Big data-based frameworks for healthcare systems

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3.1 Introduction

Currently, the domain of big data has rapidly grown up where massive volumes of data are produced from various sources. As a result, big data is getting ever more popular by extending into several forms such as eHealth, mHealth, and the Internet of medical things (Firouzi et al., 2018). Big data and healthcare systems have been closely interrelated with the help of advanced and sophisticated technologies. Big data has ample potential to offer various healthcare functionalities such as disease observation, medical decision support, and patient health monitoring. Therefore, effective big data-based healthcare systems are required to observe patient symptoms and identify clinical decisions by medical officers and physicians. Similarly, healthcare systems normally keep large amounts of data produced by patient clinical records, compliance and governing desires, and patient care. The conventional data-processing techniques, frameworks, or algorithms are unable to deal with large volumes of big data (Hossain & Muhammad, 2016).

Today, there is a paradigm change in healthcare that has seen a shift from cures to early detection and prevention of diseases (Kim & Seu, 2014). In healthcare, big data has the power of analytical capability to extract the hidden patterns, unseen links, insights, predictions, and various trends from big volumes of data from varied data sources. Accordingly, recent developments in healthcare such as patient electronic health records as well as the integration of smart health, mHealth, and eHealth devices have helped the expansion of innovative healthcare systems that enable medical precision and tailored healthcare solutions. Recent advancements in the Internet of medical things and cloud servers can regularly collect transmitted data that can be handled and processed by machine learning and big data analytic techniques (Syed, Jabeen, Manimala, & Alsaeedi, 2019). Further, healthcare datasets are complex in nature and are strongly intertwined. Thus, activities such as simplifying the difficulty in data, recognizing the interlinks among numerous healthcare factors, and the