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Doctor's Voice Prescription

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Abstract: This paper presents a new healthcare system that would change the way of storing and processing health records. It will digitize the complete healthcare process. There won't be any need to carry paper prescriptions on revisiting doctors. The system will generate an pdf file in tabular format which contain fields like symptoms,disease,advice,name of patient and prescribed medicines in key value format.The System enables the patient to manage the privacy of their personal health record. The system proposed in this paper is targeted to those doctors and clinics that are still using paper-based handwritten prescriptions and cannot afford the existing Electronic Health Record systems available.It is available to doctor in web format.we are using html,css,js for front end and python django rest API for natural language processing.some of python libraries for audio filtering and generation of audio file like pyaudio and pywave .some libraries for desired text conversion like google recognizer or ibm recognizer and some nlp libraries like nltk.corpus and nltk.tokenize for manipulation of text in pdf format.FPDF pdf generator file in python is used for generation of pdf files.

Keywords: FPDF ,NLTK-CORPUS,NLTK-TOKENIZE, PYAUDIO ,PYWAVE.

I. INTRODUCTION

A major issue in India is that generally prescriptions are still written by hand and the readability of such handwritten prescription is very limited. Several cases have come to light, where an error in understanding the prescription by chemist has lead to the wrong medication, which caused severe health issues to the patient[1]. But usage of traditional Electronic Health Record System(EHR) in generating an electronic prescription is tedious and a bit costly for a doctor in India. A proper infrastructure would be needed for setting up such a system. Also, the operating cost and time for the system would also add up. Either the doctor would operate the system on his own consuming time or an operator if employed would cost money.

In this system, Authors are using the doctor's voice as input that would allow reducing the time required to write a prescription. When storing personal health record (PHR), Patient data privacy and security is always a challenge for Authority. The patient will have all the access control over their personal data, what and to whom they want to share medical records Smartphones have fairly penetrated the Indian market, so a smartphone-based electronic prescription system using Speech to Text and patient identification using QR code will be accessible and cost effective for every doctor. In these paper we have introduced a system where doctors is going to read a prescription and a

corresponding pdf will be generated and if doctor wants to edit the pdf again then he will we given an appropriate option to edit the pdf or he can choose an option to record the audio again in well desired format.

II. LITERATURE REVIEW

2.1 An Electronic Prescription System powered by Speech Recognition, Natural Language Processing and Blockchain Technology

This paper presents a new healthcare system that would change the way of storing and processing health records. It will digitize the complete healthcare process. There won't be any need to carry paper prescriptions on revisiting doctors. The system will generate an electronic prescription using speech recognition and natural language processing. A QR code on a patient's smartphone is used to retrieve the digital prescription record stored on a blockchain network. A patient will be able to share historic prescription records to a new doctor. The System enables the patient to manage the privacy of their personal health record. Patient Health Record can only be accessed by using the QR code from the patient's smartphone as an identity. The system proposed in this paper is targeted to those doctors and clinics that are still using paper-based handwritten prescriptions and cannot afford the existing Electronic Health Record systems available. This system can be fully operated even through a single smartphone. It is a combination of a group of 5 modules working together. Those modules include Hyperledger Composer Blockchain Network, Node.js server REST APIs for communicating with the blockchain network, Python Django REST API server for Natural Language Processing or text processing, a React JS based admin panel and a React-Native based mobile application for Doctors and patients.

2.2 A Voice-based Mobile Prescription Application for Healthcare Services

Adverse drug effects are a major cause of death in the world with tens of thousand deaths occurring across the world each year because of medication or prescription errors. Many of such errors involve the administration of the wrong drug or dosage by caregivers to patients due to indecipherable handwritings, drug interactions, confusing drug names etc. The adoption of voice-based mobile applications could eliminate some of these errors because they allow prescription information to be captured and heard through voice response rather than in the physician's handwriting. This paper presents a design and implementation of a Voice-based Mobile Prescription Application (vbmopa) to improve health care services. The application can be accessed through a mobile phone by dialing an appropriate number. This system could lead to costs and life savings in healthcare centres across the world especially in developing countries where treatment processes are usually cumbersome and paper based.

2.3 A Voice-based Mobile Prescription Application for Healthcare Services (VBMOPA

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III.   PROPOSED PROJECT SYSTEM

Python Django REST API Server

The authors are proposing an approach to using Speech Recognition to speed up the process of prescription generation. Speaking a sentence will consume less amount of time than writing it. And Natural Language Processing(NLP) to extract prescription information from the transcript. For speech to text, Google's speech recognition API is the best available API as it supports Indian English, also it is available in Android smartphones as an in-built free to use service.

 describes the text processing done on the python Django REST server. The HTTP POST request from the mobile app is received and the transcript array is decoded from it. The first transcript string from the array is considered for further processing. The Text extraction process involves the removal of unimportant words or stopwords in NLP terms from the transcript string like: is, are, and, etc. Then the keyword-based text extraction is done. There are 4 basic components of any prescription i.e. Patient Name, Patient Age, Symptoms, and Medicines with dosage.

This is regarding how the backend is managed.now when we see things externally it is in terms of website which involves designing its frontend with the help of html,css and javascript.after these things involves managing of generated audio and in desired format (.wav) .these generation and conversion is followed by bit of nlp process as well as some pdf merging some of libraries which are used for these purpose python django ,wave ,pyaudio .for nlp purposes nltk.tokenize and nltk.corpus as well as for pdf generation .

The system consists of a separate module each is assigned one specific job.

1]It all starts with recording of audio in which we have implemented this recording of audio with the help of pyaudio and pywave library in python.Now in order to set the clarity level of our recorded voice to a higher extent we have set several voice deflection factors to some extent which includes parameters like chunk,rate,recording size.

2]The next step involves conversion of .wav file which is created in desired text format.now for these purposes there are various recognizers available in market few of them are recognizer.google,recognizer.ibm and recognizer.microsoft.in these project we have implemented recognizer.google as our text conversion tool and to create the resultant text file.

3]The third phase starts with dividing the file into different parts based on several delimiters for following operations.we have to consider several keywords in the resultant file which includes name,symptoms,disease,advice as well as prescription.based upon these delimiters we are going to divide our files into different sets for further operations.

4]Now here in these after the division phase the next step is to remove the redundant words to bring the pdf in desired tabular format.for these purpose we are using two nltk libraries one is nltk.corpus and another one is nltk.tokenize .nltk.tokenize breaks the input string into tokens and then nltk.corpus have a set of words called stopwords which we want to remove from our sentences .

5]After removing stopwords another thing is to merge the files and bring them in desired tabular format i.e in desired pdf for these we are using the fpdf library for pdf generation.

6]The main parameter which are used in as rate and chunk ,when they get varies accordingly they may affect on the voice collection.
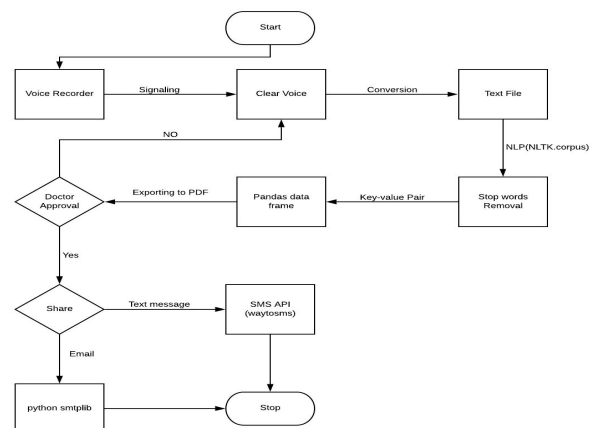

Figure:Block Diagram

IV IMPLEMENTATION

V RESULT ANALYSIS

The proposed and implemented syst[...] over any similar application.

1.Cost   2.Time

the proposed system only open source technology is utilized and the interface is available as a web application and mobile application both. So, the complete system's effective price is less and the usability is more. There is no requirement of proper infrastructure, a single smartphone is sufficient for operating the whole system. It is targeted at those small clinics and doctors that are still using handwritten prescriptions.

An Experiment to decide on the time consumption factor is described below:

4 different prescription transcripts with different lengths listed below are used to depict that with the increase in content the time required in manual input rises more rapidly than the voice input method of this system.

1. Symptom is headache and medicine name is Crocin dose once after meal whenever you feel pain.

2. Symptoms are runny nose and fever medicine name is Cheston cold dose is twice daily after meal for 3 days and name aciloc 150 dose twice daily after meal for 3 days.

3. Symptoms are fever body pain and chills medicine name is d'cold total dose twice daily after meal for 3 days and name aciloc 150 dose twice daily after meal for 3 days lab test test for malaria.

4. Symptoms are headache, muscle pain, joint pain, high fever, rashes medicine name combiflam dose twice daily after meal for 5 days name Aciloc 150 dose twice daily after meal for 5 days lab test test for dengue notes fever was above 104 Fahrenheit even go gor the test of malaria.

For the Experiment, the concluding part the time taken is an average of multiple attempts. And when it comes to compare it with manual and proposed solution, it clearly shows that the proposed system can cut down the time consumption significantly for bigger prescriptions. A difference of around 20-30 secs is visible from manual input and 10-20 secs from the doctor Voice prescription input method in an Android smartphone.

V ADVANTAGES

1]Generated data is present in pdf format so one can understand medicines clearly and accordingly buy it without any misunderstanding

2] It is provided with some encryption key both on doctor as well as the patient's side so that misuse of pdf will not be there.hence pdf will be with secure hands.

3] Pdf which is generated is available in more than one language so that the forwarded data to patients is by considering his vocabulary.

4]Interface is a website so easy to use without any difficulty for doctor as well as provided with some easy instructions for guidance like even if the pdf is not generated according to doctor's need then he has options either to edit it by hand or record another audio.

5]the application improves efficiencies of health care services by eliminating time-consuming call-backs that may be associated with treatment processes.

6]The patient is given the control to share their health records with other doctors.

7]less time is needed to prepare the pdf as well as after generation you can directly forward it to the user as well as the medikit.

`VI CONCLUSION AND FUTURE SCOPE

The proposed and implemented system aims to reduce the amount of time consumed in creating and accessing patient records.Thus, making this system available to all the doctors of India through their smartphone.This is a step toward enhancing the efforts being made to avoid problems of prescriptions by care providers. The access to the patient's medical records real-time improves patients' care by ensuring that correct information such as the appropriate medication to be administered is retrievable. In addition, the application improves efficiencies of health care services by eliminating time-consuming call-backs that may be associated with treatment processes.

The implemented system will reduce the patient record access time and maintain high security and privacy of patient data. The patient is given the control to share their health records with other doctors.

The available pdf is in multiple formats i.e with user friendly languages so that there is no misunderstanding with the medicines prescribed by the doctor.

In future it is available in app as well as web format also there is going to be an option where users can share their prescribed data with other doctors.

In the near future, Authors are planning to integrate and use the system in the real hospital ecosystem to test and validate the implementation and to analyze the impact it will create in the healthcare domain.

REFERENCES

1.Authors Department of Computer and Information Sciences Ikhu-Omoregbe N. A. and Azeta A. A. "A Voice-based Mobile Prescription Application for Healthcare Services "

2.Palo Wireless, VoiceXML resource center, 2007: available online at http://www.palowireless.com/voice xml/tutorials.asp, accessed 19th March 2009 .

3.Azeta A. A., Ayo C. K., Atayero A. A. and Ikhu-Omoregbe N. A. (2009), A Case- Based Reasoning Approach for Speech- Enabled e-Learning System", 2nd IEEE International Conference on Adaptive Science & Technology (ICAST), Accra Ghana.

4.D. K. Sokol and S. Hettige, ―Poor handwriting remains a significant problem in medicine, ‖ J. R. Soc. Med., vol. 99, no. 12, pp. 645–646, Dec. 2006.

5.―Prescription Pad | Prescription Writing Medical Software for Doctors. ‖ [Online]. Available: http://www.prescriptionpad.in/index.aspx.

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