**Cloud Computing**

**Introduction:**

Cloud Computing defined simply as just pay and use whatever the software services required over the internet. There are many types of software services available in cloud by the respective cloud service provider such as DataBase Services, Storage services, Security services , NetWork services and Analytical services. These services are readily available in cloud which doesnot require any hardware installations and configurations and can be utilized without any delay .

**Evolution of Cloud Computing :**

Any software application requires different types of services such as application server where software is hosted , database service which will be used by application to store the data , Security service which protects the data etc. Traditionally , an organization has to buy a hardware server ( high expensive) for each service to host it and configure everything which needs more infrastructure cost , manual effort and maintenance. To overcome this , all these services are hosted and readily available in cloud from Cloud Providers . The organization just needs to buy and utilize it.

**Cloud Computing in HealthCare :**

Cloud computing is quickly becoming a necessity in the medical field. It just might be the answer to help transform healthcare to share patient information between medical providers on urgent cases in real-time. More than 83% of the healthcare industry today is implementing cloud for their business operations by replacing their old data systems. Cloud runs essential applications to keep the hospital operations running without a glitch, analyses patterns from unstructured data to help doctors better diagnose, and enables patients to remotely view their test reports and prescriptions from the data securely stored in the cloud. Cloud offers operational, functional, and economic benefits for everyone involved – patients, doctors, and healthcare organizations.

Three types of cloud infrastructures can be implemented in HealthCare such as Public Cloud , Private Cloud and Hybrid Cloud.

***Public Cloud :***

Public cloud infrastructure allows public access to generic health information or retrieve medical resources. Hospitals and health clinics could even use a public cloud for remote storage of their own medical data (not the patient’s data).

***Private Cloud :***

Private cloud could be implemented to connect healthcare providers to securely transfer electronic documents and share health information about patients such as EHRs , Pharmacy orders, patient billing and claims etc.

***Hybrid Cloud :***

Hybrid cloud allows to integrate on-premise infrastructure with public and private cloud.

**Diagram

Description automatically generated**

**Concept + Application**

***A Centralized Medical Record Access*** *:*

At hospitals, almost all the patients have separate files or medical records for their various doctors’ visits which is quite difficult for doctors and staff to maintain and manage the paperwork. That is now replaced and made simple via cloud migration. Nowadays, all the files or reports are located at one centralized location accessible via a web portal at healthcare centers.Organizations can use the respective cloud service from Cloud Providers like AWS or Azure to store and retrieve medical record files. This will help doctors diagnose patients quickly based on swift access to medical records saved over cloud. Also, the system can set periodical backup by using managed services.

***Medical Record Security :***

Comparing with physical records, cloud-powered healthcare solutions are much more secured & effective. The data stored over the cloud is accessible only to the authorised healthcare providers as and when required. This helps to avoid any unwanted circumstances which can occur because of an information leak.

Cloud platforms such as AWS, Azure enable their covered entities which subjects to **U.S. Health Insurance Portability and Accountability Act of 1996 (HIPAA)** to use the secure cloud provider environment to process, maintain and store protected health information.

***Patient Engagement :***

**Using the cloud based solution , patients can easily schedule their doctor appointments with just few clicks away. Reminders can be set and sent automatically to both doctor and patients to avoid follow ups using the services like SMS and Emails. Reminders for medicine usage can also be set and timely interaction with doctors for multiple checkups can be done using the cloud services.**

***Scalability :***

**Cloud based services are highly scalable to accommodate new data or storage with no time delay during any difficult circumstances like pandemic situations .**

***Analytics and Diagnosis :***

To perform clinical and medical device data analytics, healthcare organizations leverage machine learning models based on cloud data and other advanced solutions that result in accurate and insightful discovery, visualization, and diagnosis. The volume and variety of structured, unstructured, and streaming data in healthcare and life sciences require highly-scalable platforms for storing and analyzing data and running predictive models that support real-time decision-making.

**Adoption of MobileDevices in HealthCare**

Mobile devices have become commonplace in health care settings, leading to rapid growth in the development of medical software applications (apps) for these platforms.Numerous apps are now available to assist HCPs with many important tasks, such as: information and time management; health record maintenance and access; communications and consulting; reference and information gathering; patient management and monitoring; clinical decision-making; and medical education and training.

One major motivation driving the widespread adoption of mobile devices by HCPs has been the need for better communication and information resources at the point of care.Ideally, HCPs require access to many types of resources in a clinical setting, including:

1. Communication capabilities : voice calling, video conferencing, text, and e-mail .
2. Hospital information systems (HISs) : electronic health records (EHRs), electronic medical records (EMRs), clinical decision support systems (CDSSs), picture archiving and communication systems (PACSs), and laboratory information systems (LISs)
3. Informational resources : textbooks, guidelines, medical literature, drug references
4. Clinical software applications : disease diagnosis aids, medical calculators

**Conclusion :**

Cloud based solutions has numerous advantages to medical professionals and patients with respect to HealthCare which can save time , cost and human efforts . These cloud services reduces much workload for the Health Care IT support professionals because of the various features which are readily available .