

# Chapter 5

## A Critical Review of the Big-Data Paradigm

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### ABSTRACT

*The moving directions of big data are readjusted with updated concerns along with the quick boom of Internet of Things (IoT). Any serious contribution to the advance of the IoT must necessarily be the result of synergetic activities conducted in different fields of knowledge, such as telecommunications, informatics, electronics and social science. Big data was a hot topic in past years. It is not a new technology, but a huge resource generated from those fields. Some of the omitted focuses become major strategic plans for developers, and several new functions are becoming critical needs for the smart Internet movement. This paper is to address big data with the strategic changes and directions during the sensitive transitional period to be recognized for the business leaders and information technology (IT) developers.*

### INTRODUCTION

It is not about the size of the data, it's what you do with it (Salkowitz, 2014). The concept of big data was hyped, some its essential properties and important attributes were omitted. The strategic concerns of big data from the business and industry circles are all about: what the trends will have an impact on global big data domain, and how big data will affect organizations in 2016 (Raijmenam, 2015). There are six top priorities of information technology development were indicated by CIO 2015 summit. They are: Business Intelligence, IT Infrastructure reconstructions, Cloud computing, Enterprises Resource

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Planning, Mobile computing, and Information Security. The term of big-data was not even mentioned. None of its hyped mass volume, the universal coverage (Atzori, 2010), its overwhelmed handling functions were addressed. Along with the fast IT innovative movement, some major misunderstandings and misconceptions are growing among the business executives, analysis, even some technology developers, and IT educators as well (Xing, 2010). The fuzzy recognitions of big-data (Chen, 2012) and its current status and moving trends triggered the concerns for this research study, and going through the review of some important big-data strategic adjustments and necessary clarifications for the future development.

## **METHODS**

This is a special review of reported information with archived data (Strang, 2013), for a purpose to organize and highlight key events in IT and Internet evolutions (Walsham, 1995) which have had a profound impact on future businesses and social human activities. Instead of going through specific needs, features, and performances of concerned analysis, this research is going to approach our targets through the discussions for the following aspects:

1. Review for the trajectories of scientific, technological development;
2. Clarifying some misconceptions from the business and industry circles;
3. Elaborating the connections between big data and information technology;
4. Summarizing the important moving trends for big-data;
5. Redefining the big-data attributes and their impacts on strategic plans.

## **LITERATURE REVIEW**

To review the critical concerns of big data development, it is imperative to clarify some misconceptions and the historical process of digital evolutions.

### **The Revolutionary Stages of Science, Industry and Technology Development**

During past few years, the term of big data was hyped (Snijders, 2012) and described inappropriately. One of typical sayings was the so-called “big-data stage” or called “big-data revolution”. It misled people that as if we were jumped into a brand new digital era with a revolutionized technology of big-data which was just discovered, and invented.

Look back the contemporary human history, the world has gone through five scientific, industrial and technological revolutions. The publication in 1543 of Nicolaus Copernicus’s Heliocentric Theory which was the first breakthrough *theory* that said that the universe does not revolve around the Earth; instead we revolve around the sun. His theory was physically proved by Galileo Galilei’s observational astronomy and theoretically explained by Newton’s law of universal gravitation. The period with these significant scientific achievements is often cited as marking the beginning of the first scientific revolution. In early 20<sup>th</sup> century, the most famous scientist Albert Einstein’s relativity theory reinterpreted the inner workings of nature, the very essence of light, time, energy and gravity. His insights fundamentally changed the way

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