Cloud Computing Impact on Healthcare Services During COVID-19 Pandemic

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Abstract

Since last few months the World is facing the pandemic Covid-19. To prevent the spreading of disease at community level. Presently, world have only one solution i.e. isolation. This isolation made our physical world geofenced to our home and short neighbourhood walks. Our life has become virtual lives and the array of physical realities are replaced with virtual tools to transform our social interactions. The aim of present article is to discuss various functionalities and role of cloud computing in healthcare during Covid-19 Pandemic. The cloud computing is the incipient technology that empower the healthcare warriors to perform their daily operations without human interference especially during Covid-19 outbreak. The purpose of this article is to cumulate existing research and published data which address the current challenges in healthcare and possible solutions that can derived from cloud computing.

Keywords: Cloud computing, Telemedicine, Electronic Health Records, Artificial Intelligence

Introduction

The health-care sector is swiftly rising, its usage and importance are also growing in the era of pandemic situations. It also plays an important role in world’s economy. Use of heavy technology including the social media has made this area very meaningful. Healthcare industry worldwide revolutionized by the technological advances by using the modern testing techniques to improved surgical equipment, remote health monitoring technologies with the help of modern digital equipment, etc. There are many online healthcare portals. These portals provide the information about patients in a secured way. Data Science, Big Data, Analytics, and Cloud Technology can be used in healthcare to significantly improve a hospital’s IT Energy Efficiency along with information on the best ways to improve energy efficiency for healthcare in a cost effective manner.
The rapid innovations in virtualization and distributed computing, as well as improved access to high-speed Internet, have accelerated interest in cloud computing. In the new information technology (IT), cloud computing provides technique to perform the healthcare service in a tactful manner and decrease carbon dioxide path which also reduce the cost of information technology (IT), and on the basis of demand it deliver computing services.

During the Covid-19 Pandemic the Clouds have enabled us to join our digital lives through applications like Zoom Video, Skype, YouTube etc. Several cloud service providers available such as Amazon Web Services, Microsoft Azure, Google cloud are providing their services to reduce the stress by using prime videos, providing safety measures to help healthcare organizations, researchers and patients to navigate and provide such platforms of communication, safety concerns, help them and to treat them.

The Novel Corona virus (Covid-19) is causing a huge number of deaths as compared to SARS 2003 and giving no indications of containment, the sickness is out of control and this is the time to move on to the innovation and made possible efforts to control on the pandemic situation. The virus affecting the human beings, by changing their day-by-day activities and lives. The cloud computing is the best solution to adopt to ingest, process, analyse, sharing big data, using interoperability and scalability procedures in a cost effective manner. With the spread up of the disease and the incidence of this epidemic situation the HealthCare Stakeholders are continously moving on to promote the use of technology and are in search of new digital tools to help HealthCare workers to fight against this pandemic situation and to control the disease.

**Deployment of Cloud Computing against Covid-19**

Cloud Computing is playing a more prominent role in healthcare information technology as an idle feature i.e. expected to accelerate in near future. In the Coronavirus outbreak fight cloud computing has joined the force of disruptive technologies at HealthCare Services to perform better pandemic control. Many of the IT based companies deployed their research to identify chemical compounds that could contribute to fight against coronavirus. Cloud computing also accommodate remote work or to run more workloads on the public cloud if data centers are facing storage space reductions. Many health cloud providers providing a platform to control Covid-19 pandemic with the rise in the use of digital epidemiology tools, EHR guidance tools, and testing tools kits.

Joint actions taken by HealthCare organizations, government and digital health vendors like Google Cloud to provide their services for healthcare organizations as well as their employees to control the pandemic situation.
Deployment of Cloud Computing in Healthcare during Covid-19 Pandemic

- **Virtual Care and Telehealth**: This service is provided for the patients to support them from remote areas. In this service the patients are offered services by health workers to take home devices, monitoring health digitally and set up virtual visits by health experts. This is a service provided by google cloud as an application G suite which is specially works for healthcare businesses. This service gives fast, efficient service to patients while virtual meeting with the strict requirements of regulations like Health Insurance Portability and Accountability Act (HIPAA).

- **Mobile Healthcare**: Mobile health based on mobile technologies enable health research and delivering of health services in far flung areas. This service is used to keep the information of the patients in Google Docs, and the large voluminous sheets and files are stored on Drive at cloud. It allows to access and update the information from anywhere using Laptops, tablets or Smart phones. Using this service health experts are able to face and get more time for remote patients by Google Hangouts for video conferencing.

- **Critical application and website infrastructure**: Now-a-Days many healthcare Covid-19 related and government websites are facing traffic issues and downtime problems. Therefore in the response the Google clouds are providing network services of content delivery and also clouds are scaled to store large amount of data.

- **High Demand public Health datasets**: Clouds are also helpful to store the public healthcare datasets of Covid-19 to analyse the data by experts and help healthcare organizations to make decisions.

- **Remote work solutions**: Clouds are also helpful to connect with healthcare and lifesciences workers instantly. Whether these workers are on the front line of care they lead the research remotely.

- **Telemedicine**: This technology is used in US and many more countries world wide to safely screen and treat the patients from remote areas. Recently, the Rush University Medical Center in Chicago has developed a set up for virtual medical line which will be helpful to screen patients for coronavirus.

- **Autonomous vehicles and drones**: These are being used to deliver and supply essential goods like medicines and foodstuffs to the patients so that human interaction can be minimized. China’s largest private courier, SF Express, is using robots or drones to transport medical supplies to Wuhan Jinyintan Hospital in China’s Hubei province. Drones are also being used to patrol public spaces, keep track on non-compliance to quarantine mandates and for thermal imaging.
Apollo, Baidu’s autonomous vehicle platform, has merged hands with self-driving start-up Neolix to deliver supplies and food to a big hospital in Beijing. It has made its micro-car kits and autonomous driving cloud services which are available for free to companies fighting the virus.

AI is helping in diagnosing and developing a cure for the illness. The supercomputers and cloud computing resources of several major technical companies such as Tencent, DiDi, and Huawei are being used to fast-track the development of a cure or for vaccine for the coronavirus.

Several Mobile apps are launched by the government to provide information, government guidelines, safety measures about the disease. Recently the Indian government with the help of Ministry of Electronics and Information Technology has launched an app AarogyaSetu for smart devices which help the people to track every necessary information related to the coronavirus. The app also helps to find and track patient nearby ones place, and safety measures one should follow, wheather you are in safe zone or not. Soon the app will also release E-pass for the people. This app is maintained by using cloud services which access the user with its connectivity through clouds using their smart devices like mobile phone, laptops, tablets etc.

Conclusion

The recent COVID-19 pandemic made very quick and impactful changes in our lives in many ways. With the raise of this pandemic day by day implication of cloud computing technology is incresing in healthcare domain in every part of the world. The resaons behind deployement of cloud computing in healthcare services are discussed above. Cloud computing enables physicians to stay in touch with their patients and diagnose their health condition in very economic manner during the coronavirus pandemic where social distancing is utmost required. Cloud computing in healthcare is at initial stage where concern regarding the security and other data issues are also existing but still with the deelopment of information technology (IT) and artificial intelligence (AI) in healthcare these issues will also solved on later stage. For the solidarity and global approach in healthcare research and development cloud computing plays vital role in the present COVID-19 pandemic.
References


