

Chapter 11

The Interoperability of US Federal Government Information: Interoperability

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ABSTRACT

Interoperability sets standards for consistency when integrating information from multiple sources. Trends in e-government have encouraged the production of digital information yet it is not clear if the data produced are interoperable. The objective of the project was to evaluate interoperability by building a retrieval tool that could track United States public policy from the legislative to the executive branch using only machine-readable government information. A case study of policy created during the 2008 financial crisis serves as an illustration to investigate the organizational, technical, syntactic, and operational interoperability of digital sources. The methods of citing law varied widely enough between legislation and regulation to impede consistent automated tracking. The flow of federal policy authorization exemplifies remaining socio-technical challenges in achieving the interoperability of machine-readable government data.

INTRODUCTION

Legislatures pass laws that authorize executive agencies to enact public policy. Is it possible, using only digital government documents, to track the flow of policy authorization? The answer is an investigation into interoperability and the potential of building “big data” to describe government activity. Big data connects machine-readable sources in order to identify patterns through computational analysis. Interoperability sets consistency standards for the integration of both technology and information structures. Aside from promoting transparency, digital public sector information (PSI) contains valuable descriptions of how governments do business. Breaking barriers to institutional data silos could have a

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broadier impact on promoting transparency objectives. Computational methods could enhance internal and external understandings of governance patterns.

Management scholars have embraced the study of big data as a continuation of existing information systems research (Agarwal & Dhar, 2014; Dhar, 2013; Sundararajan, Provost, Oestreicher-Singer, & Aral 2013). Big data brings the potential of using methods such as business analytics (Chen, Chiang & Storey, 2012), predictive analytics (Shmueli & Koppius, 2011), machine learning (Domingos, 2012), and data mining (Hand, Mannila & Smyth 2001). Business analytics is a driving force behind many private sector innovations (Goes, 2014; Quaadgras, Ross, & Beath 2013). The public sector has equal potential (Kim, Trimi, & Chung, 2014; Washington, 2014). In response to eGovernment directives, transparency initiatives, and open data advocacy, public sector managers have published increasing amounts of digital material. The proliferation of government information has opened up the potential for linking multiple sources into large-scale big data collections.

This chapter investigates interoperability as part of a larger investigation into the research potential of open government data. In a multi-year funded effort our research group, PI-Net, is using “big data” computational methods to ask questions about policy, politics, and governance (Wilkerson & Washington, 2012). New data collections give researchers new ways to ask questions, and large government collections present many opportunities. The unique features of government information may give rise to computational research challenges not seen in other data. Interoperability was a starting place to identify the challenges and potential of current data sources. We approached the problem by building a collection of data and documents from multiple government organizations.

The connection between the legislative and executive branches exemplifies a critical aspect of governance as well as the coordination of multiple organizations. Legislation instructs other government organizations to implement policy described in laws. Laws must be widely distributed to those who are impacted and to those who must implement public policy. Regulations, also known as secondary legislation or administrative law, are the specific rules set by agencies for implementing policy. Law is already conceptually interoperable with standardized systems of references and citations. Legal citations reference specific blocks of text, although each reference might be to a portion or to the entirety of the text. Previous research has recognized the potential of digital legal documents and investigated law as a digital library (Arnold-Moore, Anderson & Sacks-Davis 1997), as hypertext (Wilson, 1988), and as artificial intelligence (Liebwald, 2013; Matthijssen, 1998). This chapter builds on previous research on digital legislation.

The research design was to build and evaluate a system that tracks the policy authorization process using only United States federal open government data. The United States has a long history of federal information policy that promotes the release of material. The commitment to print publications has been expanded to a commitment to publish digital information. The project tracked policy released in electronic formats from Congress to federal agencies. Although conceptual systems for tracking legislative proposals to administrative activity have existed, it is only recently that the requisite standards, mandates, and requirements are in place to attempt machine-readable tracking.

The objective of the project was to evaluate interoperability by building a retrieval tool. First, we designed a logical model of information shared across organizations. The logical model is refined to specific documents and activities in a model we call Authority-Tracker. Next, we built a proof-of-concept retrieval tool based on that model called AUTHORITY-TRIEVE. The retrieval tool consolidated digital sources from the executive and legislative branches. Finally, we used the tool to trace United States public policy and evaluate the interoperability of the data. This paper presents a case study of tracking

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