Chapter 89
Big Data Adoption:
A Comparative Study of the Indian Manufacturing and Services Sectors

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ABSTRACT

This study inspects how big data is comprehended by IT experts and the difficulties that they have in respect to the reception of big data examination. The study also looks into the contributing factors of big data adoption within the manufacturing and services sectors in India. The data were analyzed using exploratory and confirmatory factor analyses, and relevant hypotheses were derived and tested by SEM analysis. The findings revealed that relative advantage, compatibility, complexity, organizational size, top management support, competitive pressure, vendor support, data management, and data privacy are the factors that are important for both industries. Through a comparison of the industries, statistically significant differences between the service and the manufacturing sectors were found; in other words, it has been noted that the relative importance of all factors for big data adoption differs between the industries, with the only exception being its complexity – it was found to be insignificant for the manufacturing sector.

INTRODUCTION

The development of Big Data has changed the manner in which organizations work and contend. The approach of Big Data has as of now and will further modernize numerous fields, including organizations, logical research, open organization, genomics, social insurance, operations management, the industrial internet, finance, etc. Big Data may be defined as a collection of massive and diverse data sets requiring advanced techniques and technologies to enable the capture, storage, distribution, management, and analysis of the information (Gandomi & Haider, 2015). In other words, it is a collection of huge and complex amalgamation of data sets that make it difficult to process using traditional data processing platforms. Big Data analytics (BDA) refers to the process and techniques used to analyze massive data in order to obtain value from that data.

Pragmatically, Big Data brings many attractive opportunities, such as increasing operational efficiency, enhanced strategic directions, developing better customer service, identifying and developing new products, services, new customers and markets. Use of BDA examines geospatial information and stock use on distributions, which gives bits of knowledge to manufacturing and service firms. These experiences could empower firm leaders to get request gauge continuously, mechanize substitution choices and distinguish main drivers of cost wastefulness (Dubey et al., 2016; Verma, Bhattacharyya, & Kumar, 2018). These measures could lessen lead times, costs, deferrals and procedure interferences, along these lines at last making worth. Besides, from the provider side, the quality or value aggressiveness can be improved by examining the provider's information to screen execution (Ren et al., 2017).

BDA can likewise limit execution fluctuation and avert quality issues by diminishing piece rates and diminishing an opportunity to advertise. In social insurance, BDA can make an incentive by improving quality and proficiency of administrations, and by coordinating patient information crosswise over various divisions and establishments (Gandomi & Haider, 2015). BDA can likewise give different constant data on perspectives, for example, traffic and climate. BDA can make an incentive for the financial area by empowering measurement of different operational dangers. BDA can even be utilized to recognize systems of teaming up fraudsters, or find proof of deceitful protection or advantages claims. This may at last lead to the revelations of until now unnoticed fake exercises (Elgendy & Elragal, 2014). However, despite these advantages of Big Data, evidence suggests that not all companies are rushing to adopt Big Data, or for that matter, Big Data analytics (Kwon, Lee, & Shin, 2014).

The purpose of this study is to understand the factors of the adoption of Big Data and its relative advantage to organizations. Most of the earlier studies on Big Data have focused solely on the technical and operational issues (Chen & Zhang, 2014; Lee, Kao, & Yang, 2014). Only a few studies have addressed the quintessence of adopting Big Data from an organizational perspective. As a matter of fact, no study has conducted a comprehensive evaluation of the factors on Big Data adoption. This study thereby looks to develop a research model based on technological, organizational and environmental framework in an attempt to lend more clarity. Further, two new constructs specific to Big Data have been added: data management and addressing privacy concerns. This study presents therefore, a more holistic assessment of the factors of Big Data by splitting them in two sectors – the manufacturing and the service sectors; in the process, this study contributes to a wider body of scientific knowledge that has so far not been studied. Further, this study highlights the importance of systematically evaluating the factors of Big Data at the industry level; and through the literature review provides the background on Big Data and related research. Further the study discusses the theoretical foundations for the research model and proposes hypotheses. The research methodology and the results are then presented, followed by a discussion of the major findings. The study concludes with implications of the findings and the scope for future study.

BACKGROUND

The term Big Data is used to describe unstructured enormous data that require more real-time analysis. Manyika et al. (2011) defined Big Data as "datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze" (p. 1). According to Hashem et al. (2015), Big Data is "a set of techniques and technologies that require new forms of integration to uncover large hidden values from large datasets that are diverse, complex, and of a massive scale" (p. 100). Thus, Big Data develops new methods or technologies for massive data that are difficult to store, process,

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