new office of public engagement in 2009 commiserate with this novel and outward facing functionality (Mergel, 2012). The UK example is once again

illuminating, at least in so far as the legislative branch of the British Parliament has recognized their own incapacities for digital dialogue with the public at large and in calling for deep-rooted reforms to address this deficiency (Speaker's Commission on Digital Democracy, 2015). The resulting recommendation for a new space within Parliamentary to formally house public deliberations and integrate them within the workings of Parliament (among other proposals) provides an example of how democratic and political innovations are intertwined.

Perhaps nowhere is the need for public engagement and dialogue more pronounced than on matters of privacy and redefining the balance between autonomy and openness, a debate viewed as either precarious or polarizing across large segments of populations. New forms of citizen involvement and oversight are thus essential for governments to pursue and realize the benefits of big data on the one hand, and to ensure democratic accountability and facilitate collective learning on the other hand. To quote from the New South Wales Information Commissioner in Australia, 'the increasingly digital environment requires greater coordination and oversight to ensure maximized civic engagement and public trust in the management of government information (p.54, Tydd, 2014).

Fourthly, and finally, the intertwined objectives of digital and data inclusiveness must be embraced as a social, political and economic objective for a jurisdiction such as Canada – or instead, a widening of existing digital divides is certain to follow. As we have seen with the Government of Canada's apps competition (following many similar examples of other jurisdictions in Canada and elsewhere), mobile devices are viewed as a critical enabler of citizen involvement with data resources and how such resources can be leveraged for public interest pursuits. In the UK more broadly, mobility has been viewed as a key platform to stimulate online usage of government resources for those otherwise disenfranchised groups that have thus far shunned or been unable to partake in online processes (Roy, 2014). On the other hand, Benton provides a more sceptical tone of mobility in this regard and the ability of smart phone usage to lessen what are already significant digital divides:

> *A final facet of the digital divide is that of smart-phones – which minorities and disadvantaged groups are more likely to rely on as their main method of accessing the Internet – often display an inferior version of full websites, and thus may provide a second-class form of Internet access. In seeking to capitalize on the opportunities that smart phones offer, policy-makers have to walk a fine line between improving access among those who would not otherwise have a line to city services and perpetuating a two-tiered system (p.11, Benton 2014).*

Geographic cleavages between urban and rural dwellings also present an important challenge to more inclusive governance. This quote's focus is that of so-called smart cities, where technological innovation and social diversity tend to be most intense. Indeed within the Canadian context, open data initiatives and big data companies tend to be most highly concentrated in large city centres, risking a further alienation of rural and remote communities – many continuing to struggle with affordable and reliable high speed Internet access in broadband or mobile form (Roy, 2014). Such cleavages risk greater divides and exclusion as Morozov warns: 'algorithmic regulation, whatever its immediate benefits, will give us a political regime where

technology corporations and government bureaucrats call all the shots' (p.11, Morozov, 2014). Despite a fair bit of evidence to suggests that most democratic governments are well-intended in promoting open government as a means to greater participation and inclusion – and to civic and social innovation along with economic innovation, there are legitimate questions about whether the capacities for such an agenda are developing in concert with an otherwise predominantly commercializing and individualizing online culture.

6 Conclusion

On the one hand, incentivized in part by the general evolution of the Internet era and the internationalizing agenda of many countries (especially those of the OECD), the Government of Canada has sought to develop an Open Government Action Plan predicated upon three main dimensions: information, data, and dialogue. A number of specific initiatives have been devised, most especially in the realm of data, notably the creation of an open data portal and an annual hackathon event to encourage innovation through the wider sharing and usage of such data holdings for economic and social purposes. On the other hand, an information management regime steeped in historical tendencies toward selective and reactive transparency, as well as a stated focus on public dialogue that runs fundamentally counter to the control-laden, bureaucratic structures and culture of a Westminster-stylized machinery of government render such an action plan problematic in many respects.

The Government of Canada is arguably emblematic of the wider struggles of the public sector generally, in much of the world, to reconcile the tensions between traditionalism and reform embedded within the evolution of an open government (Ubaldi, 2013). This article has argued that in resolving such tensions, governments must develop new governance architectures organizationally, technologically, politically, and socially. As is the case in Canada (especially if one adds consideration of provincial and municipal efforts excluded from the analysis of this article), as well as in other jurisdictions, notably the US and the UK, governments are beginning to experiment to varying degrees within and across each of these realms.

One over-riding conclusion from this analysis is the growing need for inter-disciplinary endeavours within as well as outside of government. Within the public sector, to draw from the Government of Canada example, the three inter-related dimensions of information, data and dialogue all stem from highly differentiated traditions and skill sets, even as they must be increasingly integrated going forward. Similarly, if government is to orchestrate a societal focus on big data and shared innovation, creating multi-stakeholder venues welcoming of varying disciplines and perspectives is of paramount importance. Creating a collectivized and openly discursive forum for risk management, for example, in order to identify and mitigate the unintended consequences of big data in proactive and reactive manners, can both bring new competencies into government and widen public learning and trust (Quigley and Roy, 2011).

With respect to promising future research directions, more investigation is required into the specific determinants of innovation through data-driven efforts and how such

efforts are shaped by the various types of architectures identified in the preceding discussion (i.e., organizational, technological, political, and social). As more and more governments experiment with alternative governance arrangements to pursue data-driven innovation and open government, comparative case studies can provide further illumination in this regard. It is also of paramount importance for governments and researchers alike (separately and via new partnerships) further study how open data sources are being accessed and if and how they are shaping big data systems (and, in turn, how these systems are being utilized and to what end). Additionally, the attitudes and mindsets of elected officials and senior public servants are invariably key determinants in shaping or constraining any public sector reform agenda, and more study is required here in order to expose and understand social, managerial, demographic and political cleavages at play in developing and overseeing open government going forward.

In sum, open government has been embraced with remarkable speed by jurisdictions around the world, viewed by many as a pathway to not only greater public understanding and accountability but also systemic innovation both within the public sector and across increasingly digitized and networked societies. Yet the realization of public value remains in its infancy, constrained in many respects by inward democratic governance regimes. In the case of the Government of Canada, the rhetorical foundations for breaking free from this inertia are at least partially established, whereas the constructing of new realities remains very much a work in progress.

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