Chapter 5
The Much Needed Security and Data Reforms of Cloud Computing in Medical Data Storage

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ABSTRACT

Cloud computing has shifted our old documents up into the clouds, with the advancement of technology. Fast-growing virtual document storage platforms provide amenities with minimal expense in the corporate society. Despite living in the 20th century, even the first world countries have issues with the maintenance of document storage. Cloud computing resolves this issue for business and clinic owners as it banishes the requirement of planning, provisioning, and allows corporations to advance their filling system according to service demands. Medical practices heavily, rely on document storage as; almost all information contained in medical files is stored in a printed format. Medical practices urgently need to revolutionize their storage standards, to keep up with the growing population. The traditional method of paper storage in medical practice has completely been obsolete and needs to improve in order to assist patients with faster diagnosis in critical situations. Obtaining Knowledge and sharing it is an important part of medical practice, so it needs immediate attention to reach its full service potential. This chapter has analyzed content from literature that highlights issues regarding data storage and recommends solution. This inquiry has found a useful tool that can be beneficial for the development of this problem which is, 'data mining' as it gives the option of predictive, and preventative health care options, when medical data is searched. The functionality and worthiness of each algorithm and methods are also determined in this study. By using cloud and big data services to improve the analysis of medical data in network of regional health information system, has huge advancements that assure convenient management, easy extension, flexible investment, and low requirements for low technical based private medical units.

INTRODUCTION

Cloud computing has become one of the fastest emerging techniques in the area of information technology. Information technology has started to gain interest due to population increase and virtualization of documents in a business environment, as it gives possible solutions to this rising problems. Organizations need a sustainable filing system that copes with current demands to solve this issue, in order to serve their clients better and faster. The technology of cloud computing provides a few number of benefits. Firstly, it is convenient, with a common shared infrastructure that provides servers with storage disks, networking components with wires, switches, hubs, and routers. Secondly, the implantation of cloud allows medical related information to be available over the Internet; thereby rendering this information to make it accessible is evolutionary. A huge number of people who use the Internet inspire to reach this ultimate goal. Storage of data, with secure confidentiality, and analysis of the stored data has three important aspects that make cloud computing easy to manage.

Firstly, the information collected in the medical field is referred to as "raw data". This data is stored in the data warehouse for future use or analysis. This Data Warehouse is a collection of databases where volumes of data are stored, then used when needed. Here, the collected data can be stored both in structured and unstructured format. To convert the unstructured data into a structured format, the data needs to be clustered. In addition to the k-means cluster algorithm for clustering the unstructured data into some structured format is also revolutionary. Once the data is clustered, then we will get various patterns that are then subjected to analysis. This enhances the analysis phase by allowing various interesting patterns to rise, and consequently data is abstracted. The aforementioned Fuzzy logic technique is one of the most common methods used for the decision-making process during the analysis.

Additionally, in cloud computing, one of the major issues is security and confidentially of sensitive data. To overcome the security problems of data storage in cloud is to use an encrypted format that makes it hard for hackers to interrupt, and understand. Next, we reviewed the studies in related area about big-data clustering and analyzed cloud computing techniques in relevant medical decision-makings situations. Considering a vast amount of medical data that has been available on the Internet, the easy retrieval of data is helpful to health service providers, and particularly for specialists who need to identify diseases in depth in a limited timeframe.

Once medically relevant data has been collected from networks, it then needs to be stored in a database to precede data analysis (i.e. clustering approach) this process allows users to obtain required information. The current system allows medical organizations to share their confidential information through the Internet, and causes leaks of confidential data. The current system also does not provide sufficient techniques or functions to secure confidential data while transmitting it through the Internet. In lieu of health service providing, organizations that have faced problems when analyzing the required information about a particular medicine or disease through the Internet will also benefit from this function. To avoid these issues in the "medical data security" field, this chapter proposes a technique that will help to organize collected information from the Internet securely. This highlighted method would help these advanced algorithms to share information with others while sustaining confidentiality. Furthermore, K-means technique is used to cluster big data from the database to retrieve required medical information. Some of the necessary steps involved in Parallel clustering algorithms are based on k-means in big data; this is displayed as follows: (i) Centroid-based clustering, (ii) Density-based clustering (iii) Connectivity-based clustering, (iv) High-dimensional clustering, (v) Similarity-based clustering, and (vi) Co-clustering.

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