**To what extent is it a challenge for healthcare organisations to make effective use of big data?**

               Big data plays a critical role in enhancing the performance of the organisations because it promotes patients wellness, cost reduction in healthcare, enhances visibility into performance and contributes to greater satisfaction of the patients and the staff (Fatt & Ramadas, 2018, p 9). The big data can be used to improve database for treatment, diseases, epidemiological research and reduce the cost of medical treatment (Ibid). Healthcare organisations are involved in various activities centred to promote the health of the patients. They comprise of different components responsible for the specific function, and the interactions of these components create a multi-varied data flows that result in health information system (Zhang *et al.,* 2018). This essay aims to demonstrate that healthcare organisations face myriad of challenges such as incompatibility of the storage systems, protecting details of the patient and inadequate specialist staff and technology. These challenges affect management and utilisation of big data in the healthcare organisation. The paragraph which follows will begin by addressing the challenge of Separate storage of healthcare data. Secondly, will moving to obstacle for the challenge of patient’s privacy. Finally, there will be examination of the challenge of Specialist staff and technology which some of the healthcare providers lack the knowledge and the skills require managing and sharing data in various sources.

 The complexity and bulkiness of big data in healthcare organissations creates challengges of collecting, storing, analysing and disseminating the data to the relevant staff members, pateints and other relevant stakeholders. The healthcare organisations use data for different purposes including handling patients claims, providing treatment, administrative funcitons, quality control and assessment of performance (González-Ferrer *et al*., 44-45). Organisations have to capture complete, clean and accurate data that can be stored and used in multiple systems to ensure it is available for use by the different users (Escalera & Azcárate, 2017; 55). The complexity of handling big data results in segmentation of data which is stored in separate storage systems for various uses. Separate storage of data increases complexity of handling and utilizing the data because it increases inefficiency of accessing the data, could result in duplication of diagnostic tests, slow communication or sharing of information by the frontline clinicians and patients, and undermines decision-making process (Zhang *et al*., 2018; 14). Studies have shown that keeping segmented data in silos in various departments within healthcare organisation has continued to undermine the optimal application of big data to improve the quality of services to the patients. However, if used effectively big data can streamline the functions of healthcare organisations, enhance their performance and improve customer experience. In most cases organisations lack the relevant knowledge and ability to manage the information systems and share the information in effective way. The information exists in data segments held by various departments that effect of sharing information among all frontline clinical service providers to enhance services delivery (White, 2014). Organisations should combine various data to reduce cost, enhance innovativeness and decision making by the service providers and improve quality of services to the patients. The organisations can use data warehouses and decision support systems to circumvent the challenge of incompatibility of data storage system and establish a single source of data for the entire organisation.

 The second challenge undermining the effective use of big data in healthcare organisations involves securing the patient's privacy. The number one priority of healthcare organisations is to protect clients’ information from security breach. There are increasing security challenges due to hackings, rapid-fire and ransomware episodes among others. Organisations are have to put various security measures in place and comply with Health Insurance Portability and Accountability Act (HIPAA) security rules to safeguard clients details (White, 2014, p4). This Act addresses the covered entities and the type of client’s information that require protection. The rules for securing clients details involve using appropriate procedure such as use of data encryption, multi-factor authentication, up-to-date anti-virus softwares and firewall to safeguard the data. Healthcare organisations share information with various stakeholders such as payers, providers, and public health organisations. Lack of coding technology has lead in the different coding of clinical terms which create difficulties in sharing information. The healthcare organisations should share patient’s information without revealing the identifying details. However, the organisation experience challenges of de-identifying the patients while maintaining the quality and credibility of the information before share the information (Escalera & Azcárate, 2017). Some of the identifying elements such as date when and place where the clinical study was done are very essential in healthcare for longitudinal care studies (White, 2014; p5). Sometimes organisations might be forced to hide the details of the patients and this could affect quality of the data that is required for decision making. For instance, *t*he requirement by Health Insurance Portability and Accountability Act to de-identify the data for safer transformation is issue for a clinical study involve time elements such as the study of mortality rates or readmission rates 2017). In most cases, researchers rely on baseline date that could give us the general the outcome of the study in case the medical practices or treatment methods challenges with the time. Furthermore, the integration of technology and increasing independence of the patients to take active role in entering their data and access personal health records via the internet and other devices has increase the complexity of healthcare organisations to leverage on big data to enhance their performance (White, 2014; p5). Most patients are involved in the active role of registering personal information and accessing personal records the healthcare organisations are the responsibility for protecting the patients. There is increase temptation in the healthcare organisations to use those patients’ details on the social networks, but they cannot break the duty to protect the patient privacy. Therefore, healthcare must control the information they share to enhance business performance.

 Thirdly, lack of specialised knowledge and technology to manage complexity of big datasets in the healthcare organisations is big hindrance to effective utilisation of the available data to enhance organisation’s performance. Furthermore, lack of adequate accepted medical terminology system has contributed to coding of clinical terms that have created difficulties in sharing of information (Zhang *et al.,* 2018; p16). The various categories of datasets require specialist knowledge for accessing, processing, storing and sharing of information to enhance the quality of healthcare without affecting the quality of information or privacy of the patient. The big data in healthcare organisations occur in three categories. The first category is traditional healthcare data that is create and stored within the health system (Escalera & Azcárate, 2017; p56). The second is “Omics” data which is large-scale datasets involving biological and molecular studies such as the behaviour of diseases. The third category data available in the social media relate to the use of the internet, social media and various technology-based tools and applications that provide information on how to improve patients wellness (González-Ferrer et a; p43). However, most of clinical staff have experience or technical skills for handling data efficiently.

 In conclusion, the complexity of big in healthcare organisations creates various challenges to the organisation. The data is obtained from different sources and stored in separate systems because of inadequate systems to integrate all the available without undermining its quality and application. Also, as the data becomes more complex so is the need to establish security measures to protect clients’ privacy. Furthermore, inadequate knowledge for effective data management and low technical skills to manage big data continues to undermine effective use of big data. Furthermore, the challenges of big data storage and management in healthcare organisations are many and require the organisation to improve the skills and competence of managing the data. They should focus on handling the privacy of patients, promote collaboration of datasets available in various departments and enhance technology and skills of the providers. Effective management and utilization of big data can give healthcare organisation competitiveness through the sharing of information with relevant stakeholders.

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