LITERATURE SURVEY

ABSTRACT:

The current study performs a systematic literature review (SLR) to synthesis prior research on the applicability of big data analytics (BDA) in healthcare. The SLR examines the outcomes of 41 studies, and presents them in a comprehensive framework. The findings from this study suggest that applications of BDA in healthcare can be observed from five perspectives, namely, health awareness among the general public, interactions among stakeholders in the healthcare ecosystem, hospital management practices, treatment of specific medical conditions, and technology in healthcare service delivery. This SLR recommends actionable future research agendas for scholars and valuable implications for theory and practice

KEYWORDS:

- Big Data
- Analytics
- Healthcare
- Hospital Management
- Medical Informatics
- Systematic literature review: covid-19

INTRODUCTION:

Balamurugan 2016; Weng and Kahn 2016 Healthcare enterprises search for suitable technologies to streamline resources for the sake of improving the patient experience and organisational performance (Tang et al. 2019; Wang, Kung, and Byrd 2018; Tandon et al. 2020). Healthcare can be conceptualised as a system comprising three constituent parts: (a) core providers of medical care services, such as physicians, nurses, technicians, and hospital administrations (Boudhir, Ben Ahmed, and Soumaya 2017; Zhang, Simon, and Yu 2017); (b) critical services that are associated with medical care services, such as medical research and health

insurance (Austin and Kusumoto 2016; Chandola, Sukumar, and Schryver 2013); and (c) beneficiaries of medical care services, i.e., patients and the public (Salomi).

Big data in healthcare:

Applications of BDA in healthcare are gradually increasing with the growing volume of big data in this context (Galetsi and Katsaliaki 2019; Kamble et al. 2019). Among the possible sources of big data in healthcare are heterogeneous and multi-spectral observations, such as patient demographics (Malik, Abdallah, and Ala'raj 2018), treatment history (Ozminkowski et al. 2015), and diagnostic reports (Amirian et al. 2017). Mehta and Pandit (2018) suggest that such data may be structured (e.g., genotype, phenotype, or genomics data) or unstructured (e.g., clinical notes, prescriptions, or medical imaging). Implementing data in healthcare often requires the generation and collection of real-time data (Tang et al. 2019) of high quality (Wang, Kung, and Byrd 2018). Decision-makers in healthcare organisations are able to take meaningful action based on valuable insights derived from big data (Prasser et al. 2019; Wang, Kung, and Byrd 2018). Healthcare organisations deploy technologies to cope with the changing nature of big data (Harerimana et al. 2018; Zhang et al. 2015). Moreover, big data in healthcare can be employed to connect different fields to comprehensively study a disease (Zhang, Simon, and Yu 2017). In sum, all of the characteristics of big data mentioned above are observable in the context of healthcare.

Methodology:

The protocol for the current SLR, as presented in Figure 1, is comprised of three sequential processes: planning the review, performing the review, and presenting the review (Behera, Bala, and Dhir 2019; Tandon et al. 2020). The present SLR includes preset inclusion and exclusion criteria (see Figure 1), as recommended by prior literature (Behera, Bala, and Dhir 2019; Tandon et al. 2020).

Planning the review:

First, appropriate keywords were identified to search for relevant studies in the databases. This SLR focused on four databases: Scopus, Web of Science, PsycINFO, and PubMed. These databases are reportedly the most important sources for studies related to medical health informatics (Behera, Bala, and Dhir 2019; Tandon et al. 2020). Full texts of the studies that appeared relevant were screened for eligibility. Next, studies meeting the eligibility criteria (namely, the inclusion and exclusion criteria) were assessed for quality and robustness.

Applications of BDA in healthcare:

Health awareness

This theme involves different facets of general awareness of the holistic health and well-being of patients. For instance, prior studies on health awareness discussed health insurance (Chandola, Sukumar, and Schryver 2013), living environment (Jin et al., 2016), and sports behaviour (Tseng et al. 2017), among other topics. Chandola, Sukumar, and Schryver (2013) suggested that insurance claims data reveal important insights about the prevalence of fraudulent activities in healthcare. Jin et al. (2016) proposed that cyber technologies can provide a safe and secure living environment for the elderly. Tseng et al. (2017) identified that personalised healthcare apps might analyse users' sports patterns and trends of heart rate change during exercise.

Healthcare ecosystem

This theme captures the dynamic relationships among stakeholders in the healthcare ecosystem in managing hardware resources (Koliogeorgi et al. 2017), device networks (Jindal et al. 2018), data warehousing (Sabharwal, Gupta, and Thirunavukkarasu 2016), and other facilities required for reaping the benefits of BDA (Wang, Kung, and Byrd 2018). Koliogeorgi et al. (2017) suggested that parallel execution of accelerated kernels delivers remarkable speed and scalability. Jindal et al. (2018) proposed the possibility of classifying big data generated from device networks in healthcare. Sabharwal, Gupta, and Thirunavukkarasu (2016) highlighted that BDA might revolutionise many aspects of healthcare, such as patient profiling, genomic analysis, and monitoring. However, the capabilities

required for implementing big data analytics impact transformation practices in healthcare (Wang, Kung, and Byrd 2018).

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