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Big data : related technologies, challenges and future prospects

[Chen M.](#), [Mao S.](#), [Zhang Y.](#), [Leung V.](#), Springer Publishing Company, Incorporated, Cham, Switzerland, 2014. 89 pp. Type: Book (978-3-319062-44-0)

Date Reviewed: Nov 21 2014

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The challenges of handling the data produced by new application areas are evolving enormously in this century. The life cycle of data, the tools to handle it, the application areas in need of solutions, the application of working but immature technology, open issues, and outlooks are all topics covered in this brief, very well-structured overview of big data.

The authors' knowledge of information and communications technology (ICT) and teaching experience allow them to give a very good comprehensive overview of big data and related themes, providing a thorough and timely exploration of this broad new field. The chapters follow one another in a logical way.

First, the authors summarize the evolution of the abstract notion of big data and explain clearly its four main properties: volume, variety, velocity, and value. Next, the challenges raised are enumerated and discussed. As they emphasize in the closing "Open Issues and Outlook" chapter, this notion is rather fuzzy and qualitative; it needs more clarification, analysis, and standardization.

The next introductory chapter describes the main related organizations, networks, and technologies. Data centers, the Internet of Things (IoT), and cloud computing are explained.

The following chapters go through the life cycle of big data. Chapter 3, "Big Data Generation and Acquisition," is divided into two sections according to its title. In Section 3.1, "Big Data Generation," life cycles are treated according to the main type of data sources: enterprise, IoT, Internet, bio-medical, and other data. In section 3.2, "Big Data Acquisition," common tasks are presented: collection, transportation, and pre-processing.

In chapter 4, "Big Data Storage," different storage technologies are confronted with the sharp requirements. Recognition of too big and contradictory expectations is discussed, and work-around models and tools are described.

The next phase of data handling is to explore its value. Chapter 5 introduces different methods, aspects requiring different architectures, types, and tools of analysis.

Following the above chapters on the life cycle of big data comes the chapter about applications. In chapter 6, several applications are first grouped by data sources/types, and then by key application areas. Within the latter grouping, applications in enterprises, applications based on IoT and social networks, applications of healthcare and medicine, and applications in collective intelligence (crowd sensing and sourcing) and in managing smart power grids are discussed.

The closing chapter of the book, chapter 7, provides us with an interesting and multifaceted discussion of open issues, including theoretical, technological, management, exploration, application, and security concerns. The authors then present their vision of the development and role of big data.

Characterization of the themes is clear, precise, and brief. Each chapter starts with an abstract, and then the themes are demonstrated from many perspectives in the following sections. The chapters include extended lists of references. To save space, about 50 acronyms are used; their expansions are given in a separate register. Unfortunately, the book lacks an index. Some figures illustrate the explanations. Contrary to the precise

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text, they are drafts: components of the figures are not on the same abstraction level and seem to be low-quality grayscale copies of colored slides. Examples and case studies would have lengthened the book too much; therefore, they are not provided in this introductory overview.

By comparing this book with Michael Manoochehri's distinctly different book [1] about the same theme, I hope to provide more insight about the status of big data, these books, and their authors.

This book and Manoochehri's supplement each other in many ways. Since their themes are similar, the detailed most essential frameworks and applications are the same. The broadly applied free software tools are introduced and emphasized in both, but they also mention and describe different tools. The styles of the two books differ sharply. Besides the roles, tools, and services of the new information technology (IT) giants (Amazon, Google, Facebook, Twitter, and others), Chen et al. also refer to those that developed in the previous century (IBM, EMC, Oracle, Microsoft, and SAP are mentioned). While the authors of both books appreciate free software development projects (mainly the Apache ones), their professional backgrounds are different: the authors of this book work in university environments, whereas Manoochehri actively took part in the development of some tools at Google and for nonprofit organizations.

I recommend this introductory book, as well as Manoochehri's [2], for those who want to understand problems and solutions regarding big data.

Reviewer: [K. Balogh](#)

Review #: CR142961

- 1) Manoochehri, M. *Data just right: introduction to large-scale data & analytics*. Addison-Wesley, Upper Saddle River, NJ, 2014.
- 2) Balogh, K. Review of *Data just right*, by Michael Manoochehri. *Computing Reviews* (Aug. 26, 2014), CR Rev. No. 142656 (1411-0931).



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★ Big data computing Akerkar R., Chapman & Hall/CRC, Boca Raton, FL, 2014. 564 pp. Type: Book (978-1-466578-37-1), Reviews: (2 of 2)	Jun 6 2014

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