Chapter 14
A Conceptual Model for Describing the Integration of Decision Aspect into Big Data

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ABSTRACT

Big Data is an important topic for discussion and research. It has gained this importance due to the meaningful value that could be extracted from these data. The application of Big Data in the modern business allows enterprises to take faster and smarter decisions, achieving a real competitive advantage. However, a lot of Big Data projects provide disappointing results that don't address the decision-makers' needs due to many reasons. The main reason for this failure can be summarized in neglecting the study of the decision-making aspect of these projects. In light of this challenge, this study proposes the integration of decision aspect into Big Data as a solution. Therefore, this article presents three main contributions: 1) Clarify the definition of Big Data; 2) Presents BD-Da model, a conceptual model describes the levels that should be considered to develop a Big Data project aiming to solve a problem that calls a decision; 3) Describes a particular, logical, requirements-like approach that explains how a company develops a Big Data analytics project to support decision-making.

INTRODUCTION

We are living in an era where we are witnessing massive and continuous production of data with different formats (videos, images, text, etc.) by users on social media, IoT devices, smart devices, and other sources. We can say that we have entered the era of Big Data, where Big Data has increasingly become an important area for discussion and research. A large number of scientists and researchers of many disciplines have written on this important subject. Big Data has acquired this importance because of the significant value that can be derived from the processing and analysis of this data (Panneerselvam, Liu, & Hill, An Introduction to Big Data, 2015).

Big Data can play a leading role in today's organization's decision-making. Nowadays, there is a popular idea, that Big Data enables businesses to create a powerful foundation for making better, faster, evidence supported, and more reliable decisions (Janeiro & Eduardsen, 2018). Probst et al. (2013) stated that the application of Big Data in modern business provides insights and business intelligence in real-time, such as trends and characteristics of their customers, enabling companies to react quickly and optimize their decision-making processes, which in turn can lead to improved business performance and a competitive advantage (Probst, et al., 2013). Similarly, Kościelniak and Puto (2015) stated that if organizations succeed to incorporate Big Data tools and methods into their businesses to extract the correct and beneficial information from the data, they can support their decision-making to make faster and more adequate decisions leading to cost reduction, development of new products and creation of optimized tenders and emergence of market trends, thus they can create sustainable competitive advantage (Kościelniak & Puto, 2015). For instance, Brynjolfsson, Hitt, and Kim (2011) found that companies that make data-based decisions can lead to a 5-6% productivity increase.

Data is a strategic asset but is worthless if it is not used constructively and appropriately to provide valuable results (Marr, 2015). All today's organizations aim to adopt big data, while little is known about the effective operation of Big Data analytics in business problem solving or decision-making (Akter, Bandara, Hani, Wamba, Foropon, & Papadopoulos, 2019). As a result, a lot of Big Data projects developed by organizations failed or fall short of their objectives. For instance, a survey conducted by Infochimps (2012) indicated that 55% of Big Data projects provide disappointing results, while Gartner warned that 60% of big data projects would fail and be abandoned through 2017 (as cited in (Grover, Chiang, Liang, & Zhang, 2018)).

The literature has shown that the reason these projects fail to produce the desired results lies in the way these projects have been developed since organizations generally focus on data itself and Data Analytics without a focus on decision-making which is the actual use of Big Data. In this context, Taylor (2017) explained that the focus on identifying the required data, the analytical technology to be used, and the workflow without focusing on decision-making per se prevents projects of data mining and predictive analyzes of obtaining the desired value. In another study, Infochimps (2012) explained that the main reason for the failure of Big Data projects was the lack of communication between managers who presented a global vision of the project – a global vision of the decision to be made and the desired information from data analysis – and Big Data analytical team responsible for actually implementing. Besides, the lack of business context around the data and the lack of expertise on business hinder the overall understanding of business, business objectives, and its use in decision support (Infochimps, 2012).

This paper contributes to the current essential need to understand how to develop an effective big data project to support decision-making within organizations. Despite recognizing the vital role of big data in supporting decision-making on the organization, most studies are focusing on technological aspects

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