Chapter 7

Big Data, Semantics, and Policy-Making: How Can Data Dynamics Lead to Wiser Governance?

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ABSTRACT

At the heart of all policy design and implementation, there is a need to understand how well decisions are made. It is evidently known that the quality of decision making depends significantly on the quality of the analyses and advice provided to the associated actors. Over decades, organizations were highly diligent in gathering and processing vast amounts of data, but they have given less emphasis on how these data can be used in policy argument. With the arrival of big data, attention has been focused on whether it could be used to inform policy-making. This chapter aims to bridge this gap, to understand variations in how big data could yield usable evidence, and how policymakers can make better use of those evidence in policy choices. An integrated and holistic look at how solving complex problems could be conducted on the basis of semantic technologies and big data is presented in this chapter.

INTRODUCTION

To ensure global prosperity there is a need to bridge the gap between big data and policy-making, to “overcome mistrust and misunderstanding, [to] resolve conflicts of goals, and [to] learn to speak the same language” (Jacoby, 2013: 3). This ongoing divergence is raising a serious question of social responsibility and is calling for a drastic change by investigating the scientific and moral foundations of contemporary beliefs to help decision-makers in dealing with complex global issues. It is thus imperative to place big data and policy-making in the time horizon of doing the informed right thing rather than merely doing. In other words, there is an urgent need to be endowed with an ability to exercise wise judgment, to adopt a balanced perception of doing based on the assumption that political, scientific and ethical aspects are closely interrelated and mutually reinforced. In doing so, serious attention should be
paid to the relationship between big data and policy-making on one side and ethics on the other side with a perspective to go beyond the use of big data to inform policy, towards seeking novel meta-evidences inferred from available big data to underpin wise judgment leading to sustainable policies. According to Marcus (2013) “solving problems will often require a fair amount of ... specific information often gathered painstakingly by experts. So-called machine learning can sometimes help, but ... Big Data is a powerful tool for inferring correlations”.

Believing that the most pressing problems organizations face today are characterized by unprecedented levels of complexity and interdependence leads to the breakdown of the conventional problem-solving paradigm focusing on explicit knowledge and incremental improvements, and go about leveraging from the currently experienced change and complexity. USCCF (2014: 7) has stated that regardless of what form it takes, big data has the potential to identify new connections and opportunities, and enable improved understanding of the past to shape a better future. Bean (2017) has argued that big data is already being used to improve operational efficiency, and the ability to make informed decisions based on the very latest up-to-the-moment information is rapidly becoming the mainstream norm. Yet, the most critical dilemma facing industries isn’t the big size and the related enormous complexity of big data, but having the right data (Wessel, 2016). This challenge does not lie in a lack of data processing tools, but more in a holistic, integrated and unified framework governing the steady flow of data. Despite the increased adoption of data analytic tools, the current state of the art shows that using big data to solve complex problems still remains problematic.

By its very construct, big data analytic tools were designed to enable in-depth understanding of complex issues, anticipating possible scenarios and making better decisions. Although these issues can be similar across different disciplines, too many data will look too hard to form any coherent judgment. Maybe it is difficult to deal with this elusive challenge because policy-making is based on a context-dependent process and the idea of using big data, which is still a very slippery concept, requires making best use of global knowledge sources. However, a holistic picture can be drawn from the exploration of the distinguishing characteristics of the social and semantic faces of the web of data. More specifically, dealing with this gap and finding meaningful correlation relies fundamentally on data indexing and information integration based on domain knowledge representation. Following today's transition towards a new era of wise and smart forms of managing and organizing, this chapter makes a conceptual contribution by investigating the question How to make best use of big data to inform policy-making and complex problem-solving? and provides a generic, holistic and integrated framework for big data governance based on semantic web principles.

Narrowing the focus of the research the remainder of this chapter unfolds as follows: firstly the background of this research work and the foundations in the contribution areas are summarized in order to better identify the trends to look for and understand the breadth of the topic to be addressed. Then, the focus would be on data dynamics-based ontology engineering as it is the provided response to the increasing complexity facing modern organizations in their pursuit of big data governance. Next, a specific lens will be put on policy-making as application area of the designed framework to big data governance. The author concludes this chapter by summing up what was done and suggesting future directions of research.