

Chapter 75

Understanding the Determinants of Big Data Analytics Adoption

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ABSTRACT

This article aims to empirically investigate the factors that affects the adoption of big data analytics by firms (adopters and non-adopters). The current study is based on three feature that influence BDA adoption: technological context (relative advantage, complexity, compatibility), organizational context (top management support, technology readiness, organizational data environment), and environmental context (competitive pressure, and trading partner pressure). A structured questionnaire-based survey method was used to collect data from 231 firm managers. Relevant hypotheses were derived and tested by partial least squares. The results indicated that technology, organization and environment contexts impact firms' adoption of big data analytics. The findings also revealed that relative advantage, complexity, compatibility, top management support, technology readiness, organizational data environment and competitive pressure have a significant influence on the adopters of big data analytics, whereas relative advantage, complexity and competitive pressure have a significant influence on the non-adopters of big data analytics.

1. INTRODUCTION

Emerging economies had witnessed dramatically changing business environment and severe market competition (Paley, 2017). Given this competitive landscape firms have still prompted to adopt various state-of-the-art Information Technologies (IT) to improve their business operations and performance

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(Pan and Jang, 2008; Faizi et.al., 2017). Technologies have also changed in this decade. The term “big data analytics (BDA)” has been critical in the world of IT. BDA, or the analysis of structured and unstructured data of consumers and devices to conduct business, is recognized as an important area for IT innovation and investment (Manyika et al., 2011; Zomaya and Sakr, 2017). BDA has been spread out through the main areas related to information systems (IS) and technologies, such as databases, analytical tools and visualization techniques for firms (Chen and Zhang, 2014; Zomaya and Sakr, 2017). In other words, BDA is a kind of data capturing, storing and analyzing tools and techniques that is similar to data warehousing and business intelligence (Faizi et.al., 2017). BDA also uses ubiquitous data from various sources like cloud, social media, geo-location and more for generating insights which could be used by the business employees for decision making (Labrinidis and Jagadish, 2012; Zomaya and Sakr, 2017). Thus, BDA enable firms to utilize huge amount of structured and unstructured data for (near) real-time decision making. Advanced IT devices, social media services, and corporate information system are continuously churning out vast amount of data. Businesses today are increasingly facing challenges in managing and capitalizing them to their advantages. Using BDA, a firm perform better in monitoring acceptance of products/services in the marketplace and in understanding its business environment by potentially fueling competitive advantages (Davenport, 2014; Thuemmler and Bai, 2017; Verma, 2018). Already there is no shortage of evidence that BDA, if adequately utilized, can unleash major impacts on reducing business costs, kindling business insights, and unraveling strategic information, and subsequently boosting quality and effectiveness of corporate decision making (Chen and Zhang, 2014; McAfee and Brynjolfsson, 2012; Zomaya and Sakr, 2017). Thus, BDA provides the opportunity of improving the performance and business processes to firms (Paley, 2017).

From a business point of view, firms are increasingly attempting to integrate business processes into the existing information systems (IS) applications and build fact-based technologies for making decisions in real-time (Gandomi and Haider, 2015; Verma et.al., 2018). Industries are getting ubiquitous amount of data from various customers’ touch points, geo-location, social media and sensors have become one of the key aspects for improving operation efficiency (Paley, 2017). To enhance competitive advantage, developing BDA capability is an important undertaking because it is rapidly changing the way that enterprises’ understanding of their customers, and also thus becoming a more integral part of enterprises’ business tactics (LaValle et al., 2013; Paley, 2017). BDA diffusion becomes a significant topic because it enables firms to execute data analytics along value chain activities (e.g. manufacturing, distribution, sales, finance, information sharing, customer service and collaboration with trading partners) (Russom, 2011; Paley, 2017).

While BDA has been discussed as a new technology development that can provide several advantages, at strategic, tactical and operational level, to its adopters, the BDA adoption rate is not growing as fast as expected (Tien, 2013; Paley, 2017). In fact, LaValle et al., (2011) surveyed different companies from different industries that have built analytics applications using big data and analyzed how BDA affected companies’ operational and strategic decisions. The future of analytics lies in BDA, whose major goal is to increase the operational efficiency, information of strategic direction, development of better customer service, identification and development of new products and services, identification of new customers and markets, etc. (Chang and Zhang, 2014; Paley, 2017). Many firms began carefully examining the possibility of utilizing big data analytics and are actively considering its adoption (Rosati and Lynn, 2017; Guarisco and Langabeer, 2017). Owing to the lack of exploratory studies that explain the diffusion and adoption of BDA (Kwon et al., 2014; Rosati and Lynn, 2017), the current study aim is to understand the process of adoption of the technology and to identify factors affecting the BDA adoption decision in organization.

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