**International Journal of Organizational and Collective Intelligence**
Volume 7 • Issue 3 • July-September 2017

# Big Data Management:
## Advanced Issues and Approaches

Kijpokin Kasemsap, Suan Sunandha Rajabhat University, Bangkok, Thailand

### ABSTRACT

The objective of this article is to provide the advanced issues and approaches of big data management. The literature review indicates the overview of big data management; the aspects of Big Data Analytics (BDA); the importance of big data management; the methods for big data management; the privacy and security concerns of big data management; and the big data management in the health care industry. Organizations that have been successful in working with effective big data management have accomplished this issue using data to help make sense of the information. The volume of data that companies are able to gather about customers and market conditions can provide business leaders with insights into new revenue and business opportunities, presuming they can spot the opportunities in vast amounts of data. The literature review analysis provides both practitioners and researchers an important understanding about big data management in modern organizations.

### KEYWORDS

Big Data Analytics, Data Mining, Hadoop, MapReduce, Privacy, Security, Variety, Velocity, Volume

### INTRODUCTION

Multidimensional data originates from many sources, and is relevant for many applications (Grottel, Heinrich, Weiskopf, & Gumhold, 2014). Big data management deals with huge data which is unstructured (Rekha & Parvathi, 2015), and is intended to provide both strategic and technical approaches for organizing the large volume of data required to support the enterprise decision-making process (Ta, Tanque, & Washington, 2015). It is possible to transform business, government, and other aspects of the economy by big data management (Mishra & Sahoo, 2016). Big data management represents the significant change in the volume of data which can be processed, the reduction in the processing time required, and the reduction in the cost required to store the data (Anderson & Hardin, 2014).

Big data management is receiving significant attention in both the public and private sectors (Joseph, 2015), and represents technological trend that leads the way to a new aspect in understanding modern business world and making business decisions (Kasemsap, 2017a). Big data application differs in terms of the volume (referring to quantity of data), variety (concerning the range of possible data structures), and velocity (associated with the change rate and time-sensitive usage in order to

DOI: 10.4018/IJOCI.2017070104

Copyright © 2017, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

maximize the business value) of the data involved (Moura, Batista, Cardoso, & Nunes, 2015). Big data technologies can address the problems concerning the analysis of data streams of higher velocity and higher variety (Amato, Venticinque, & di Martino, 2016).

This article focuses on the literature review through a thorough literature consolidation of big data management. The extensive literature of big data management provides a contribution to practitioners and researchers in order to maximize the impact of big data management in modern organizations.

## THEORETICAL AND PRACTICAL REVIEW OF THE LITERATURE

The literature review indicates the overview of big data management; the aspects of big data analytics (BDA); the importance of big data management; the methods for big data management; the privacy and security concerns of big data management; and the big data management in the health care industry.

### Overview of Big Data Management

Big data management is the product of individual's collective intelligence regarding various aspects of quantity, complexity, semantics, and distribution in computer science, cognitive informatics, web-based computing, cloud computing, and computational intelligence (Wang & Wiebe, 2014). Key success factors in the big data era include using internal database sources and external sources reachable online, such as blogs, social media, forums, and other data sources along with appropriate data mining (Klepac & Berg, 2015).

The big data phenomenon, concerning the volume, variety, and velocity of data, has impacted business intelligence and the use of information (Larson & Chang, 2016). Big data provides the potential for cities to gain beneficial insights from a large amount of data collected through various sources, and the Internet of Things (IoT) allows the integration of sensors, radio frequency identification (RFID), and Bluetooth in the real-world environment utilizing highly networked services (Hashem et al., 2016). IoT involves all the different devices, including computers, phones, wearable technology, and smart systems, that are able to connect to each other utilizing the Internet. (Kasemsap, 2017b). RFID is an automatic identification of packages, products, and machinery through attached transponders (Kasemsap, 2017c). RFID solutions can be utilized to reduce the operating costs through decreasing labor costs, enhancing automation, improving the tracing procedure, and preventing the material loss (Kasemsap, 2015a).

Data-intensive applications that are input/output bound have become a major workload on traditional high-performance computing clusters (Xuan, Ligon, Srimani, Ge, & Luo, 2017). Collecting huge quantities of data from the massively produced contents have enabled a new perspective on the information-related applications (Barbierato, Gribaudo, & Iacono, 2014). In recent years, big data has been used to represent a large volume of data of one type, such as text, numbers, and pixels (Kaisler, Armour, Money, & Espinosa, 2015). Big data approaches make it possible to take profit off tons of data, integrating appropriate algorithms and technologies in a unified platform (Gómez, Villegas, García, & Pedregal, 2015). Big data represents the large data sets ranging from a few dozen terabytes to many petabytes of data (Abdelhafez, 2014).

The huge volume of data that can be digitally stored significantly presents the next frontier for business organizations to increase their values (Kosala & Kumaradjaja, 2015). Enterprises need to equip themselves with relevant technology and desired skills through the challenges of big data (Wahi, Medury, & Misra, 2015). Big data visualization is not as easy as traditional small data sets. Due to the increasing volume of multiple data types, creating big data applications that can extract the valuable trends required for the additional business processes is the challenging task (Ansari,

10 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/article/big-data-management/182756

## Related Content

Evaluating Collective and Creative Problem-Solving Approaches and Tools for Wicked Problems
Ziska Fields (2021). *Handbook of Research on Using Global Collective Intelligence and Creativity to Solve Wicked Problems (pp. 41-68).*
www.irma-international.org/chapter/evaluating-collective-and-creative-problem-solving-approaches-and-tools-for-wicked-problems/266779

Enhanced Parallel-Particle Swarm Optimization (EP-PSO) Approach for Solving Nurse Rostering Problem: Enhanced Parallel-Particle Swarm Optimization (EP-PSO) Algorithm
Nagaraj V. Dharwadkar, Gautami G. Shingan, Sandeep Uttam Maneand Santosh Joshi (2022). *International Journal of Swarm Intelligence Research (pp. 1-17).*
www.irma-international.org/article/enhanced-parallel-particle-swarm-optimization-ep-pso-approach-for-solving-nurse-rostering-problem/298261

An Efficient Hybrid Evolution Strategy Algorithm with Direct Search Method for Global Optimization
Noureddine Boukhari, Fatima Debbat, Nicolas Monmarchéand Mohamed Slimane (2019). *International Journal of Organizational and Collective Intelligence (pp. 63-78).*
www.irma-international.org/article/an-efficient-hybrid-evolution-strategy-algorithm-with-direct-search-method-for-global-optimization/228204

Students' Perceptions and Acceptance: Lessons from Two Studies on Social Tools on Collaborative and Collective Learning
Yin-Leng Theng, Elaine Lew Yee Wen, Jimmy Chong Jeah Leong, Stanley See Boon Yeowand Ding Hong Yan (2012). *Intelligent and Knowledge-Based Computing for Business and Organizational Advancements (pp. 75-89).*
www.irma-international.org/chapter/students-perceptions-acceptance/65788

The ArchaeoGRID e-Infrastructure for Research, Management and Exploitation of Archaeological and Historical Heritage
Giuliano Pelfer (2014). *International Journal of Organizational and Collective Intelligence (pp. 37-44).*
www.irma-international.org/article/the-archaeogrid-e-infrastructure-for-research-management-and-exploitation-of-archaeological-and-historical-heritage/105086