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The Progression of Open Data Initiatives in Canadian Municipalities: The Evolution of E-Government Services and Its Relationship to an Emerging Movement

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The Progression of Open Data Initiatives in Canadian Municipalities:
The Evolution of e-Government Services and its Relationship to an Emerging
Movement.

Abstract:

The emergence of e-governance and the gov 2.0 era have presented governments, especially local governments with the opportunity to enhance: the dissemination of information to, develop measures of accountability and transparency for, and the engagement of, its citizens. However, as a survey of academic literature written on e-governance has shown, senior municipal administrators and officials have resisted outward changes, preferring to limit initiatives to projects that enhance internal technological capacity, and do not threaten existing jobs. However, a new movement has emerged designed to improve on the three areas above, known as open data. This paper examines the rationale for developing open data programs by conducting interviews with officials from six Canadian municipalities involved in open data projects, and two citizens who have also played an important role. What the author discovered is that there is a mix of citizens and municipal officials who have a great desire to release datasets. However, two years after the first open data catalogue was released by a Canadian municipality, the movement has progressed slowly, and has several areas on which to improve.

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Chapter 1: Introduction

The ability of municipal governments to transmit vital information to citizens has dramatically increased with the development of the internet, and has continued to evolve over the past two decades. However, much of the content delivered by municipal organisations to its citizens over the internet is limited, and is designed to inform citizens rather than to engage them. A recent development in the evolution of the internet is known as the "gov 2.0" era, which is intended to increase the ability of citizens to interact with their government through technological means. An element of the gov 2.0 era that has developed over the past two to three years is the open data movement. Open data is designed to encourage the use of government data that is currently used for internal purposes only, but could be utilised externally by citizens and web developers to create applications that are intended to create a more accessible, open, and transparent government.

Open data refers to distribution of raw datasets that are freely provided to individual citizens, and can consist of any series of information, but typically include excel spreadsheets or mapping sets. In turn, citizens can develop the data into applications or visualisation tools designed to broaden the appeal and understanding of the data. For example, by releasing budget or financial information, a developer could input the data into a computer application to create a database where citizens could search the spending of various departments and compare, or "mashup" that data to another municipal departments figures to understand how their

government spends its tax revenue. As well, data from a police service could be overlaid on a map to create a visualisation that defines where accidents have occurred, with the intention of understanding where safety improvements should be made. Essentially, what open data affords to citizens and municipal organisations is the opportunity to operate more efficiently, and to enhance the decision making process by utilising data over perception.

Governments around the world have developed open data catalogues, where their individual datasets are available for use by citizens. In the context of Canadian local governments, currently ten municipalities have established catalogues. For the purposes of this paper, six of the ten have been selected to be examined to analysis the progression of open data in Canadian municipalities, and to determine the successes and failures that the six have dealt with throughout their processes of collecting and releasing datasets.

The six municipalities vary in population size from the City of Ottawa (812,129) to the City of Medicine Hat (56,997). Four municipalities are located in Western Canada (Nanaimo, Vancouver, Edmonton and Medicine Hat), with two in Ontario (Ottawa and London). The first municipality to release a data catalogue was the City of Nanaimo on June 22, 2009, with the most recent being the City of Medicine Hat on April 5, 2011.

This paper is one of the first academic attempts at examining the progression of the open data movement in Canadian municipalities, and to identify any common issues that have been encountered by the

organisations. Interviews were conducted with one official from each of the municipalities who were involved in the deployment of their municipalities' open data catalogue. Furthermore, two interviews were conducted with community members to identify the rationale to request for the release of datasets, and to provide a different perspective from that of municipal officials surrounding the open data movement in Canada as it currently exists.

Finally, this paper is not intended to be a concise presentation of the open data movement in Canadian municipalities. Each of the topics discussed in the research analysis were selected either because they a) were deemed to be central to the overall discussion, b) they were consistently spoke of in the interviews conducted, and c) they were of interest to the author's preconceived notions about e-government and open data.

Chapter 2: Literature Review

2.1 Introduction to Literature Review

While little has been written academically about the emergence of open data initiatives, they represent the most recent development in the e-governance and gov 2.0 eras, and as such can be discussed through their existing frameworks. The e-governance movement has become a factor in operational procedures that administrators and politicians cannot afford to ignore because at its core it is designed to provide an effective way to distribute information to citizens, and in many ways, provides an opportunity to develop greater transparency in government.

Much of the academic debate surrounding e-government solutions in the past decade have centred on the development of technology, and the desire of governments to embrace and properly implement the products available to them. The primary focus has surrounded the ability of technology to improve the delivery of government services, however in many aspects, the public sector is far behind the private sector when dealing with the adoption of technological solutions to their operations.

2.2 Government 2.0, e-Government and Open Data

The emergence of the digital age has created a new operating reality for organisations, especially municipalities. The use of technology in municipalities has been an interesting dichotomy, as they must appease previous methods of delivering information to citizens, while augmenting traditional means with the electronic connection younger citizens desire.

The movement known as "Government 2.0" or "gov 2.0" has gained

increasing support since the theoretical description of the Web 2.0 era was

developed in 2003, and has spurred several subsets. The most recent

development in the gov 2.0 effort has been the establishment of practices

by governments where they release their existing datasets in open formats

(Excel, Shapefile) to citizens, who transform the data into usable

applications and visualisation tools. Governments around the world,

including the Obama administration and several Canadian municipalities

have embraced the open data movement. John Morison in a 2010 article

stated that the open data movement

"is not simply another big government IT project, but rather an application of the next evolution of the World Wide Web into the Semantic Web where the development of linked data allows users to make connections based on the meaning of information rather than simply connecting to other documents."[1]

This quote effectively summarises the potential of open data. The

ability to link, and to retrieve massive quantities of data can dramatically

alter the standard operating procedures employed by the public service.

Furthermore, the increased movement of information within a government

organisation can create operational efficiencies by providing more accurate

information with greater detail, for public servants to formulate appropriate

public policy decisions.

2.3 Progression of e-Government services

The development of the e-government movement was theorised by M.

Jae Moon in a 2001 article, in which he described five distinct stages of e-

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[1]   John Morison, "Gov 2.0: Towards a User Generated State?" *Modern Law Review* 73 no. 4 (2010); 562-563.

government adoption that would ultimately culminate in the development of political participation based on technological means.[2] While the four initial areas of e-government developed based on Moon's theoretical explanation, (one-way communication, two-way communication, service and financial transactions, and horizontal and vertical integration) the process of political participation has differed. Moon's concept envisioned a tightly controlled system of participation where citizens would be able to vote online, and citizens would be able to comment on and engage in the legislative process, but would require the development of "highly sophisticated security [and] encryption... to support online political participation."[3] However, as we have seen with the advent of social media platforms such as Twitter and Facebook, the security features Moon spoke of have been outsourced to external platforms, and have begun to alter the nature of participation.

As such, the same process of social media participation could be applied to the open data movement, as the onus of developing digital platforms has shifted from government organisations to external sources. The evolution of e-government services and citizen participation have been greatly influenced by market forces, and the methods citizens utilise to operate in their daily lives. As technology increasingly becomes a necessity rather than a luxury for social interaction and human comprehension, government organisations will have to understand and adapt to the societal

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[2]   M. Jae Moon, "The Evolution of E-Government Among Municipalities," *Public Administration Review* 62 no. 4 (2001): 426.
[3]   Moon, 428.

change that is occurring.[4] Open data is simply an extension of the methods

that citizens desire to employ to receive information, to become politically

active, and to gain the ability to derive their own conclusions from data

without having to rely on the views of politicians or public servants.

2.4 Issues in Municipal Governments

However, the pace of technological integration in government sectors

has lagged, and many believe that it is due to the reluctance of government

officials, both administratively and politically to incorporate digital tools into

their operations.[5] Furthermore, there has been an "insufficient appreciation"

towards the use of emerging technologies, and the ever present

competition for resources in the public sector.[6] While the article mentioned

above was written in 2003, these statements still hold true nearly a decade

later. Public sector organizations, especially municipal governments have

difficulty defining and implementing their digital priorities. Municipal

websites are often confusing, devoid of natural fluidity, and some

developed nearly ten to 15 years ago. Overall, local governments have not

effectively utilised the tools available to them to disseminate information to

the public, and still rely heavily on traditional mediums (newspapers, mail

outs). The use of e-governance practices by municipalities hold great

promise, but have thus far, fallen short of their promise.

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[4]   Vassilis Meneklis and Christos Douligeris, "Bridging Theory and Practice in E-Government: A Set of Guidelines for Architectural Design," *Government Information Quarterly* 27 no. 1 (2010), 75.

[5]   Fanie Cloete, "Assessing Government with Electronic Policy Management Tools," *Public Performance & Management Review,* 26 (2003): 288.

[6]   Cloete.

2.5 Current State of e-Government Services

Gov 2.0 and open data are particularly important for local governments because of the vast assortment of services they provide, and the somewhat archaic information delivery systems that are still employed. What the open data movement can do is to efficiently disseminate information from a local government to a citizen with the click of a mouse, while still providing the same information through traditional mediums. However, the gov 2.0 movement has not attracted the participation of the majority of smaller municipalities, as discovered by studies conducted by Tony Carrizales,[7] and a similar study conducted by Stephen Aikins and Dale Krane,[8] whose studies have focussed on smaller American municipal examples. In these studies the author's discovered that technological improvements are typically devoted solely to internal structures rather than external structures. As such, an area of focus for this paper will be what motivates larger Canadian municipalities to expand the realm of their technological improvements, with particular focus placed on their decision to release open data to the public.

While smaller municipalities may not have the capacity to initiate e-government programs, some of the greatest barriers to e-government in any sized organisation can come from municipal officials, many of whom view technology as a threat to job security and ultimately resist change

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[7]   Tony Carrizales, "Functions of E-Government: A Study of Municipal Practices," *State and Local Government Review* 40, no. 1 (2008): 12.
[8]   Stephen Kwamena Aikins and Dale Krane, "Are Public Officials Obstacles to Citizen-Centred E-Government? An examination of Municipal Administrators' Motivations and Actions," *State and Local Government Review* 42, no. 2 (2010): 93.

whenever possible.[9] A further element of the studies conducted by Carrizales, and Aikins and Krane was the desire of Chief Administrative Officers (or) City Managers to implement elements of e-government. Both studies concluded that senior managers have not adopted technologically based means to connect with citizens because they prefer traditional methods of communication,[10] and that they do not believe in the merits of e-government for participation purposes.[11]

2.6 e-Government Services and Citizens

One of the greatest issues with e-government development over the past decade is that is has not focussed enough attention to the desires of citizens, and as such, many programs have been under utilised, and thus do not succeed.[12] The open data movement presents an opportunity for governments to alter the course of their technological engagement policies as it is one of the few, if not the only e-government initiative that lends itself to involving citizens from the onset to encourage high usage.

While e-government has not reach a point of complete integration, it will continue to succeed through the gains made by those willing to invest, and innovate certain uses. Those who with a high propensity to have trust in their government or utilise technological services are more likely to agree

9   Richard Schwester, "Examining the Barriers to e-Government Adoption." *Electronic Journal of e*-Government 7, no. 1 (2009): 116.
10   Aikins and Krane, 94.
11   Carrizales, 22.
12   Lex van Velsen, Thea van der Geest, Marc ter Hedde, and Wijnand Derks, "Requirements engineering for e-Government services: A citizen-centric approach and case study," Government Information Quarterly 26 no. 2 (2009): 477.

with the development of e-government initiatives.[13] As such, municipalities should foster the ambitions of the citizens who want to engage in discussions about the functions of their local governments, with open data providing the opportunity to bring discussions to as many as possible. Furthermore, the release of datasets encourages citizen involvement in matters related to the municipality. With voter turnout rates for municipal elections far lower than rates for provincial and federal elections, municipalities more than ever need to consider how to properly engage their citizens.

2.7 e-Government and Transparency

According to Tony Carrizales, e-governance should aim "to enhance [the] access and delivery of government services to benefit citizens while strengthening government's drive towards effective governance and increased transparency."[14] This sentiment is shared by the Obama administration, who have pushed for the release of open datasets,[15][16] and have established a website to host them, data.gov. As well, Obama named Vivek Kundra as the first federal Chief Information Officer (CIO) of the United States of America in March 2009, with the stated role of "making sure [the federal government] is running in the most secure, open, and

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13   Simon Horsburgh, Shaun Goldfinch, and Robin Gauld, "Is Public Trust in Government Associated With Trust in E-Government*?" Social Science Computer Review* 29 no. 2 (2011): 233.

14   Carrizales, 12.

15   Transparency and Open Government, January 21, 2009. http://www.whitehouse.gov/the_press_office/Transparency_and_Open_Government/

16   Transparency and Open Government, December 8, 2009. http://www.whitehouse.gov/sites/default/files/omb/assets/memoranda_2010/m10-06.pdf

efficient way possible."[17] While non-governmental organisations such as the Organisation for Economic Co-Operation and Development stress the importance of reporting of financial statements through e-government services as a means to provide a measure of transparency,[18] a study of local governments in Europe conducted in 2006 reported that fewer than 40 percent utilise these services.[19] As such, any initiative that serves to enact accountability measures on government institutions should be seriously considered by municipalities.

The direction taken by the White House is indicative of the future use of technology by governments. By releasing open datasets to the public, municipal organizations can exhibit to citizens that they are undertaking measures to improve their transparency, as it has been a major criticism of their operations.

2.8 Conclusions and the Future of e-Government with Open Data

The possibilities of transforming open datasets into usable applications are endless. Datasets can be turned into web-based applications, viewable through a web browser, or can be developed into smartphone applications. In the past two years, several municipalities in North America have encouraged the development of smartphone applications to aid city services, and the private sector has been an

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[17]   President Obama Names Vivek Kundra Chief Information Officer, March 5, 2009. http://www.whitehouse.gov/the_press_office/President-Obama-Names-Vivek-Kundra-Chief-Information-Officer/

[18]   Vicente Pina, Lourdes Torres And Sonia Royo, "Is E-Government Leading to More Accountable and Transparent Local Governments? An Overall View" *Financial Accountability and Management* 26 no. 1 (2010): 4.

[19]   Pina, Torres and Royo, 10.

important partner in these developments. A further sign that the e-governance and open data movement is gaining traction has been the competition established by the City of Ottawa to develop applications based on its open data catalogue.[20] The contest offered $50,000 in total prizes to spur application development, and received approximately 100 submissions ranging from bus services to winter parking restrictions.[21]

These applications can be the future of how governments will interact with their citizens. The current situation shows that large municipal and federal governments are getting involved, but the benefits are not exclusive to them. Smaller municipalities could very easily utilise these applications, which could be developed by the public, internally, or through a private contractor.

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[20]   http://www.apps4ottawa.ca/
[21]   http://apps4ottawa.ca/en/ideas

Chapter 3: Methodology

3.1 Introduction to Methodology

The main method employed to collect research for this paper was to conduct personal interviews with municipal officials and relevant community members associated with the Open Data movement. In all, six officials from six municipalities ranging from a Chief Administrative Officer, to managing directors were asked a pre-determined set of questions designed to understand the progression of each municipality's open data movement, collect insight into the rationale for releasing datasets, and to determine the issues each organisation faced. To contrast the views of municipal officials, two community members involved in the open data movement were interviewed to determine the motivations of citizens to petition their local governments to release datasets, to compare their perceptions of how open data projects were established in their associated municipalities, and to identify the issues they felt there are presently with the movement.

3.2 Municipal Officials

Municipality	Name of Official	Position
City of Vancouver	Jonathan Mark	Manager, GIS
City of Edmonton	Ashley Casovan	Strategic Coordinator, Office of the Chief Information Officer

City of Ottawa	Guy Michaud	Chief Information Officer
City of London	Elaine Gamble	Director, Corporate Communications
City of Nanaimo	Guillermo Ferrero	Business Applications and ERP Systems
City of Medicine Hat	Ray Barnard	Chief Administrative Officer

The six municipalities listed above were chosen because they represent a cross-section of Canadian municipalities that have released open datasets. The City of Nanaimo was the first municipality in Canadian to release a data catalogue in June 2009 and is one of the smallest, along with the City of Medicine Hat, who is the latest municipality to release a data catalogue, and the smallest with a population of 56,997. The City's of Edmonton, Ottawa and Vancouver were chosen because they have taken proactive approaches to their open data programs. Finally, the City of London was selected for its proximity to The University of Western Ontario, and its relativity stagnant activity in open data since releasing its catalogue in September 2010. These municipalities account for nearly half of the local governments in Canada who have released a data catalogue, and the variance in their size provide the opportunity to examine the largest, and smallest municipalities who have developed open data initiatives.

Each of the local government interviewees were asked a series of ten questions to provide a uniform examination of the progression of open data in each of the municipal organisations.

1. What was your initial reaction when you were told of open data?
2. How did you discover/who told you about open data?
3. Who initiated the release of open data in your municipality? (Administrators or a community group?)
4. What were the main reasons for releasing datasets?
5. What were some of the concerns voiced by the administration?
6. What was the view of your CAO?
7. What was the role of the community? (Drivers, did they utilize, ignore?) How do you view the community's response to open data?
8. From a local government standpoint, what do you believe are the positives, and negatives of open data?
• Positives:
• Negatives:
9. Have you considered/are you considering ingraining open data file formats into your standard operating procedures?
10. Where do you believe open data will be in the next year? Five years?

These questions were designed to elicit the views of municipal administrators towards open data, to identify some of the most prevalent issues that arose during the initial discussions surrounding releasing datasets, the role of community members, and to understand how different administrators have viewed the progression of open data in their organisation. Each respondent aside from Ray Barnard (due to his role as the CAO for the City of Medicine Hat) answered every question. The author recognises the inherent challenge of asking for individual viewpoints on their municipality's experience with open data. Some respondents are managing directors of the department responsible for open data programs, and may have been provided with a broader view of the projects than others. Furthermore, it can be difficult to induce the true opinions of

municipal officials through personal interviews, and as such, this was considered during the research analysis.

3.3 Community Members

In an attempt to balance the views of municipal officials, and to provide further insight into the open data movement, two community members were interviewed to gauge the rationale for community support and pressure to release municipal datasets.

Name	Associated Municipality
David Eaves	Vancouver
Aaron McGowan	London

Both respondents were asked seven questions listed below, which were designed to understand the desire of community members to have municipal datasets released, how they perceived the reaction of the municipality towards their requests, and to extract their viewpoints towards the progression of open data in Canadian municipalities thus far.

1. What sparked your interest in open data?
2. Who initiated the release of open data in your municipality? (E.g. Municipality, Community group).
3. If community initiated, what was the initial response from the municipality? Who *[name and position]* handled the issue in the municipal organization?
4. Who has lead in respect to the release of datasets in the municipal organization? Community?
5. Who has resisted the release of datasets in the municipal organization? Community?
6. Has the data been effectively utilised?
7. Where do you believe open data will be in the next year? Five years?

Chapter 4: Research Analysis

4.1 Introduction to Analysis

The insights of municipal administrators were key to understanding why certain Canadian local governments have developed open data catalogues, and what has been done to sustain them. The first question municipal officials were asked was "What was your initial reaction when you were told of open data?" Each of the respondents were aware of the general principles of open data before it was introduced as a possible initiative in their organisation, and understood its usage by other government institutions. Therefore, knowledge of open data principles could be a determining factor in accounting for the implementation of an open data project in Canadian municipalities. Furthermore, each of the respondents held the view that their open data effort would continue to increase in the next year, although some were more optimistic than others.

An interesting, but unsurprising trend was that five of the six open data projects studied are overseen by information technology (IT) departments (or an equivalent in duty), while the City of London's project is being directed by the Corporate Communications department. While it would appear that IT departments would be the logical choice to implement technologically based projects, an organisational-wide approach is ultimately necessary to develop a truly representative data catalogue. However, respondents did indicate that there are some sources of resistance by senior administrators, particularly by those who do not see the value in releasing data, or by those who do not want to open their

departments up to increased scrutiny. While resistance has occurred, the majority of interviewees responded that the movement has, at least on the surface, received support from the administrative leadership of their organisation.

After evaluating the research conducted, it was determined that four of the six municipalities (Edmonton, Ottawa, Vancouver and Nanaimo) are operating at a more evolved and proactive process than the remaining two (London and Medicine Hat), who either remain relativity reactive in their approach, or do not have the resources (personal or fiscal) to fully develop an appropriate open data structure.

4.2 Project Initiation

One of the most interesting questions that was answered through the research process related to the initiation of open data catalogues. The majority of respondents indicated that much of the interest in open data stemmed from both computer programmers who desired to utilise data to develop applications, and from open government advocates, who viewed it as a means to further the transparency of government through the ability to analyse its raw data. Furthermore, half of the six municipalities (London, Vancouver and Edmonton) began the process of releasing datasets after requests from citizens that they do so. Two of the remaining three municipalities (Nanaimo and Ottawa) began their processes not from the top-down, but rather from more of a middle-up dialogue between mid-ranking employees and department managers, and their immediate supervisors (CIOs). Only Medicine Hat followed a truly top-down method,

whereas CAO Ray Barnard instructed Information and Communication Systems (ICS) employees to investigate, and implement an open data catalogue.[22]

The most interesting finding from this section is that mid-level employees seem to have an ability to impact policy directions related to open data and open government. While only two of the six respondents indicated that their municipality's open data programs were developed from the "middle-up," it is significant because the success of these programs are dependent on support from senior management, and through inter-departmental cooperation. Furthermore, this funding showed that there is some support for the 'flattening' of organisational structures, and that the ability to embrace ideas that do not originate solely from the senior management team is present in certain municipalities in Canada. This is particularly true when combined with the municipalities who released due to community pressure.

While community members were an integral element of the movement to release open datasets, they did not play as large of a role as the author had anticipated. As one of the major intended outcomes of releasing datasets is to facilitate usage by the community to develop applications, it was assumed that the community would have been more significantly involved in the process. Although, in a matter that will discussed further in the research analysis, it was discovered that the municipalities that have developed more robust open data projects are

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[22]   Ray Barnard (City of Medicine Hat) in discussion with the author, July 4, 2011.

those who have had a proactive role in promoting the usage of datasets and the development of applications, while working in cooperation with the community.

4.3 Why release?

There were several motivating factors identified by both municipal officials and community members for their desire to have datasets released by municipal organisations. A common theme amongst the respondents was that they believed that open data has the ability to develop more open and transparent operations, both externally, and internally. The main rationale behind this theme is that open data, and open government have the potential to increase the efficacy of citizens by exhibiting to them that they are trusted partners in the relationship between local governments and themselves. It accomplishes this by involving citizens in both the development of applications for common uses, and by releasing as much information about the operations of a municipal organisation as possible.

An interesting point that emerged from the research process is that many municipalities are currently practicing elements of open data, even if they do not realise it, or are not distributing it through accessible means. The main process of releasing open datasets for the City of Nanaimo involved collecting datasets that were being released by the municipality, as explained by the City's Manager of Business Applications and ERP Systems Guillermo Ferrero.[23] Initially, Nanaimo's catalogue was populated solely by datasets that were already being given to citizens "over the

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[23]   Guillermo Ferrero (City of Nanaimo) in discussion with the author, June 9, 2011.

counter," such as the location of utilities and a database of business licences.[24] While the data was available to citizens, a typical request took approximately two weeks to process, and involved outputting the data onto a compact disc that had to be delivered or picked up by the individual requesting it.[25]

By converting the inefficient system of data transmission to a web-based catalogue, citizens are now able to download datasets on-demand, which contain data that is refreshed daily. Furthermore, the established system does not require an employee to complete the request, which presents the potential to develop further operational efficiencies. This situation was not unique to Nanaimo, as Vancouver had been established a similar practice, although executed in a different way.

A key component of open data is mapping, and Geographical Information Systems (GIS) are responsible for majority of the datasets in the City of Vancouver's catalogue. Jonathan Mark, the City's GIS Manager has been a longtime proponent of the ideas that compromise the modern open data movement. According to Mark, the notion that the City's data could be effectively utilised for uses other than by the municipal organisation was not a revelation, as his department had been licencing it's data for a number of years, and he had repeatedly called for it to be released freely to the public.[26] As such, Mark and the GIS department were

24   Guillermo Ferrero (City of Nanaimo) in discussion with the author, June 9, 2011.
25   Guillermo Ferrero (City of Nanaimo) in discussion with the author, June 9, 2011.
26   Jonathan Mark (City of Vancouver) in discussion with the author, June 24, 2011.

tasked with the development of the City's open data catalogue, nearly 90 percent of which is comprised of GIS datasets.

4.4 Organisational Goals

The improvements to organisational efficiencies that can be made through open data are exhibited by the City of Ottawa's open data program, and the philosophy behind it. According to the City's Chief Information Officer (CIO) Guy Michaud, their program is punctuated by the corporation's desire to develop efficient methods when and wherever possible.[27] The City of Ottawa has been extremely proactive towards their open data initiative, and in June 2011 appointed Robert Giggey to head their permanent open data program. According to Guy Michaud, the City believes that it was important strategic move to ensure open data and open government principles are entrenched in their methods of doing business, and required an individual who is responsible for making it happen in order for it to be successful.[28] While only one position has been created that will have its sole focus on open data, it will be an important experiment to understand if open data will be able to imbed itself into the standard operating procedures of the City of Ottawa, with the desired outcome of improving service deliver to citizens, and creating a more efficient operating environment for their employees.[29]

The main difference between municipalities and their approach to open data initiatives is the extent of how the projects have been handled,

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[27] Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011.
[28] Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011.
[29] Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011.

and how they have been envisioned to continue in the future. Four of the subject municipalities (Vancouver, Nanaimo, Ottawa and Edmonton) in the author's opinion have progressed to a level where open data is now considered to be an integral part of their operations, and is it no longer viewed as a one-time project to satisfy the requests of the community. The ability of open data to embrace aspects of open government, and to improve the internal and external transmission of vital information have been the deciding factors for the municipal organisations[30] that have adopted open data catalogues, and these factors have ultimately outweighed the issues inherit in the movement that will be discussed below.

4.5 Municipal Issues

The most significant hurdles to open data adoption by Canadian municipalities tend to surround issues of privacy and liability, and a lack of resources, both personnel and fiscal, to properly establish the necessary conditions for open data to succeed. Each of the respondents indicated that one or more of these issues were present in the discussions held prior to the adoption of open data practices, or throughout the implementation. It was determined through the research process that while these issues can be omnipresent, the municipal organisations that have mitigated these issues have developed the most successful open data programs, and that these issues should not deter municipalities from adopting open data practices.

4.5.1 Privacy and Liability

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[30]   Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011 and Ashley Casovan (City of Edmonton), in discussion with the author, June 23, 2011.

One of the main concerns that were presented to administrators of open data were issues related to privacy and liability. While these concerns were present in a majority of organisation, they did not appear to be an issue with those charged with initiating the programs, as they indicated that their understanding of open data allayed any worries they had surrounding the releasing of data. Furthermore, the respondents indicated that the concerns surrounding privacy and liability were addressed through a number of methods, and that they do not continue to be issues as the programs have progressed. The main process utilised by municipalities to ensure that private information was not transmitted by the datasets was to rely on provincial freedom of information and protection of privacy standards. The majority of respondents indicated that the departments responsible for freedom of information requests subjected datasets to the same protocols that are utilised for traditional mediums to ensure that they met legislative standards.

The most common method that is intended to negate any issues of liability is the open data licence, or terms of use that is employed by each of the municipalities. In fact, five of the six (Nanaimo excluded) utilise the same licence with only minor variations. Essentially each licence indicates that the municipality will provide the data royalty free, but will not provide a guarantee that is it accurate, and will not allow users to associate their applications with the municipality. This point was further explained by Guy Michaud, CIO for the City of Ottawa who stated that providing accurate data is a primary focus of the City's program, but that they cannot be

expected to be held liable should it not be accurate.[31] To date, there have

not been any issues associated with privacy and liability, and the licence

has been sufficient. Although Ashley Casovan of the City of Edmonton

indicated in her interview that a new licence is in development that will

attempt to standardise the licence for use by both municipal and provincial

governments.[32] Furthermore, Ray Barnard of the City of Medicine Hat

indicated that these issues should not deter municipalities from developing

open data catalogues, noting that so long as they are not "reckless" in their

approach, they should encounter few problems.[33]

4.5.2 Personal and Fiscal Resources

One of the main impediments to the success of open data catalogues

has been a lack of resources available to be devoted to projects, to both

collect datasets and sustain initial growth. Of the six municipalities, only two

(Ottawa and Edmonton) have staff whose duties are solely dedicated to

their open data program.[34] Furthermore, most municipalities have not

provided any permanent funding to their open data programs, which can

provide the perception that it is nothing more than a one-time project.

These conditions have limited the ability of departments to fully invest in the

tools that are necessary for open data to flourish.

According the author's research there is a distinct variance in

progression of open data in the studied municipality based on personnel

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[31]   Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011.
[32]   Ashley Casovan (City of Edmonton), in discussion with the author, June 23, 2011.
[33]   Ray Barnard (City of Medicine Hat) in discussion with the author, July 4, 2011.
[34]   Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011 and
Ashley Casovan (City of Edmonton), in discussion with the author, June 23, 2011.

and fiscal resources. The Cities of Edmonton and Ottawa have mounted a tremendous effort towards open data, and have funded staff and the programs accordingly. The Cities of Nanaimo and Vancouver have not received as much in terms of dedicated resources, but have still produced a significant amount of datasets, especially when one considers the population of Nanaimo. The City of Medicine Hat relied on its ICS staff to launch its catalogue, however since it is still in the early stages of development it is difficult to assess how it will proceed.[35] However, the City of London has been actively releasing datasets for nearly one year, and has stalled due to recent funding restrictions and budget freezes.

The nature of open data programs have tended to be reactive during the initiation phase of the project, a point that was highlighted by Jonathan Mark, the GIS Manager for the City of Vancouver. He indicated that since the inception of their program approximately two years previous, his department had not received any additional funding, nor additional personnel to complete and maintain the open data catalogue.[36] Mark indicated that the open data program has enveloped a significant amount of his department's personal and fiscal resources, which is a consistence issue amongst municipalities. This forced him to delay planned and to alter his staffing commitments to existing projects in order to accommodate the increased workload. He further noted that funding has been made available for planning aspects of the open data program, but not to assist in

35   Ray Barnard (City of Medicine Hat) in discussion with the author, July 4, 2011.
36   Jonathan Mark (City of Vancouver) in discussion with the author, June 24, 2011.

developing the actual deliverables.[37] While it may appear logical to assume that there would be little cost involved in uploading datasets to a website, many of the sets have to be converted into usable open data file formats, vetted for personal information, and embedded with "scripts" to ensure that the information that is needed to be updated regularly could be done so automatically. One of the greatest misconceptions about open data appears to be that it would incur little to no cost to initiate and operate.

Another municipal organisation that has faced by a lack of resources is the City of London. The open data initiative for London has been an interesting and somewhat challenging task according to Elaine Gamble, Director of Corporate Communications, and the champion for the City's open data project.[38] The main issue for London has been the absence of dedicated personal and fiscal resources to operate the project as a viable and important initiative, and to progress from the initial reactive stage to a fully ingrained process. Furthermore, Gamble explained that the project has had to overcome some significant barriers, including a lack of organisational knowledge surrounding open data file formats to develop its data catalogue.[39] She believes that the open data initiative will "have to make its way into a list [of the City's organisational] priorities"[40] before it will have an impact on the organisations operating procedures.

4.6 Community and Citizen Stakeholders

37   Jonathan Mark (City of Vancouver) in discussion with the author, June 24, 2011.
38   Elaine Gamble (City of London) in discussion with the author, June 20, 2011.
39   Elaine Gamble (City of London) in discussion with the author, June 20, 2011.
40   Elaine Gamble (City of London) in discussion with the author, June 20, 2011.

While it was assumed that community members had a played a significant role in each of the municipal open data initiatives, this was only true in three (London, Edmonton and Vancouver) of the six case studies. However, the role the community played in each of the six municipalities cannot be understated. As such, two community members were interviewed during the research phase, who outlined how the open data process in certain situations was initiated by external actors rather than by municipal officials. Furthermore, while the community has played a lesser role in the additional four municipalities, they have played a pivotal role in developing open data initiatives, and in providing the impetuous for open data programs to evolve.

The two community actors interviewed for this study were David Eaves, who assisted in developing the council motion that would frame Vancouver's open data initiative, and Aaron McGowan, who has been involved in forwarding the cause of open data in London. Both were asked for the rationale behind their desire to have datasets released by their respective municipalities.

David Eaves responded that he is a "policy geek,"[41] who believed that data could be utilised to properly analyse public policy issues, and develop open government principles that would ultimately benefit both citizens and local government officials. As a proponent of open source software, Eaves felt that if the principles of open source software, which tend to include a non-proprietary source code that allows individuals to alter and improve

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[41]   David Eaves in discussion with the author, July 11, 2011.

existing programs, could be applied to the data created by governments it would ultimately lead to better public policy.[42] As such he felt that, open data has the potential to innovate on traditional methods of operating in the public sector.[43]

However, Eaves outlined some of the shortcomings of the initial open data initiatives. First, he believes that the data catalogues that have been released do not encourage usage outside of the local area, as there has not been a coordinated effort to standardise the data being released in order to appeal to a broader audience of developers.[44] While it can be argued that the movement is still in its infancy, the standardisation of both datasets and the open data licence should be the next important evolution. Secondly, he feels that the creation of applications as a measurement of success for open data initiatives is misguided. To Eaves, applications are secondary to the data they originate from, as the analysis of data to develop better public policy should be the ultimate goal.[45] However, the movement can be heavily dependent on developers to create proper uses from the data, and they have tended to focus more so on high demand and functional applications, such as transit applications.

For Aaron McGowan, the desire to develop applications from open datasets was born out of his skills as a software and web developer, and a frustration with inability of London Transit to effectively communicate bus information to its riders. In early 2010 he developed NextStopApp, which

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42   David Eaves in discussion with the author, July 11, 2011.
43   David Eaves in discussion with the author, July 11, 2011.
44   David Eaves in discussion with the author, July 11, 2011.
45   David Eaves in discussion with the author, July 11, 2011.

"scraped" the data provided by London Transit on its website into a mobile-friendly application viewable by various mobile operating systems.[46] According to McGowan, he developed NextStopApp as he frequently used London Transit, and understood that they had capacity to translate the data it collected into a useful product to assist and inform its cliental, but did not effectively utilise it.[47] Furthermore, they have repeatedly denied his requests to access their main application programming interface (API), which would allow him to develop an enhanced product. To summarise the development path of applications such as NextStopApp, Guy Michaud explained that he believes that municipalities must embrace open data because "otherwise people will do it anyways, whether through scraping tools," [48] or more malicious means.

Through the community organisation OpenData London, McGowan has also participated in a "hackathon" which resulted in the development of London Trash. London Trash is an application that converts the London garbage calendar, which runs on a somewhat confusing eight day schedule, into a system where users can easily identify their collection zone, download the collection schedule to an electronic calendar, or sign up for reminders that are delivered the night prior to collection by either SMS or e-mail. This type of application has the potential to reduce the circulation of paper waste calendars, resulting in cost savings, and can exhibit to

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[46] Aaron McGowan in discussion with the author, July 7, 2011.

[47] This is also brings about a point of clarification. While the City of London has released datasets, it does not mandate that its boards and commissions must also, which is true for other municipalities.

[48] Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011.

technologically savvy citizens that their local government can adapt to changing methods of information dissemination.

Similarly to David Eaves, McGowan outlined several areas where he feels the current open data initiatives have fallen short of responding to the desires of the community.[49] McGowan indicated that he has faced resistance from various departments at the City of London in addition to London Transit towards his requests for datasets.[50]Furthermore, he believes that the initiative has stalled following the 2010 Municipal Election, and that the initial gains made following the release of the City's data catalogue in September 2010 have been neutralised or reversed in light of the budget restrictions imposed by a zero percent tax increase.[51] Coupled with the shortcomings presented by the City's internal champion Elaine Gamble, London's open data project is currently facing a significant challenge in its ability to evolve and keep pace with the current leaders in Canadian municipalities.

4.7 Influence of Hackathons

One of the most important community aspects of open data has been the "hackathon," or "hackerfest." Simply put, it is a gathering of individuals for the purpose of developing useful applications or visualisation tools using data, typically municipal datasets. Each of the respondents aside from Ray Barnard, CAO of Medicine Hat, indicated that they were aware of hackathons, or had attended one in their capacity as a municipal official.

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49   Aaron McGowan in discussion with the author, July 7, 2011.
50   Aaron McGowan in discussion with the author, July 7, 2011.
51   Aaron McGowan in discussion with the author, July 7, 2011.

While typically initiated solely by community members, Guillermo Ferrero of the City of Nanaimo explained that he had organised one in April 2011 following a conference to spur the development of applications from the datasets his municipality had released. He had organised one to promote Nanaimo's datasets, which had been previously been ignored by developers who were interested more in creating applications from Vancouver's data catalogue.[52]

One of the most interesting insights towards community developers came from Guy Michaud, who explained that he believed those present at an Ottawa hackathon "were serving as a different type of volunteer, people who had donated their time to help their community."[53] This event ultimately lead to an applications competition in Ottawa known as Apps4Ottawa, which created nearly one hundred applications utilising the City of Ottawa's data catalogue.[54] A similar contest held prior to Ottawa's in Edmonton generated 32 web applications, and over 86 ideas that exhibited what the citizens of Edmonton desired to have developed.[55] While the contests had provided a $50,000 total prize, it was well worth it according to Michaud[56] and Ashley Casovan.[57]

A final point on hackathons and application contests is that they serve to spur innovation, and generate useful information about many services produced and delivered by individual municipalities. Jonathan

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[52]   Guillermo Ferrero (City of Nanaimo) in discussion with the author, June 9, 2011.
[53]   Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011.
[54]   http://www.apps4ottawa.ca/
[55]   http://contest.apps4edmonton.ca/
[56]   Guy Michaud (City of Ottawa) in discussion with the author, June 23, 2011.
[57]   Ashley Casovan (City of Edmonton), in discussion with the author, June 23, 2011.

Mark of the City of Vancouver explained that they are useful tools that produce valuable services to the community at a relatively low-cost when one considers what a local government would have to do to replicate the outcomes, either by diverting or hiring additional personnel.[58] Furthermore, they serve to facilitate a solution to a problem that local governments have suffered with for years, which is how to properly engage citizens. While hackathons may only encourage the participation of citizens with a particular skillset, they exhibit that municipal governments can be open and responsive to the wishes of common citizens. Furthermore, they can ultimately produce applications that can assist citizens in understanding the value of the services that are provided to them, and have the potential to show political and bureaucratic officials that municipal organisations could possibility operate more efficiently through standards of open and transparent government.

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[58]   Jonathan Mark (City of Vancouver) in discussion with the author, June 24, 2011.

Chapter 5: Conclusion

As was discussed earlier, the issues that have been prevalent throughout the e-government and gov 2.0 eras have continued to some extent with open data initiatives. While there are cases where open data programs have been properly funded and are thriving, there are just as many that have failed to attract the resources needed for their development.

The open data movement will continue to face challenges before it can become more pervasive throughout Canadian local governments. With only ten out of thousands of municipalities in Canada having established an open data program, and none with a population less than 55,000, it will require a significant effort before it is ultimately adopted as a common practice. The cases of Ottawa, Edmonton, and Vancouver will serve as the litmus test for how effective it can be in the areas of accountability, transparency, and citizen engagement, the main principles that are to benefit from open data.

While there are significant issues, it should not be assumed that the movement is in peril. There are tremendous opportunities available from a continued examination of open data, and that the movement will begin to attract more municipal organisations in the coming months and years. Furthermore, the optimism that is displayed by the municipal officials involved in their projects leads the author to belief that they will continue to fight for more resources to

allow for the initiatives to succeed. However, only time will tell as to

which direction, and what form open data will ultimately take as it

continues its progression.

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