

Implementing Health Care Center using Hadoop for Analysis and Prediction of Diseases

Velmurugan A, Albert Mayan J, Mohana Prasad R, Yovan Felix A



Abstract: Healthcare is very important in the medical field. In order to satisfy this area, we have proposed our scheme using the big data platform for data communication as well as data access. We have also used the java program for developing the application-oriented area. In this scheme, a unique concept has been implemented like user can request the information about the health to the officer, then the officer will communicate with Hadoop Distributed File System (HDFS). Then HDFS will get the information from the medical research Centre without any knowledge of intermediate. In this system we also satisfied the patients on getting the information about their health on an easy basis. HDFS will help medical research Centre for organizing the people's information in HL7 format as well and distributed. So that this system is high in use for the medical field in the future, we have also satisfied the accuracy and speed of the communication in this project.

Keywords: Information, HDFS, registration, Medical Centre, Database management.

I. INTRODUCTION

In Healthcare region, there is some disadvantages, namely security, data management and so on. In this, we have chosen the data management using the HDFS for the patient in the future. Diseases are very high nowadays, it is also not predictable, earlier intimation was not proper in this area, more people were getting slow information of intimation. People were using very less number of devices to care for themselves. In those cases the hospital region is using the internet in a various manner like they are providing the best product to the people for earlier intimation of the disease. Some paper surveyed that the people died on bad intimation and tablets. In those cases, our system is using fast communication for the people who need the disease information. Here some are under consideration,

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namely devices are not working properly, low battery, sudden lack and so on, in that situation authors are told to move the network to the next level, in that point of view we have more options to choose, HDFS with HL7 message conversion, is the biggest area for everything, devices can be connected with one admin, so that admin can maintain or see what are all the information he needs through the devices... We have proposed the concept for engaging the technology to a high level for energy consumption. The area which I want to discuss is very important because discussing about the accuracy is very important than all. It will decide the system and bring it to the next level product. So we have achieved the accuracy level very high when compared with the existing one. Surveying the area of device response gave us to understand the communication level, speed, and energy consumption. There is more concept like data integration, preprocessing, administration and maintenance are handled by the healthcare officer. This system will help users for a long period without any problem in the future. We have also surveyed many papers for bringing our product to the next level project.

II. RELATED WORK

Some of the researches were surveyed to maintain the system best for long period. HDFS has application based schemes and object based scheme which helps in performing it to the next level communication accuracy, in that we have surveyed the special is like Distributed system has many areas, in that Hadoop oriented system is giving some accuracy. HDFS application services are implemented for special detection and in the hospital region for data management [1] - [3]. HL7 is the message in conversion, it is used to manage the features and user information in the divided area, it is under control by the admin. The admin can choose the function which it has to do further [4]. A common system is available in the medical region [5], Supporting the device and instruction to the device from the admin is calculated and well balanced by the doctors, like if the patient likes to see the particular area of disease, then the command will be like the part name and the level can be measured in automation [6] - [10]. Android-based communication can be done at the time of system management, here we can also develop the special software and installed in another platform [11].

More area has been implemented through the system scheme and the area difference, in the medical region more devices have accuracy but in the distribution of the system should do their work good for the communication speed and system management.

HDFS is the system which has some more reduction options and may reduce the difference and some will not reduce it completely, there are some concept to show up the Data in speed communication to achieve the proposed system very well and balanced [12].

III. PROPOSED SYSTEM

We have explained our System terms step by step with diagrammatic views and also discussed our application based HDFS for data handling and Integration.

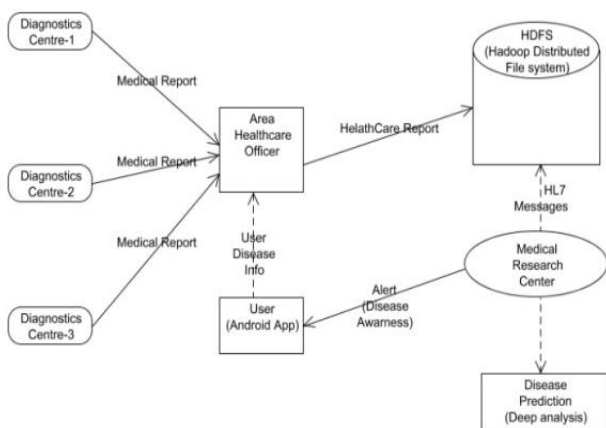


Fig. 1 HDFS based medical data

The user can use this system as like installing the special application from the Android platform, then he can request the information from the healthcare Centre for the data, here data aggregation happens to the Centre. As shown in Fig.1, healthcare Centre is connected with HDFS for the data providing. Once the user is requested the information from the officer, then he will request the information from the HDFS for the report. Finally, HDFS will get the information from the Medical Centre in HL7 format then the information sent to the user as requested.

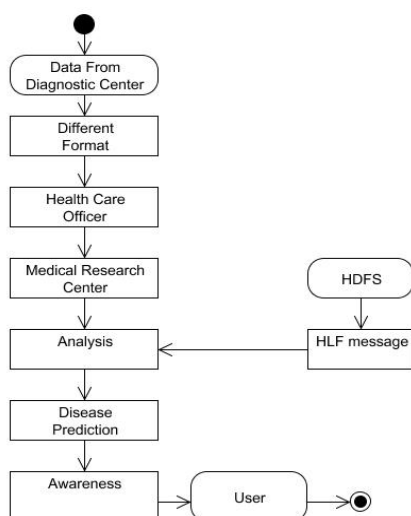


Fig. 2 Flow of Data Search

As we can see it in the Flow diagram, Fig.2, it is listed very clearly about the system. Firstly data from the Centre will be in a different format then it is analyzed by the medical Centre with HL7 formatted data. Finally, data is transferred to the user with HDFS analyzing. In our proposed system, we have many terms to satisfy. We have achieved the communication area in depth by comparing the existing system very well. Some of the terms which we have used as follows.

Diagnostic Center Report Submission

This Centre will report the diseases to the health care officer, then he will send the report for analyzing the report in medical Centre through the HDFS on HL7 message format. While doing this scheme, we can get the information as accurate and the same as we can get the disease information or report as soon as possible. This operation is unique in the medical region by using HDFS. A distributed system is acting as an intermediate for processing the data which was requested by the user. This type of communication is an act at background without any knowledge of the user.

District Healthcare Officer and User

Officer will take care of everything between the user and the system, he will also take care of information which was requested. More system has the officer for managing but here it is different. The officer is only to get the information from the Centre to the user. Once the request was sent to the officer, it is unidirectional to the user, the final report will be sent by the Medical Centre for the accuracy and for the good service.

HL7 Message Preprocessing

It is an electronic data, it has the information about the particular area or particular patient report. This format was used only in the medical-oriented devices and so on. This kind of information format will have clear data about patient disease and the area of the parts. We have made this combination for better results.

Medical Research Center Analysis

Here we are analyzing the information as requested. Then it will go to the user. In HL7 message format, there are more options which are unique for organizing, as requested by the health care officer, the message will be in HL7 format for seeing the disease in the medical type of format. This type of operation is done by HDFS for making this system as faster before. In fig.3, we can see the platform which we have used to build this system and using a virtual machine for comparing the existing system. Results are evaluated well.

IV. EXPERIMENTAL RESULTS

As Fig. 4, we can see the area wise diseases that occurred in various districts, so that we can easily know which diseases are affecting in particular areas and precautions are taken to prevent the diseases.



How ever for most health care providers,the data processing is not the problem,and most health care providers don't have "big data".A hospital CIO I know plans for future storage growth by estimating 100MB of data generated by patient,per year.A large 600-bed hospital can keep a 20-year data history in a couple hundred terabytes.

Using Hadoop, researchers can now use data sets that

were traditionally impossible to handle. A team in Colorado is correlating air quality data with asthma admissions.Life sciences companies use genomic and proteomic data to speed drug development.The Hadoop data processing and storage platform opens up entire new research domains for discovery.Computers are great at finding correlations in data sets with many variables,a task for which humans are ill-suited.

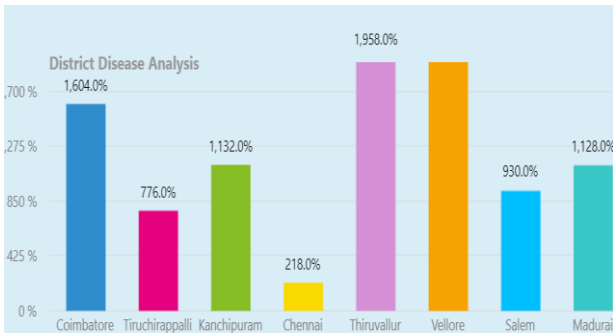


Fig. 3 Area wise Result

Fig. 4 Diagnostic registration form

As we can see it in the above diagram in fig3 the patient can register all his details and upload the data to the health care officer.

Fig. 5 Diagnostic center login form

Each and every patient will be assigned a specific userid and password.Through this patient can obtain all their health

care details.Through this login form the patients can directly notify about their health care issues to the health care officer,through online.Once the notification is send the system automatically forwards the data to near by district health care officer,Once the notification is viewed by district health care officer,he will suggest the precautions to be taken by the patient.

Fig. 6 Diagnostic center patient details

As we can see it in the above every patient can know all their health care details.which is stored in HDFS(Hadoop Distributed File System)where all the information is present in the form of datasets.Once the patient has a bloodtest,they can view all their health care data through online and the hospital keep on updating their health care data each and every time the patient comes to checkup.

DISTRICT	AREA	LABNAME	PHNOCODE	MAIL	MOBILE
Thiruvallur	Aravali	Qien Health Centre	910001	qien.health@gmail.com	9723780410
Thiruvallur	Aravali	Tam Med Health Care	910005	tam.med@gmail.com	9820172865
Thiruvallur	Madhavayal	Star Medical Centre	910018	star.med@gmail.com	9950705917
Thiruvallur	Manali	Medal Precision Diagnostic	910005	medal.or@gmail.com	9226158815
Thiruvallur	Poomalallee	SRL Diagnostic	910018	srl.diag@gmail.com	92261582129
Thiruvallur	Thiruvallur	Saena Viharanda Diagnostic Centre	910100	swamy.vin@gmail.com	9726151963
Thiruvallur	Tiruvethadu	SVRT Diagnostic	910005	svr.diag@gmail.com	9822329905
Thiruvallur	Valasarankam	Shree Lab Service	910011	shree.lab@gmail.com	9195541706

Fig. 7 Health care officer information

In this the health care officer can view all the health care information that has been stored in dataset.Each health care officer will be assigned Login and Password by the health care center.They can access all the health care data.

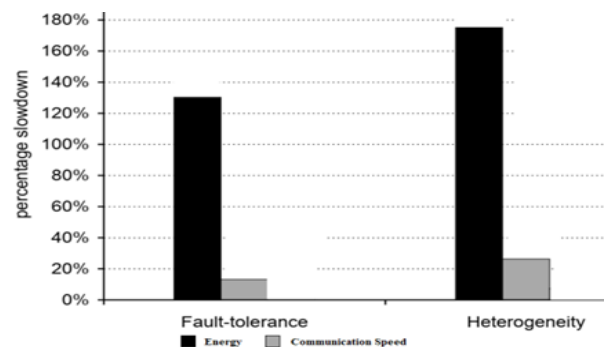


Fig. 8 Existing Comparison

Some scheme has more unique system models but seeing this result, we have proposed the scheme as per this comparison. Fault tolerance is good for the existing scheme, we have compared the result and achieved.

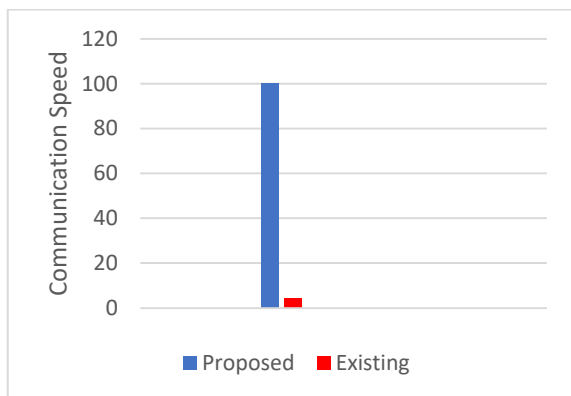


Fig. 9 Communication Analysis

In Fig.5, we have satisfied the communication speed by implementing this system using the HDFS. This scheme is giving information about the disease as accurate and reporting in HL7 is used in the medical region for proper imaging and information. Doing all this we have achieved on result sets clearly

V. CONCLUSION

We have implemented this system by testing the customized profile of the patient with HDFS application, where user can see the profile of the particular disease and getting the report in HL7 format. This system can be implemented throughout the hospital like medicals, operation area and so on. We have tested our system by the graph for seeing the speed of the communication, finally, we have satisfied the area which we have implemented. In the future, this system will have a separate device in addition to reduce human work.

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