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Developing a Method to Valuate the Collection of Big Data

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ABSTRACT

Although organizations recognize the potential of "big data," implementation of data analytics processes can consume a considerable amount of resources. The authors propose that when organizations are considering this costly and often risky investment, they need a systematic method to evaluate the costs of data collection associated with the implementation of a new data and analytics (D & A) strategy or an expansion of an existing effort. Therefore, in this article, a new dimension of big data is proposed which is incorporated into a theoretically justified and systematic method for quantifying the costs and benefits of the data collection process. By estimating the worth of data, organizations can more efficiently focus on streamlining the collection of the most beneficial data and jettisoning less valuable data collection efforts.

KEYWORDS

Analytics, Big Data, Data Valuation, Data Valuation Evaluation, Data Valuation Process

INTRODUCTION

Interest in data and analytics (D & A) by business, healthcare, government, and numerous other entities continues to increase exponentially. By definition, analytics involves quantitative and/or qualitative analysis of data in an effort to categorize and identify patterns to unveil meaningful trends. It also encompasses various business intelligence initiatives (Gartner, 2017). Data and analytics support decision-making through a better understanding of an organization's customers and its products, as well as identification of possible risks to the firm (Yaqoob et al., 2016). The interest in this area is due in no small measure to the recent availability of computational and analytical tools necessary to store, access, organize, and analyze such massive text and imagery data. In fact, there is a growing interdependence between computational modeling and data analytics, which is not without unique technical challenges, particularly in the areas of science and engineering (Reed & Dongarra, 2015). The prominence of "big data" was made evident in August 2010 when it, along with healthcare and national security, was positioned by the White House, Office of Management and Budget (OMB), and the Office of Science & Technology Policy (OSTP) as a national priority (Kaisler, Armour,

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Espinosa, & Money, 2013). According to Gartner (2017), big data is "high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation."

Investment in big data and analytics continues to increase rapidly. A recent Forbes article declared that worldwide revenues for business analytics and big data will increase from $130.1 billion in 2016 to more than $203 billion in 2020 (Press, 2017). Such investment growth appears to reflect a considerable interest by organizations of all types and sizes in big data and data analytics.

With such significant investment in and continuing growth of big data and analytics, it is not unreasonable to conclude that organizations believe that big data and analytics can improve business performance. In fact, the MIT Center for Digital Business sought to test the hypothesis that data-driven organizations would generally be better performers (McAfee, Brynjolfsson, & Davenport, 2012) than other organizations. Their results indicate that companies in the top third of those organizations that use data-driven decision making were approximately 5% more productive and 6% more profitable than their competitors. Such findings demonstrate the importance of the use of big data and data analytics by corporations.

Although organizations recognize the potential of "big data," implementation of data analytics processes can consume a considerable amount of resources (Raghupathi & Raghupathi, 2014). Indeed, the amount of financial investment and time resources necessary to effectively implement a new data analytics initiative in an organization is significantly more than traditional analytics approaches (Raghupathi & Raghupathi, 2014). Furthermore, D & A projects can be risky, as Gartner estimates that they falter 60% of the time (Carande, Lipinski, & Gusher, 2017).

We propose that when organizations are considering this costly and risky investment, they need a systematic method to evaluate the costs of data collection associated with the implementation of a new D & A strategy or an expansion of an existing effort. While any new process will involve the use of organizational resources, this is not always easily quantified. Ward, Daniel, and Peppard (2008) offer ways of overcoming the difficulties of this quantification, several of which are pertinent and adaptable to the valuation model presented herein: estimations of detailed internal evidence, modeling or simulation, and benchmarking of existing cutting-edge processes of first-mover corporations or comparable processes in other industries. In this paper, we propose a new dimension of big data which we incorporate into a theoretically justified and systematic method for quantifying the costs and benefits of the data collection process. Such an approach will bring economic and effective solutions to improve business decision making.

The remainder of the paper is organized as follows: first, we propose a new dimension of big data: valuation. We then present the systematic method for organizations to evaluate the value of a particular D & A initiative. Finally, practical implications of the method are offered.

VALUATION

Information is power. The three dimensions of big data have often been defined as volume, variety, and velocity (Kaisler et al., 2013). We will now describe each of the extant dimensions.

Volume

The amount of data available has grown exponentially with 90% of data in the world produced in less than the last five years (Wu, Zhu, Wu, & Ding, 2014). Organizations are developing ways to obtain useful information from the volume of available data today. At the most basic level, organizations must understand how to work with the size and variety of data and how to use this information in a forward-thinking manner (Wu et al., 2014). Other important considerations include ownership of the information, access, collection and storage of the data. The ability to apply a valuation dimension to the management of the volume of data and sheer number of records available will allow for strategic decision making.