

Chapter 27

A Synergetic Model for Implementing Big Data in Organizations: An Empirical Study

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ABSTRACT

The term BIG DATA has been increasingly used recently. Big data refers to the massive amount of data that are processed and analyzed using sophisticated technology to gain relevant insights that will help top executives with the decision-making process. This study is an attempt to investigate the big data implementation in organizations. The literature review reveals an initial model of indicators that might affect big data implementation. This model was examined and extended by primary data collected from key people (CEO and managers) from ten organizations. The extended model of indicators, which is the result from this research, includes the factors that would affect the success or failure of big data implementation in organizations. The research findings showed the following factors: top management support, organizational change, IT infrastructure, skilled professional, contents (i.e. data), data strategy, data privacy and security.

INTRODUCTION

The term 'big data' has gained huge popularity in recent years among IT professionals and decision makers. A recent survey, conducted by IDG Enterprise (2014) amongst more than 750 IT decision-makers, has shown the interest in big data continues to rise, as nearly half of the respondents (50%) are implementing or planning to implement big data projects within their organizations. Data is increasing massively nowadays. Easily, it is possible to find data in every aspect of our life. Data is getting bigger because it

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is being generated from more devices and sources. According to a report published by cisco in 2015, around 11 billion devices will be in use by 2019. Obviously, huge volume of data would be generated. Furthermore, it is interesting to see how data increased in the past decade. A study by Intel showed that humankind has generated five Exabytes until 2003. Data has increased to reach 2.7 Zettabytes from 2003 to 2013, (i.e. 500x more data). Data will continue to increase to three times bigger by 2015. In same context, Das & Kumar (2013) stated that nowadays five Exabytes is being generated every two days. This will continue to reach eight Zettabytes by 2015 (i.e. equivalent of 18 million libraries of Congress).

It is obvious how the volume of data is increasing enormously. But in spite of that, a very small fraction of this data has been exploited; the rest is not tapped yet. This shed light on the types of data. There are two types of data, structured data which can be sorted and organized in ordinary database engines. At the other hand, unstructured data does not have pre-defined data models that allow sorting in the ordinary databases such as videos, photos, images, emails, text documents and blogs. Das & Kumar, (2013) argued that unstructured data would account for 90% of data in the next decade. They stated that analyzing this massive amount of data would expose new improvements that were impossible to determine previously. Hence, organizations would seek for technologies that allow them to deal with this data. Here, big data and analytics appear in the horizon to achieve that.

Big data is defined as “Large pools of data that can be captured, communicated, aggregated, stored, and analyzed” (Manyika et al. 2011, p. 4). However, Laney & Taylor (2013) spoke on conditions of big data. They conditioned the data growth to be three-dimensional, high volume where data is very huge in size, high velocity where data is increasing very quickly in a pace that we can’t follow, and high variety where data is coming from variety of sources. For that, Woo et al. (2011) combined the above in their definition. They characterized big data as the new generation of technology and architecture that is designed to extract value from a very large volume of data that is coming from variety of resources by enabling high-velocity capture, discovery and/or analysis.

With the availability of the data, organizations seek to extract value and gain business intelligence needed to achieve their goals. Das & Kumar (2013) argued that big data analytics as a technology-enabled strategy would help organizations in gaining richer, deeper, and more accurate insights into customers, partners and the business and ultimately gaining competitive advantage.

This research aims to develop a model of factors that will affect the successful implementation of big data. In order to identify those factors, it is important to study why organizations are implementing big data, and identify the challenges that hinder the successful implementation. This is done by studying the relevant literature. The result obtained from the literature will be used to develop an initial model of factors that effect on implementation of big data. This will be followed by primary data collection through semi-structured interviews. The themes obtained from the literature review results will be considered as the basis to build the interviews’ questions. Furthermore, the findings obtained from the primary data will be used to extend and consolidate the initial model.

This research will try to address the points that have not been touched-upon in the previous research. Most of the previous research addressed big data from theoretical perspectives. Many scholars covered the opportunities and challenges of big data. However, little research has empirically devised a model that could be used as a framework to guide the implementation process in organization. The current research contributes to the existing body of knowledge on big data implementation by developing a holistic model of factors that could affect big data implementation.

The current research is structured as follows: section two presents literature review on big data. This section concludes an initial model that could help or hinder big data implementation. Section three shows

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