Chapter 58
The Impact of Big Data Analytics and Challenges to Cyber Security

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ABSTRACT.

In order to scrutinize or evaluate an extremely high quantity of an ever-present and diversified nature of data, new technologies are developed. With the application of these technologies, called big data technologies, to the constantly developing various internal as well as external sources of data, concealed correlations between data can be identified, and promising strategies can be developed, which is necessary for economic growth and new innovations. This chapter deals with the analysis of the real-time uses of big data to both individual persons and the society too, while concentrating on seven important areas of key usage: big data for business optimization and customer analytics, big data and healthcare, big data and science, big data and finance, big data as enablers of openness and efficiency in government, big data and the emerging energy distribution systems, and big data security.

INTRODUCTION

Big data analysis has not been entirely new to the world as it has been around the corner and discussed by a lot of analytics. Though it is been viewed or thought to be a highly sensitive buzzword, big data analytics is just a means to bird's view of extremely large data to identify concealed patterns, new correlations, preference of the customers, marketing trends or priority, and other business-related information. Various business corporate structures are bound to take a leap in their decisions to maintain their stand in the highly competitive business world and they have to definitely control their data to develop strategies that can be put into actions (Xia, Liu, Lee, & Cao, 2016). The last few years have seen a major

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explosion in the quantity of data and the variety of it generated by individuals and about them. Such a huge data is easily copied at a very low price and is conveniently stored in public databases where they are easily accessed through the Internet.

As per the IBM estimation which is released recently, an awesome amount of 2.5 billion Gigabytes (GB) of data are produced every day all of the world and this volume are ever growing every minute. And what more to add to this along with the Web 2.0 applications, the literally baseline cost of computational storage, the fast-evolving of entirely new range of computing prototypes like cloud computing, the field of artificial intelligence and data mining which is in the process of major breakthrough innovations (Li, Tang, & Xu, 2016), all of which join hands with an extremely wide range of sensor endowed and Internet-friendly mobile instruments helps greatly in enabling the big data phenomenon on itself. The term big data by itself still do not have a strict definition but is widely used to explain the magnanimous development and feasibility and the varied nature of data and the rate of momentum at which these data (different nature, format, and origin) are created and transported.

The NIST (National Institute of Standards and Technology) promoted a feasible definition for big data in cooperate with major areas like Velocity (data speed), Volume (data volume), and the Variety (data source). Big data is entirely different than conventional data warehousing and the other areas of analysis (Jiang & Wang, 2016) of business intelligence which has been in the scenario for quite some time. An unsurpassable amount of big data is quite unstructured and they comprise of literally raw data which is created with an increasing speed unlike anything earlier.

Today's real-time analysts are continuously able to wring out highly difficult patterns, identify correlations and pull out information that is valuable from collections of real-time data which are the cross-domain in nature. This is done with the use of technologies that are high in performance, storage infrastructures that are nominal in pricing, statistical correlation algorithms and strong techniques in data mining (Bhatt, Dey, & Ashour, 2017). The examples of big data sources are quite rich and varied in nature. They range from big corporate companies' Intranets, government directories which are online, the enormous search data, mobile communication finds, the users' data of their live interactions on social communication platforms, as well as the cyber physical systems like the ITS or intelligent transport system, smart energy distribution, smart cars, ultra modern home equipments which merge into the various home entertainment needs as well as domestic appliances to house security devices which have applications that use face, emotion recognition and motion detectors (Shrivastava et al., 2011).

This is a fast-growing trend which is highly used in various services which affect our day to day life and has a great impact on the socio-economic scenario. The big data analysts are derive and relate algorithms and make use of the artificial intelligence which uncovers concealed insights from a large amount of collected data for different areas of life. They range from decision optimization from the given data which can be utilized in the police force by the practical strategic assessment which helps to decrease the public crimes, and in the medical environment, patient's hazard to certain diseases are calculated along with the spreading of contagious diseases. It also helps to understand the nature of human reactions and consequences in typical socio-technical situations. These days the acquiescence of data is a form of currency and is a rich and rare commodity. The holding of such big data reduces to face new privacy challenges of individuals and society in whole as these accumulated data are linked to other databases as well. Based on this big data, its storage, analytics, and decisions which are automated through computational algorithms make a heavy impact on individuals and society and it also poses a great threat to the basic rights on various platforms like unfair discrimination, prejudicial outcomes, and many personal issues.