

A Framework for Assessing the Value of Open Data

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Abstract

This paper presents four categories of open data value; political and social, economic, operational and technical, and organizational. The four categories of value constitute a framework for determining what types of value various user groups derive from open data. Key challenges to realizing value from open data include the lack of metrics (both quantitative and qualitative) for measuring non-economic types of value.

Background and Relevance

Public sector organizations collect and produce data that records authoritative information about government activities and constituents as a way to provide accurate authoritative data to support planning, decision-making, and service provision. Recently, the role of data in the public life has shifted. Once the domain of government agencies, centralized programs, and select private corporations, data has transitioned from a protected, private commodity to one that is public, 'open', and shared (Tinati, Carr, Halford, & Pope, 2012). With the rise of the Internet, the push for delivering open data has overtaken the simple delivery of government documents (Johnson & Sieber, 2012). Citizens have come to expect their government to be more transparent, often operationalized through the provision of an open data platform that can support government transparency, improved efficiency, and economic growth (Janssen, Charalabidis, & Zuiderwijk, 2012; Tinati et al., 2012).

A research gap exists in understanding the value and impact of open data initiatives. Open data is an emerging field, with little coordinated effort to reflect on and evaluate the value derived from various user groups (Feick & Roche, 2012). The objective of this paper is to develop a framework to categorize different types of value that various user groups derive from open data. Value is considered to be both economic and non-economic, with the non-economic category including political, social, technical and organizational measures of value. Using these categorizations, an Open Data Value Framework is presented and critiqued. Creating and testing a value framework is an important step towards development of an

understanding of where value from open data comes from, whom it affects, and how.

This paper directly addresses the goals and objectives of Theme 4: Open Everything, specifically the identification of the current landscape of open data in Canada, and the development of best practices for government provision of open data. This research will be further operationalized through in-depth surveys and interviews with partners, most notably municipal partners and other open data stakeholders (industry, non-profits). In this way, there is a strong role for partners to play as key informants of this research, and as an audience for its results.

Methods and Data

Developing an Open Data Value Framework

From reviewing the existing open data literature, it is evident that there is only an emerging understanding of the value that open data holds across stakeholders (Carpenter & Watts, 2013; Feick & Roche, 2012). Currently, perspectives on the value of open data are anecdotal, or reflect only the potential commercialization of applications developed from open data. Expanding upon Janssen et al.'s (2012) work, we establish four broad categories of value that will be used to develop an open data value framework. These categories are not meant to be mutually exclusive from one another, but are intended to capture different types of value that stakeholders gain from open data initiatives. This categorization of stakeholder types and value frames our presentation of four types of value that make up the open data value framework.

Political and Social Value

Political and social value are grouped together, mirroring Janssen et al. (2012). Political value is derived from open data that pertains to the political sphere, and social value is about maximizing the impact of public expenditure on societal benefits, including happiness, well being, health, inclusion and empowerment. This area of value includes benefits such as increased government transparency, democratic accountability and increased trust in government. One of the stakeholders to experience this type of value is government of all levels. The political value of having an open data initiative extends beyond increasing transparency of the government and into utilizing open data to improve services and develop innovative solutions to social issues. For example, open data can be used to develop applications such as SeeClickFix (<http://www.seeclickfix.com/>),

which allows citizens to report issues and then be notified when the issue is resolved. This type of application has the potential to facilitate communication between citizens, community groups and governments, with the goal of improving infrastructure and services, generating value for citizens. As the government utilizes open data to improve services, citizens themselves could become more involved in government, increasing the benefit they receive from open data. This kind of value is difficult to quantify because it cannot be easily costed from an economic perspective. There is no market price on government increasing their transparency or adopting an application such as a SeeClickFix that makes a potentially positive impact on daily citizen activities.

Economic Value

When discussing open data, the first type of value often presented is economic value. Janssen et al. (2012) found that participants identified that economic growth is one of the overarching arguments for government provision of open data. It is widely believed that releasing data to the public will increase innovation, create new businesses, and add value to the economy. Leveraging open data is broadly seen to create economic value both in the development of an application (with value through purchase price or advertising sales), and in the employment of developers. Carpenter and Watts (2013) show that the economic value of open data has the potential to greatly improve the economy, through net productivity gains in the government data ecosystem. For example, both the government and the private sector will obtain economic value in the form of data being readily available, resulting in a cost avoidance to obtain data. The private sector can realize cost savings on data for operations, redirecting investment elsewhere. The developer community is also poised to generate economic value from the release of open data. Developers are at the forefront of innovative application development, and many of these applications developed using open data are sold at a price, causing this group the potential to realize actual profit from open data. In addition, with economic growth can come job creation and greater opportunity and choice for citizens and consumers. With more innovative applications to choose from citizens are able to decide what works for them versus only having one option. Though difficult to estimate precisely, there is strong economic potential of open data to provide value amongst a range of stakeholder groups.

Operational and Technical Value

A major disadvantage of keeping data closed is the potential for duplication of efforts to recreate the same data. Open data counteracts unnecessary duplication and allows for organizational time and effort to be maximized. For example, a surveying company needs land parcel information to

complete survey requests. Prior to open data portals, this company would be required to purchase data from the government provider, or to replicate data on their own at great time and expense. Aside from the cost factor associated with this, there is the potential for the generation of discrepancies between data sets. Additionally, the administrative process surrounding data access can be optimized, as municipal workers have to manage a smaller number of requests for information, as they can now direct citizens requesting information to an open data portal instead of filling out paperwork for an information request. This results in a time-savings for employees. For example, the provision of open data could save on administrative costs and opportunity costs associated with the Freedom of Information Act that have been estimated at upwards of \$57 million annually across the USA (O'hanlon, 1984). Related to operational value is technical value, created by exposing data to external problem solving capacity and external quality checks. With greater access to and potentially use of government data, opportunities are created for feedback to government data providers about attributes and relevance of a data set. Certain types of errors and inaccuracies may be identified only through use and application of data. This exposure has the potential to improve data the government has, thus providing a higher quality source of data for decision-making.

Organizational Value

A fourth type of value from open data is organizational value, or value that is derived from the collection, cleaning, and release of data. Janssen et al. (2012) commented that an issue with open data is that the data has little intrinsic value; its value comes from its use. This statement does not take into account two main factors of organizational value; pride the government may feel by operating an open data portal, and internal organizational discovery and organization of datasets. First, as citizens continue to push for more transparency, having government reciprocate through transparency and open data initiatives can show that both elected officials and civil servants are responsive to citizen concerns. As a relatively new phenomenon, being able to point towards an operating (and ideally well-used) open data portal is good politics, also creating a sense of accomplishment and pride in government staff. Second, to release data via an open data portal, data needs to be collected internal to the organization. This can be a challenging task, as government may not have a clear idea of what datasets may exist within the organization (Currie, 2013). To discover what data they actually can provide, government must enact a process of identifying, collecting and cleaning data, a process that may be of great value to the government. Other areas of organizational value include horizontal access to data produce by different government divisions. For example, regional governments may not have easy access to data housed by municipal or provincial governments and vice versa. The organizational

value gained from open data initiatives will allow government easier access to data, across municipal, regional, provincial and federal governments.

Results

Challenges in Measuring Open Data Value

The framework presented in this section comes with several challenges. The four categories of value that can be derived from open data are broad and therefore not mutually exclusive from one another. A major challenge to valuing open data is that the benefits derived do not necessarily have a dollar value cost associated with them. For example, the political and social value of open data is important to many stakeholders, including government and citizens. It can even be challenging to accurately assess time savings that do have a dollar value associated with them. For example, full time equivalent (FTE) employee salary measures can be used to put a value on how much time previously was spent filling out information requests, but assessing cost savings pre- and post- open data will be difficult. The importance of government transparency to citizens is another area that may be difficult to quantify, as every citizen has a different view on how transparent their government should be. Surveys to citizens can be helpful, but it may be difficult capturing a wide sample of citizens to assess how important transparency is to the population. These non-economic benefits are extremely important to assessing the value of open data, but currently there has been little progress made to develop suitable measurement metrics.

Conclusions

This research defines categories of value derived from open data across stakeholders. The objective was to differentiate the types of value experienced by broad stakeholder groups involved in open data; government, the private sector, developer community and citizens. Based on the categorization of value, the Open Data Value Framework was developed. This framework is designed to trace data from its initial provision within government and based on the value derived from various user groups, follow it as it develops and impacts additional stakeholders. The main features resulting from this development include the four categories of value; political and social, economic, operational and technical, and organizational. These categories of value expand upon previous work by Janssen et al. (2012), who presented three categories of benefits, but disregarded organizational value, and did not attempt to determine what stakeholder groups received which category of value. This paper presents a

framework in which four categories are established and categorizes the stakeholders into these four areas.

Establishing the categories of value has an impact beyond the user groups. Knowing how open data affects stakeholders has the potential to change the way governments collect and deliver open data. As more products that use open data are created, the relationship between the government and stakeholders using and developing these products may need to change. For example, governments will need to keep providing data, at regular intervals and always without cost to the end user. Also, as government continues to open up more datasets, the public will be able to more closely scrutinize their actions, which may lead to unintended consequences, such as unproductive micromanaging and hyper-critique of government activities by citizens. Open data reinforces that relationship; the government is always going to be under pressure from external groups to produce more data. Being able to understand where the value of open data is has the potential to dramatically affect the way that government produces and utilizes open data.

The literature discussed throughout this paper demonstrates a need for more research. Janssen et al. (2012) is an early study that looks at the benefits and barriers of open data, though largely in the literature open data is discussed generally and the benefits are often assumed and anecdotal. This paper begins to address the significant research gap that exists in understanding the value and impact of open data initiatives. There are inherent issues with measuring the value derived from open data, as the majority of the benefits generated do not have a specific market price or cost associated with them. As a relatively new phenomenon most of the attention has been on developing open data portals and releasing data to the public, and not on the impact of releasing data, from the twin perspectives of government and stakeholder.

The Open Data Value Framework presented in this paper is based on a critique of the limited scope of research already done in this area. It is suggested that this framework be a starting point for future research done on the value open data holds. Future research should aim to further define the stakeholder groups identified. This will give a more accurate image of the spectrum of stakeholders that derive value from open data. Additionally, interviewing the key players in each stakeholder group will generate important perspectives on the value of open data. The value of open data should be taken beyond this initial framework and be measured as reported by the user communities (stakeholders). The input of the various stakeholders will help to further refine the four broad categories of value into more specific categories to be measured and evaluated.

Lastly, it is suggested that a set of quantitative and qualitative metrics be developed to guide the evaluation of open data strategies at all levels of government. The metrics should include each category of value so that the impact open data has on society can be measured. It is important to include qualitative metrics, or develop quantitative methods of measuring social value, as open data has a major impact beyond simple economic value. This type of research would respond to the current lack of methods of evaluating the impacts of open data, moving beyond anecdotal examples. Research in this area is critical and would make a significant contribution to the emerging discourse on the use and value of open data and support policy.

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