

E-Healthcare by using Cloud Computing

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Abstract: Hospitals currently use a manual system for the management and maintenance of critical information. The current system requires numerous paper forms, with data stores spread throughout the hospital management infrastructure. Often information (on forms) is incomplete, or does not follow management standards. Forms are often lost in transit between departments requiring a comprehensive auditing process to ensure that no vital information is lost. Multiple copies of the same information exist in the hospital and may lead to inconsistencies in data in various data stores.

The E-Healthcare by using cloud computing is design for every Hospital to replace their existing manual, paper based work. The new approach is to control the following information: patient information, staff, doctor, reports, etc. These services are to be provide in an efficient, cost effective manner, with the goal of reducing the time and resources currently required for such tasks.

The information will be stored on a cloud which can be access from anywhere using the internet. All the information will be easily available and can be accessible efficiently.

Index Terms: Cloud, Healthcare, Hospital, Patient.

I. INTRODUCTION

Healthcare is a field in which accurate record keeping and communications are of critical importance and yet the use of computing and networking technology in this field lags way behind as compared to the other fields. Healthcare professionals and patients are often uncomfortable with computers, and feel that computers are not central to their healthcare mission, even though they agree that accurate record keeping and communication are essential to good healthcare. In the current scenario of the healthcare industry, information is conveyed from one healthcare professional to another mostly through paper notes or via personal mode of communication. The electronic communication between physicians and pharmacists is not typically employed but rather the physician writes a prescription on paper and gives it to the patient. The patient carries the prescription to the pharmacy, waits in line to give it to a pharmacist, and waits for the pharmacist to fill the prescription. To improve this process the prescriptions could be communicated electronically from the physician to the pharmacist and the human computer interfaces will be provided to the physicians, nurses, pharmacist and other healthcare professionals where they can access such information and act on it.

The process of provisioning healthcare involves massive healthcare data. When a patient is admitted to a hospital, his/her information is entered into electronic health record (EHR) on cloud base systems. Physicians diagnose the patient and the diagnostic information is store on cloud. In the diagnosis process, the doctors retrieve the health information of patients and analyze it to diagnose the illness. Doctors can take expert advice by sharing the information with consulting specialists. This setup provides several benefits to all the stakeholders in the healthcare ecosystem through systems such as health information management system, laboratory information system, radiology information system, pharmacy information system, etc.

With this system hospitals can access patient data stored is on cloud and share the data with other hospitals, So that the admissions, care, and discharge processes can be stream line. Patients can manage their prescriptions and associated information such as dosage, amount, and frequency, and provide this information to their healthcare provider.

II. LITERATURE SURVEY

In a survey found that the most of the hospitals are currently relying on the old paper based system. Which includes two scenarios, first when patient is visiting the doctor for the first time or when it's a revisit. Now whenever a new patient is visiting, he makes an appointment with receptionist, then a new card or file is generated in the name of the patient. Patient takes this file to doctor, doctor checks up the patient, and writes his review in the patient's file. In the same file sometimes space is given for medication section or doctor prescribe the medicine on his writing pad and attach it to the patient's file. Then the patient takes that file to the pharmacist and purchases the medicine and goes back to doctor or receptionist to confirm if he got the prescribed medicine. In the case of old patient, patient needs to carry his/her old file with every visit, which includes all the earlier reviews, reports and prescriptions.

The current system is in working for decades but still has many flaws ranging from difficult to read handwriting to the lost patient files. The numbers of patients are always increasing which is resulting into larger manual database which gets difficult to handle day by day, resulting into human errors. To overcome these issues small changes are being made, like maintaining the records with serial numbers, maintaining files chronologically.

The ultimate solution to all the issues faced by hospitals is electronic record maintenance. So moving ahead with this idea of e-healthcare system for different modules like Doctor, Receptionist, Pharmacist, Patient and account.

III. CLOUD COMPUTING

The Cloud computing is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. so for this it encompasses several variations of service models (i e., IaaS, PaaS, and SaaS) and deployment models (i.e., private, public, hybrid, and community clouds), as defined below.

A. Infrastructure as a Service (IaaS):-

It provides users with processing, storage, networks, and other computing infrastructure resources. The user does not manage or control the infrastructure, but has control over operating systems, applications and programming frameworks.

B. Platform as a Service (PaaS):-

It enables users to deploy applications developed using specified programming languages or frameworks and tools onto the Cloud infrastructure. In this user does not manage or control the underlying infrastructure, but has control over deployed applications.

C. Software as a Service (SaaS):-

It enables users to access applications running on a Cloud infrastructure from various end-user devices (generally through a web browser). The user does not manage or control the underlying Cloud infrastructure or individual application capabilities other than limited user-specific application settings.

IV. CLOUD DEPLOYMENT MODEL

Deployment of a cloud can be done in the following ways as

A. Private clouds

This will operates solely for one organisation. They may be managed by the organisation itself or by a third party, and they may reside on-premises or off it.

B. Public clouds

This cloud is open for general public or a large industry group and are owned and managed by a Cloud service provider.

C. Hybrid clouds

It combines two or more clouds (private or public) that remain unique entities but are bound together by technology that enables data and application portability.

D. Community clouds

Feature infrastructure that is shared by several organizations and supports a specific community. They may be managed by the organizations or a third party and may reside on-premises or off it.

V. CLOUD COMPUTING IN HEALTH CARE

Considering cloud computing for health care organizations, systems must be adaptable to various departmental needs and organizational sizes this approach must encourage a more open sharing of information and data sources. Hence there might be a need to create a 'Healthcare-specific Cloud' that

Specifically addresses the security and availability requirements for healthcare.

This Figure gives you specification about E-Healthcare, having Community cloud as a Data Storage for Hospital as well as Patient.

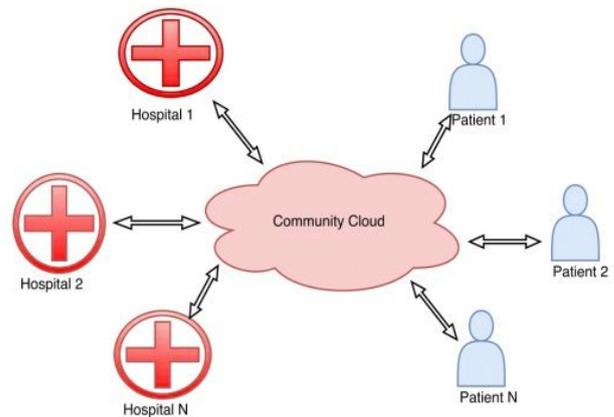


Fig. E-Healthcare

By considering these all facts, The Community clouds computing is use in E-Healthcare. Which includes software as a Service (SaaS) model.

This Community clouds feature infrastructure that is shared by several health care organization to store patients' information in specific community. Like their name, address, contact No., life style, and allergies, current and past treatments, medication and supplements, family history. By using this features patients as well as Doctors can easily assesses to their data by remotely anywhere any time. Hence it will put great advantage to reduce manual working. And maintain patient reports.

VI. CONCLUSION

The cloud base E-Healthcare is great improvement over the manual work using case fields and paper. The computerization has speed up the process. In the current manual work managing is very slow. So that the E-Healthcare base on cloud is thoroughly check and test over dummy data and thus is found to be very reliable.

VII. REFERANCES

- [1] ArshdeepBahga and Vijay K. Madiseti, *Fellow, IEEE*, "A Cloud-based Approach for Interoperable Electronic Health Records (EHRs)", *IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS*, VOL. 17, NO. 5, SEPTEMBER 2013.
- [2] Firat Kart, Louise E. Moser, and P. Michael Melliar-Smith, "E-Healthcare System Using SOA", *Published by IEEE Computer Society 1520-920 /08/\$25.00* © 2008 IEEE.
- [3] Robert S. H. Istepanaian, "Guest Editorial Introduction to the Special Section: 4G Health—the Long-Term Evolution of m-Health", *IEEE TRANSACTIONS ON INFORMATION TECHNOLOGY IN BIOMEDICINE*, VOL. 16, NO. 1, JANUARY 2012.

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