Cloud Computing in Healthcare

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Outline

Introduction

These days the management of data is becoming more and more diverse, developed, and easier for users. There are lots of computer system resources used to store, manage and share data, which are used in different spheres of life such as finances, education, healthcare and others. Cloud computing is one of the recently invented computing services that delivers data over the Internet. Since it functions virtually, it has many advantages for users; therefore, we are interested in investigating this service's usage in one of the most significant spheres of society's life – healthcare. The purpose of this research report is to present the main information about cloud computing, which became a shift from traditional methods used in data management, along with its pros and its impact on a healthcare.

What is Cloud Computing

The term "Cloud Computing" was firstly introduced in 1996. According to the NIST (The National Institute of Standards and Technology), Cloud Computing is a concept for offering ubiquitous, practical, on-demand network access to a shared pool of reconfigurable computing resources, which can be quickly deployed and released with little management work or service provider involvement.

There are four types of clouds:

- Public cloud – it is available to the public in a pay-as-you-go manner.

- Private cloud – it is used by private organizations or businesses.

- Community cloud – it is shared by some enterprises and enables a specific community with shared objectives, such as mission, security specifications, policy, and compliance considerations.

- Hybrid cloud – combination of two or more different types of clouds.

What is Cloud Computing

Cloud computing has such features as:

- Availability of infinite computing resources on demand;

- Allowing companies to expand hardware resources in case of growth in their wants and needs;

- Allowing users to pay for a short-term usage of computing resources.

Models of CC

- **I)Software as a Service (SaaS):**

  - It is regarded as a software licensing and delivery paradigm where the user can access the software using a web browser and the software is centrally hosted and licensed on a subscription basis. Another name for it is "on-demand software."

- **II)Platform as a Service (PaaS):**

  - On the servers of the service, it offers a collection of software and development tools. PaaS apps are typically referred to as web-based and on-demand. Compared to SaaS services, PaaS services offer a customizable platform.

- **III)Infrastructure as a Service (IaaS):**

  - Through the internet, it distributes virtualized computing resources including networks, storage, and processing.

Benefits of CC

All computing resources are managed by the 3rd party providers;

There is no need for users to invest a large amount of money. Users pay not for the service, they pay for the resources;

Flexibility of resources;

Access to resources anywhere and anytime;

Faster and more effective upgrade and other technology advancement implementation;

More scalable tools for testing, development, and research.

Impact on Healthcare

Collaboration between medical staff, patients, and other relevant parties is supported appropriately by cloud computing. Numerous issues in the healthcare industry can be resolved with it, including resource optimization, cost reduction, and storage capacity. Improved medical data availability, recovery, and transmission, as well as quick access to medical records, are all related to cloud computing. In order to manage and facilitate easy access to hospital data from mobile devices inside the hospital, for example Yoo et al. used virtualization technology with 400 virtual machines to build a cloud computing in Bundang Hospital of Seoul National University in Korea. Hospitals, on the other hand, deal with a lot of medical data that must be kept on file for a long time, even after the patient has received treatment. Regarding this problem, the adoption of cloud-based applications in healthcare can address the difficulty of analyzing enormous volumes of data. These technology advancements have helped people with heart, skin, and diabetes conditions. However, cloud computing faces difficulties with security and privacy, confidentiality, and dependability, raising worries among patients and medical staff.

Impact on Healthcare

One of the best options for preventing the spread of COVID-19 is to employ cloud computing services. As a result, there has been an increase in demand for online services. The Daktarbhai telemedicine platform and the introduction of the virtual hospital HelloDoc23 during COVID19 were both backed by telehealth systems. Cloud technology can be used by organizations to integrate COVID-19-related functionality for clinical operations as monitoring, diagnostics, and consultations.The Pathao Health application offers medical services via mobile and video consultations as an online COVID-19 sign checker. Through this service, users may also order prescription drugs and acquire prescriptions.It is also beneficial for the medical workers themselves who will reduce the risk of contracting the disease.

Applications of cloud computing can assist in the construction of operational management dashboards that facilitate workforce, resource, and care planning, real-time monitoring of COVID-19 patients using data overviews from various sources, and remote patient and healthcare staff communication.

Summary

Obviously, the use of cloud computing in healthcare systems is not limited to the examples that were mentioned in this study. The use of cloud computing in any type of e-health services will be effective when we need quality parameters, including on-demand self-service, wide network access, integration of ICT resources, rapid ICT elasticity and measurable services. Different applications are developed depending on the nature of the service, which provides resource sharing at four levels (DaaS, SaaS, PaaS and IaaS). The fact is that the use of cloud computing in healthcare systems not only makes medical services more affordable, but also helps countries achieve health equity.

Responsibilities

- Dayana: Collecting data and modifying it. Writing introduction and literature review.

- Aliaskar: Collecting data required for the body part.

- Rakhat: Summarizing all information and writing conclusion. Creating presentation

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