

A Novel Approach for Healthcare Information System using Cloud



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Abstract: The main objective of this paper is to outline a Cloud Computing based Healthcare Information System that helps bridge the gap between various hospitals, patients and clinics by creating a central hub of patient details and health care history that is accessible via two interfaces- either the mobile app or the web application.

Index Terms: Cloud Computing.

I. INTRODUCTION

This paper delivers a framework for a Cloud Computing based Healthcare Information System that permits users to access their health care history on an android platform, along with any other immediate family members' health care history and allows hospitals and clinics to access an inpatient's healthcare history from any other hospital.

II. SYSTEM IMPLEMENTATION

A. Mobile Application: (for the patient)

A new user would register with an email id and phone number to the cloud database and provide personal details like blood group, current height, current weight, current age and other similar information[1].

If the email id and phone number has been verified then the user is provided with a particular id which the user can use along with their password to access their health care history. Now, when a user registered to the Cloud Computing Based Health Care Management System, checks into a hospital or a clinic, they only need to provide their assigned id- for the hospital or clinic to be able to upload the user's diagnosis and treatment plan onto the main database of the Cloud Computing Based Health Care Management System via a web application.

B. Web Application: (for the hospital/ clinic)

A new hospital/clinic would first have to register with a mobile number and email id along with a copy of its credentials. These credentials are pushed into a queue to be verified by the government. Once the hospital/clinic receives its verification, it is assigned a unique id which it may use to log into and update the database with a patient's consent and unique user id. Now, when the hospital receives a new inpatient it only has to get the patient's unique user id and it would be able to access that patient's health care history along with personal details such as blood group etc.

III. EXISTING SYSTEM

The existing system is the conventional healthcare system. In this system, medical doctors and other healthcare professionals (such as nurses, pharmacists, and therapists) treat in-patients using drugs, radiation, or surgery and include the treatment details to only that particular hospital or clinic's database[2]. For this database, generally most hospitals make use of a local server or private cloud to store patient information and this data is localized to one particular hospital or a small group of Hospitals under a parent company. A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrative needs of hospitals. In many implementations, a HIS is a system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services. Yet it holds no suitable way to store overall patient healthcare details into one single database nor does it have any interfaces that allow other hospitals or patients to access whichever healthcare history.

Disadvantages of the conventional system.

The complications associated with the conventional health care system are:

A. The lack of information retrieval: For instance, to find a patient's history, a doctor must go through various records and catalogues from numerous hospitals before the doctor can reach a possible treatment procedure for that patient as the health care history not directly available.

B. The lack of instant information storage: The information generated by a patient's various check-ins into clinics and hospitals (through-out their life) take time and effort to be stored at directly accessible places.

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C. The lack of an easy interface to generate reports: It becomes a difficult task to obtain a patient's healthcare history and treatment, as the patient's history and allopathic data gets stored at different spaces that don't have one distinct interface- the data needed by a doctor or a patient may not be available immediately on demand[3].

D. It's easy to overlook details at data entry: Some patient events are unlikely to appear in databases (depending on how they originate); missing from the databases considered here are services that may have been advised but neither sought nor rendered—screening examinations not given, physician follow-up visits not advised or kept, and prescriptions given but not filled[4].

Other reasons for missing data involve out-of-area care for an individual who is otherwise in the database.

IV. PROPOSED SYSTEM

The proposed scheme is our Cloud Computing based Healthcare Information System, it provides one single interface to access a person's healthcare data via two platforms: 1. one mobile app that is aimed at the patient as a user who would enter personal health care details such as blood group, and other similar data 2. and another as an online platform that is accessible to the hospitals/ clinics which request to view a new in-patient's medical history as well as update the cloud database about the new treatment patterns. Figure 1 shows the architecture of the cloud health care information system.

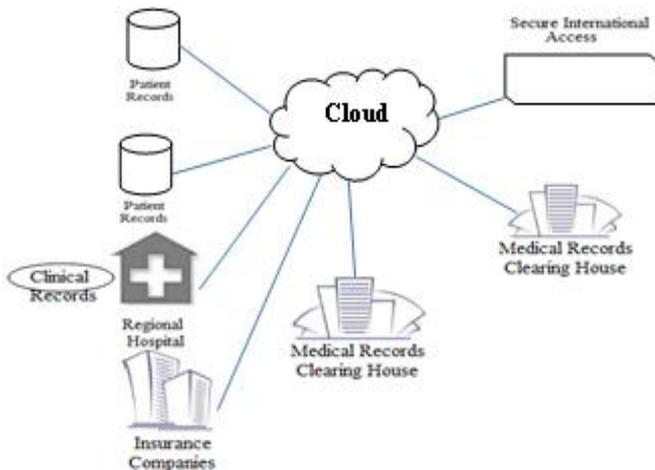


Fig.1 Health Care Cloud Architecture

This makes the idea of a single interface between a patient and the treatment easy to use, flexible and can be designed and developed to deliver conceivable benefits to the Healthcare sector as a whole. Any type of information pertaining to the patient will be available when needed and also to ensure immediate storage of patients' details.

This system not only holds the Allopathic history but also holds the patient's history with Ayurveda Medicines or any other documentable treatment history. It can overcome human errors where a hospital might not test a new patient for medicinal allergies before administering a treatment pattern. It is a complete health care management system. Advantages of the Health Care Management System:

1. It provides storage and retrieval facilities (In context with diseases and medicines).

2. This system promises very less or no paper work.
3. In this system all the information that can be stored about a patient's treatment and history is stored and retrieved electronically that makes it an effective process and provides an easy retrieval of health care history information without having to query through many databases.
4. The two platforms of this system make it very easy for the two types of users that enter the system to interact with each other as the patients as well as doctors are able to receive and provide information to a single cloud based database.

V. WORKING PRINCIPLE

Consider a family of four travelling from Delhi to Chennai, if the youngest son of the family were to get sick on reaching Chennai, the parents would rush him to the nearest hospital where the doctors would ideally perform tests and create a treatment plan and administer it. Then the doctors would include this treatment into the main database [5]. Now, in this hypothetical situation, if the child shows symptoms of being allergic to one of the medicines being used to treat the sickness, then the doctors would inform the parents and prescribe an alternate treatment plan. If the same child gets sick 5 years later, in Delhi, in the same way, then the hospital would not waste time in the default treatment plan for that sickness, and instead choose to go with the alternate plan from the get go. They would know this because once the child is an in-patient to the hospital they would automatically be able to view the patient's medical history and past healthcare. This would save time, money and resources that can be better spent.

VI. FUTURE ENHANCEMENT

In the future, it would be possible for other businesses to access this data with the patient's consent. Companies that deal with health insurance, international Immunity shots' records and other similar sectors can view this large repository of data with the patient's consent, to better plan out future medical needs.

VII. CONCLUSION

Adoption of cloud computing in the healthcare industry will continue to evolve and accelerate in the coming years. Expanding usage of healthcare IoT devices and the need to store and analyze vast amounts of healthcare information to deliver both personal and population health management services necessitates the need for cloud computing from both a business and technology perspective.

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