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The Impact of Big Data on Firm Performance in Food Industry

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Abstract

Big data is one of the most recent developments in food industry technology. However, despite the jobs this technology offers, its acceptance is still at its early stages in many industries. Therefore, this study seeks to identify the factors that impact the acceptance of big data in the food industry. The impact of big data on the performance of food companies is investigated. We collected the data from 100 employees of Sharvand food industries in Tehran. The data was analyzed using Structural Equation Modelling (SEM). Findings show that compatibility, top management support, organizational resources, organization size, external pressure, and IT expertise positively affect big data acceptance. Security and privacy negatively affect the acceptance of big data. It was also found that the complexity and cost of acceptance did not affect the acceptance of big data. Acceptance of big data also has a positive effect on the company's performance.

Keywords: Big Data, Structural Equation Modelling, Food Industry, Performance, Acceptance

1. Introduction

The term "big data" refers to information which cannot be handled by traditional instruments. In other words, a large quantity of data sets contains complex, big data information which cannot be manually handled (traditional method of organizing big data) (Zikopoulos & Eaton, 2011).

The massive increase in big data from smartphones, social media, the Internet, and multimedia has resulted in an overwhelming stream of structured and unstructured data (Ahani et al., 2021; Nilashi, Abumalloh, et al., 2021; Nilashi, Ahmadi, et al., 2021; Nilashi, Samad, et al., 2021; Yadegaridehkordi et al., 2021). Big data technologies are being developed and implemented in a food supply chain that collects and analyzes such data. Such technologies necessitate novel approaches to knowledge collection, storage, processing, and extraction (Belaud, Prioux, Vialle, & Sablayrolles, 2019; Misra et al., 2020; Navickas & Gruzauskas, 2016).

Researchers have long been concerned about how innovations are adopted and used. In healthcare, business, education, and economics, numerous studies on technology adoption have been conducted. Acceptance of new technology is what determines a company's willingness to innovate (Ahmadi et al., 2018; Mohammed, Ibrahim, Nilashi, & Alzurqa, 2017; Rad, Nilashi, & Dahlan, 2018; Roudposhti et al., 2018).

Big data offers a way for businesses to improve their performance. However, it is still in its early stages, and many businesses are hesitant to adopt it. Big data acceptance is influenced by technological, organizational, managerial, and environmental factors and impacts a company's performance (Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016; Ghasemaghaei & Calic, 2020; Wamba et al., 2017). Simultaneously, ranking acceptance factors can assist stakeholders and policymakers in focusing on the most important aspects of budgeting and resource management through the adoption of this technology. Nevertheless, no theoretical framework has been developed to consider all of those perspectives on big data adoption, and predicting the importance of the factors influencing big data acceptance remains largely unknown in the literature. Given this gap, this study provides a conceptual model for identifying the factors affecting big data acceptance and its impact on firm performance using structural equation modeling and using the views of managers and experts in the food industry. Given the importance of this issue, this research aims to identify the factors that influence big data acceptance and its impact on company performance in the food industry. As a result, the impact of organizational, technological, environmental, and human factors on big data adoption is investigated in this study. Furthermore, we also study the impact of big data on the performance in food industry.