# Chapter 17
# Security and Privacy Challenges in Big Data Environment

**M. Manikandakumar**
*Thiagarajar College of Engineering, India*

**E. Ramanujam**
*Thiagarajar College of Engineering, India*

## ABSTRACT

*In this information era, big data is revolutionizing business. The data are generated by each and every user from servers, terminals, smart phones, appliances, satellites, and a range of other sensors on vehicles: military, agriculture, and the like. Anything the end users does online can be traced, stored, and analyzed. It is also possible to analyze from various diverse sources such as social media postings, credit card or e-cash purchases, internet searches, mobile phone locations, etc. Users are willing to provide their private information, linked to their real-life identities, in exchange for faster or better digital services. But, the companies yet may not have the fundamental rights of the user from a security perspective. More risks are associated with big data security. The main purpose of this chapter is to explore the security concerns and privacy issues in big data environments.*

## INTRODUCTION

Almost all industries largely implementing the concept of Big Data to store peta bytes data for analyzing, marketing and research based on users perspective to earn superior insights concerning the customers and their business. Since many industries noticed that, storing confidential or private information of the end users in cloud storage (Manikandakumar et al., 2015) or in the dedicated server, those companies have the sole responsiveness for protecting private data from both a legal and a commercial perspective. As with all the new technologies, security and protection seems to be addendum at best. As the definition of Big Data (Gandomi & Haider, 2015), the breaches are also too large, with the possibility of high severe reputational hurt and legal consequence than these recent times.

The new types of data in the organizations that need to analyze the following.

- Web streams such as e-commerce, weblogs and social network analysis data.
- Business specific transaction data like Tele Caller records, Geo-spatial data, Temporal and Customer Relational Transaction data.
- Data generated from various types of sensor such as motion, weather, energy, wind, humidity, vibration, airflow, liquid flow, pressure and health-oriented sensors.
- Textual data from the large volume of archived documents, external sources or customer interaction data, e-mails, messages, and tweets.

According to a study by the Economist Intelligence Unit (Unit, 2007)

- Nearly 90% of Industrial experts and business leaders believe that the data is now the raw and fundamental source of production to business such as land, labor, and capital.
- Using Big data in businesses improves the performance by 26% and it is predicted that it may grow up to 41% in next few years.
- 58% of business sectors say that they are planning to increase the investment in big data over the next three years.

According to Gartner (Beyer, 2011)

- About 42% of Information Technology experts stated that, they had invested in big data technology or were planning to do so within a year.
- Organizations those integrate large volume, various information types and sources into a rational information management communications will outperform their industry peers by more than 20%.

## Four V's

Big data involves the "four Vs" for the efficient storage of data - volume, velocity, variety and the value. When defining the Big Data it is common to discuss the three major V's: Volume, Velocity, and Variety.

### Volume

The main characteristics of "Big" are the absolute volume of data to be stored. There is no effect focusing on minimum storage as the technology and the information utilized to rapidly increasing in a fraction of time even in seconds or lesser. Thomson Reuters (2010) quoted in their 2010 annual report that, the world was "awash with over 800 Exabyte of data growing". Likely another data storage company named EMC reveals it was about to 900 Exabyte and might raise up to 50% per every year.

### Velocity

Big Data Applications used in research (Swan, 2013), telecommunications (Hashem et al., 2015), emergency care (Ramanujam et al. 2016; Padmavathi et al. 2015), Agriculture and the like has given much more attention to handling both real-time and simulated data for data access and processing. At the same time frequently received in a series manner also has to be processed. For an example, in telecommunica-

9 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/chapter/security-and-privacy-challenges-in-big-data-environment/201619](http://www.igi-global.com/chapter/security-and-privacy-challenges-in-big-data-environment/201619)

## Related Content

Cyber Security Policy in India: Examining the Issues, Challenges, and Framework
Kush Kalraand Bhanu Tanwar (2023). *Cybersecurity Issues, Challenges, and Solutions in the Business World (pp. 120-137).*
[www.irma-international.org/chapter/cyber-security-policy-in-india/313863](http://www.irma-international.org/chapter/cyber-security-policy-in-india/313863)

The Role of Privacy Risk in IT Acceptance: An Empirical Study
Joseph A. Cazier, E. Vance Wilsonand B. Dawn Medlin (2007). *International Journal of Information Security and Privacy (pp. 61-73).*
[www.irma-international.org/article/role-privacy-risk-acceptance/2461](http://www.irma-international.org/article/role-privacy-risk-acceptance/2461)

The Business Transformation Framework and Enterprise Architecture Framework for Managers in Business Innovation: The Role of Cyber and Information Technology Security in Automated Business Environments
Antoine Tradand Damir Kalpi (2019). *Global Cyber Security Labor Shortage and International Business Risk (pp. 19-37).*
[www.irma-international.org/chapter/the-business-transformation-framework-and-enterprise-architecture-framework-for-managers-in-business-innovation/213444](http://www.irma-international.org/chapter/the-business-transformation-framework-and-enterprise-architecture-framework-for-managers-in-business-innovation/213444)

Adaptive Deep Rider LSTM-Enabled Objective Functions for RPL Routing in IoT Applications
Chaudhari D. A., Dipalee A. Chaudhari, Umamaheswari E.and E. Umamaheswari (2022). *International Journal of Information Security and Privacy (pp. 1-17).*
[www.irma-international.org/article/adaptive-deep-rider-lstm-enabled-objective-functions-for-rpl-routing-in-iot-applications/285583](http://www.irma-international.org/article/adaptive-deep-rider-lstm-enabled-objective-functions-for-rpl-routing-in-iot-applications/285583)

Computer Security in E-Learning
Edgar R. Weippl (2008). *Information Security and Ethics: Concepts, Methodologies, Tools, and Applications  (pp. 2492-2499).*
[www.irma-international.org/chapter/computer-security-learning/23234](http://www.irma-international.org/chapter/computer-security-learning/23234)