DESIGNING CLOUD SUPPORTED HEALTH SERVICES MODEL FOR RURAL AREAS IN MAHARASHTRA

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ABSTRACT:

Information technology is used in large scale in healthcare sector for accessing medical services at condensed costs. By using the cloud infrastructure one can outsource computation and storage resources. Use of Cloud services will help in directing the core business activities of health services with less hassle and larger efficiency. Cloud healthcare, interestingly, tries to change the healthcare delivery model from doctor-centric to patient-centric.

Keywords: Information technology, healthcare, cloud, doctor-centric, patient-centric

1 INTRODUCTION:

There are a number of services offered on demand over the internet. Cloud computing is one of the internet-based computing paradigm which is using servers for providing storage, computing power, development stages and software to computers and other devices if required. In the current century, the absence of sufficient hospitals in rural and resource-poor areas, the exponential complexity of lifestyle (predominantly urban) and the increasing of interminable diseases make healthcare a serious issue. Services in Healthcare are in more demand even there is deficiency of healthcare providers like experienced and qualified healthcare professionals such as doctors, nurses and druggists [1].

Public as well as private medical organizations are providing health services in Maharashtra. In comparison with the public sector, the private sector is playing a most important and lead role in the provider of services like outpatient and inpatient. From the study in the year 2004, 79% of Maharashtra's citizens adopt private source for outpatient care, whereas 67% adopt private source for inpatient care [2].

2 LITERATURE REVIEW:

The concept of patient centered health record to be stored in web based system is introduced in 1994 by Szolovits et. al. [3]. Health records can be shared by different stakeholders of healthcare services so providing authentication to health record is must. Public key infrastructure (PKI) is used for maintaining the privacy of the same is presented by the author in 2007 and 2010[4, 5].

A system introduced in year 2010 is to automate the process of accumulating patients' essential data through the network of sensors linked to medical devices. This system was cloud-based which transport the data to medical centers to be stored, processed, and distributed as well [6].

Nowadays there are number of web services and applications related to healthcare are available.

So maintaining the entire digital information of patient is becomes a more complicated task, but hospitals have to maintain each and every record. In the cloud based health monitoring system hospital staff will update patient's information to doctor through mail by some time interval [7].

3 METHODOLOGY:

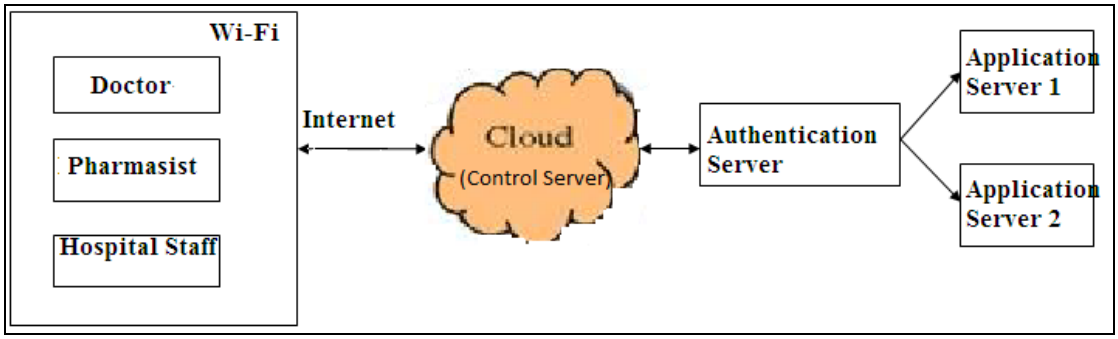

Figure 1: Architecture of Cloud Based Model for Rural Healthcare Center

Figure 1 demonstrates the operations performed by Cloud Based Model for Rural Healthcare Center. The model provides the capabilities to the patient in sending the information to Application server through the Internet that are capable of collecting health information. The model supports 'n' number of application servers to store huge data. Proposed model connects various elements such as Authentication Server and the cloud control server.

The algorithm associated with cloud based model for rural healthcare center is described in Figure 2, as follows:

Step 1: Start
Step 2: Accept the data through Internet Devices
Step 3: Generate EMR from given data for Maharashtra State.
Step 4: Check the database with accepted data. If matched go to Step 5, Otherwise go to Step 7.
Step 5: Analyze the disease and suggest nearest hospital to the patient. Also provide precautions.
Step 6: Store the information to the Azure cloud platform.
Step 7: Send the information to the patient's device.
Step 8: If more assistance is needed, then go to step 9, otherwise go to step 12.
Step 9: Search the available hospitals in Maharashtra for treatment.
Step 10: Search the available Pharmacists from Maharashtra to make the connection with them
Step 11: Stop.

Figure 2 Data Processing Algorithm in Cloud

4 PROTOTYPE IMPLEMENTATION:

4.1 Flow Chart of Proposed Model:

Here show the logical flow that is taking place when the user interacts with the model.

The primarily data set includes data items to take patient information like emergency contact information, patient name , patient's aadhar number, doctor information, insurance data, purpose for visit, patient history like present, past, personal, family, obstetrics and gynecology, surgical, immunization, allergy history, clinical test results, blood group type , diagnosis test undergone, test results, medical summary, treatment plan for medication referral etc. We follow the standard template for the storage of the medical record.

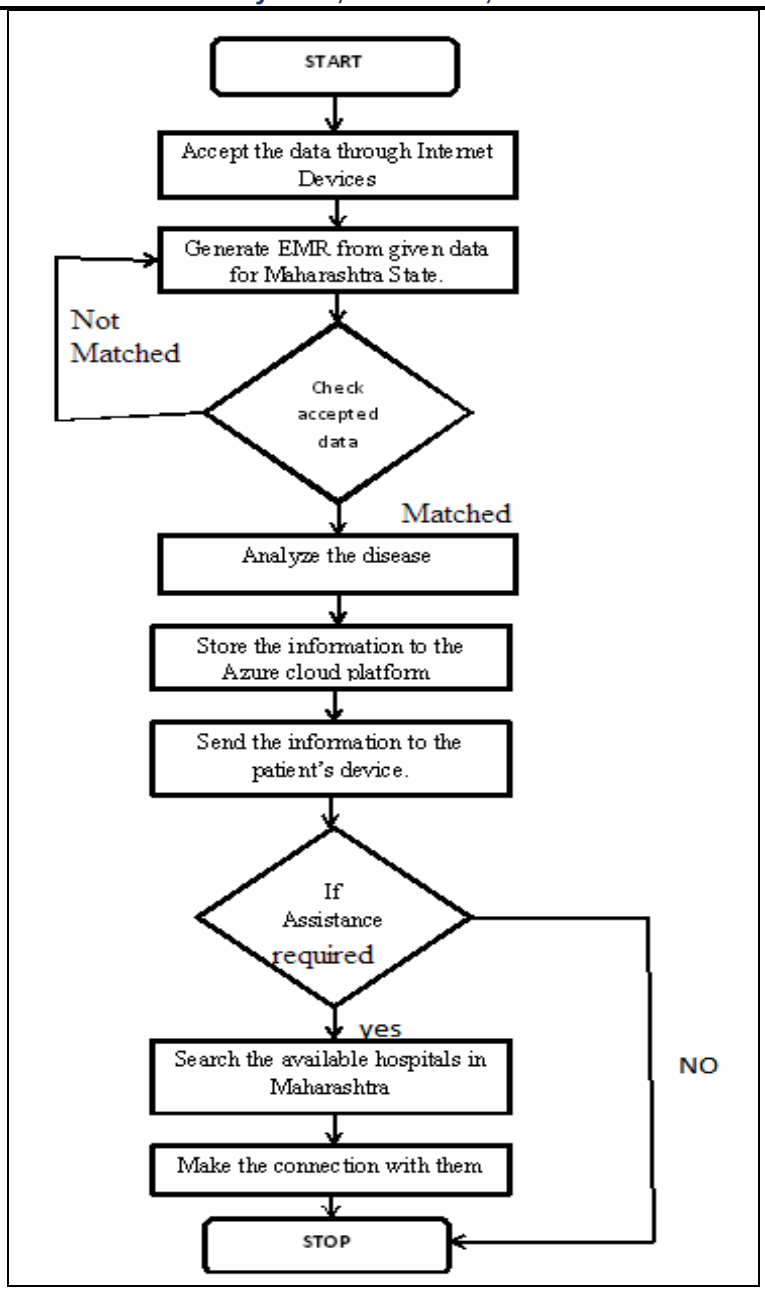

Figure: 3 Flowchart for the Proposed Model

Figure 3 shows the flow chart that is taking place when the user interacts with the model. The logic behind this model is that it starts from top to bottom. The 'Patient' orders the services flowing from creating patient data considering all the steps to the last step of reporting outbreak. The middle column or 'Staff' section specifies the services undertaken by the system administrator. The last section of 'Clinic' specifies the features on how clinics details are processed into the system.

5 ADVANTAGES AND DISADVANTAGE:

1. Making the time and attempts required to roll a healthcare IT application in a health care centers.
2. Patients can see their health data records or documents and prescriptions on their smart phones on a demand basis

3. It can also be used to share information flawlessly and in near-real-time across devices and other organizations.
4. This cloud model, customer only pays for what they use.
5. Significant Cost Reduction: The cost of executing the traditional healthcare system is extremely heavy but in cloud computing available at a portion of the cost of traditional IT Services. Upfront capital expenditures eradicated; noticeably decreased IT administrative load.
6. Increased Flexibility: It is an on demand computing via business solutions, technologies, large environments of providers and minimized novel solution implementation times.
7. Access anywhere: The services can be retrieved from a single computer or network. Use diverse PCs or shift to portable devices and applications and documents follow.

6 CONCLUSIONS:

This paper designed a cloud supported health service model for the rural areas in Maharashtra.
In this proposed model hospital staff is imputing the patient's health data and update it.
Doctors can make use of cloud services to detect the disease as well as advice/ diagnosis patient related to the medicine and treatments. As we are using cloud computing, data is available on cloud. It provides high availability of data, low cost of system maintenance, high performance, etc.

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