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Text Formatting Based on Keyword Detection

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Abstract— Adverse drug effects are a major cause of death across the world each year because of prescription errors. Many of such errors involve the administration of the wrong drug or dosage by care givers to patients due to indecipherable handwritings, drug interactions, confusing drug names etc. The adoption of voice-based prescription project 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. Our project will generate an electronic prescription using a "Speech to Text converter" (Perceptual Linear Prediction (PLP)) and capture the data from the keywords spoken by doctor(s). There won't be any need to carry paper prescriptions on revisiting doctors. A patient will be able to share his historic medical records to a new doctor. This project also provide facility to sign the prescription and send to the patient directly on his phone and email id. The System enables the patient to manage the privacy of their personal health record. This project is proposed to target those doctors and clinics that are still using paper-based handwritten prescriptions.

INTRODUCTION

This prototype is a user friendly mobile application which can be installed in any smart phones.

The application will generate an electronic prescription using speech recognition and allows doctor to add his signature on the prescription digitally for assurance. This application helps doctors to view and manage their daily appointments, their patient details and much more. Doctors get updated information regarding inpatients, out-patients details and emergency cases. In case of leaves and emergency, doctors can reschedule the appointments with the availability of other doctors or can cancel the appointments easily. Doctors also connected with in and out patients with live chat facility to provide their valuable suggestions in emergency needs. They also get notified through online about the number of appointments in every session. They also can view their feedbacks provided

by patients to improve their services and Electronic Health Records of Patients. This application also helps the patients to book their appointments depends on the availability of required doctors. Also cancel or reschedule their appointments as per patient's requirement. Patient get notified with appointment details before they visit the doctor. Also get notified about the intake medicine and revisit details. In case of the unavailability of a required doctor, patients are rescheduled with other doctors with their permission, instead of cancelling the appointment . This EHR system enables the patient to manage the privacy of their personal health records. Live chat facility to the patients allows them to get suggestions from doctors. This application can also be used by Hospital authorities. Hospital authorities use this app to track their doctors' appointment, billing procedures, in-patient admit and discharge procedures.

Literature Survey :

The solution for the above problem is given based upon the real-time scenarios. They are:

A.Scenario-1:

To write formatted prescriptions based on dictation from doctor.

Solution: In this scenario to write the formatted prescriptions based on dictation from doctor, our application uses “Google Cloud Speech-to-Text” API tool so that the doctor can dictate the prescription and unformatted text is generated.

B.Scenario-2:

The app ought to give facility for doctor to sign the prescription.

Solution: during this state of affairs our app suggests the doctors to feature their signature whereas registration and conjointly later if not needed right away. Doctor will add his signature at the top of prescription, digitally in 2 ways in which – either by drawing his/her signature on mobile or uploading the signature.

o Digital Signature on Mobile: A digitized signature is that the capture of a picture of a wet signature, that is reproduced by electronically to form a computer-generated signature. A digitized signature resembles a wet signature, however instead of being written in ink on paper, it's computergenerated. A “wet signature” is an inspired physical signature written in ink on a bit of paper.

C.Scenario-3:

Send the prescription to the patient directly on his phone and email id.

Solution: during this state of affairs our application can give a send button at the top of prescription wherever the doctor will send it to the patient via SMS and email id on one click. o Details of email and telephone number of patient area unit taken at the time of registration.

D.Scenario-4:

The method of storing the medical records (EHR) ought to follow relevant compliance laws like HIPAA.

Solution: during this state of affairs our application can store medical records of

patients. As doctors began to use EHRs and originated ways in which to firmly share your health data with alternative suppliers.

o cut back Wrong Medication: data regarding your medications are going to be obtainable in EHRs so health care suppliers don't offer you another drugs that may be harmful to you. o Backup of Health Information: EHR systems area unit saved like most pc systems, therefore if you're in a district littered with a disaster, sort of a cyclone, your health data will be retrieved. o Ease at Emergency situations: EHRs will be obtainable in associate degree emergency. If {you area unit|you're} in associate degree accident and are unable to elucidate your health history, a hospital that incorporates a system could also be able to refer to your doctor's system. The hospital can get data regarding your medications, health problems, and tests, therefore selections regarding your emergency care area unit quicker and additional privy.

Existing System :

In existing system folks reach hospitals manually in search of medical facilities, hospitals associated with their malady , government schemes applicable in this hospitals in their emergency cases. It takes several time and energy of the persons even if they failed to get the clear data regarding their would like. This leads in several things they delayed of obtaining treatment that causes important health problems. because of the unconsciousness of the govt schemes obtainable for US folks don't seem to be properly utilize medical services provided by the govt.

Planned System:

In planned system we tend to use Google Cloud Speech-to-Text API a key tool that plays important role because the resolution suggests Speech to Text conversion feature in app. This feature converts the voice of medical practitioners as he dictates the prescription associate degree converts to text that is an unsorted format prescription. so as

to realize it in an exceedingly format that is intelligible that's in an exceedingly format of composing every class like name, symptoms, diagnosis, prescription and recommendation, "keyword detection" idea is employed that arranges the text generated in an exceedingly format . during this prescription, there's provision of assignment digital signature by the involved Doctor or practitioner to create the prescription valid and conjointly he/she will edit prescription whereas dictating. because it is organized, a button is embedded, that performs action of causation prescription within the variety of SMS and email to the patient directly. (Details of email and telephone number area unit taken at the time of registration.) Doctor may work on offline. once the mobile is connected to net, the information are going to be synced. Another feature is "language translation", so it'll be possible to use the app.

Architecture

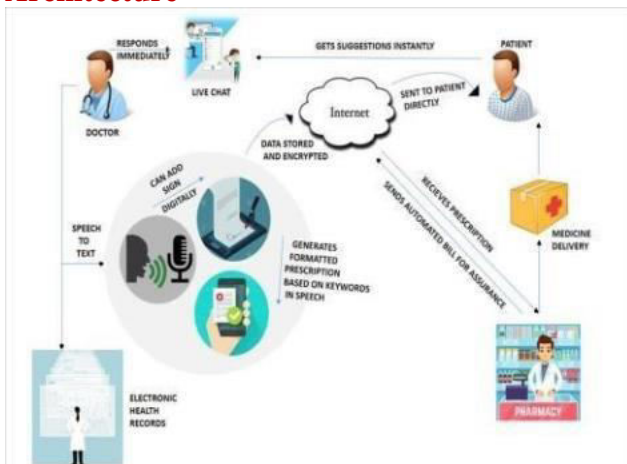


Fig 1: System Architecture

This design describes the work flow of this mobile based mostly system. During this system a doctor will generate a prescription on-line through dictation. A doctor will attach his/her signature at the top of prescription so the patient gets assurance. A doctor will read his patient records that helps in additional medical suggestions and leads to eradicating wrong medications.

4.2 Modules Description

4.2.1 User

- Home
- Generate Prescription
- In-patient details.
- Out-patient details
- Emergency cases
- Patient Records
- Connect with Patient
- Notifications

Fig 2 (Doctor Home Page)

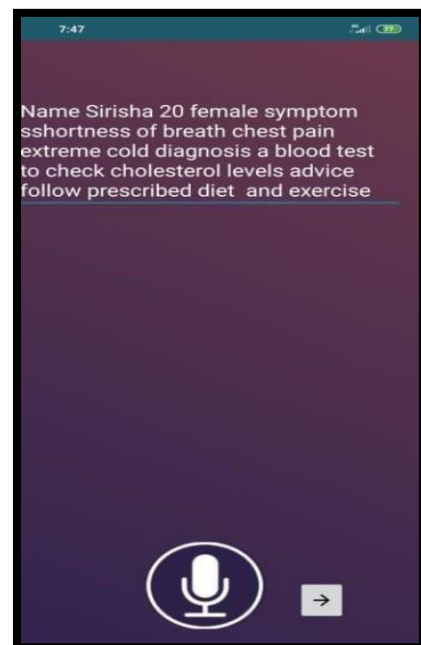
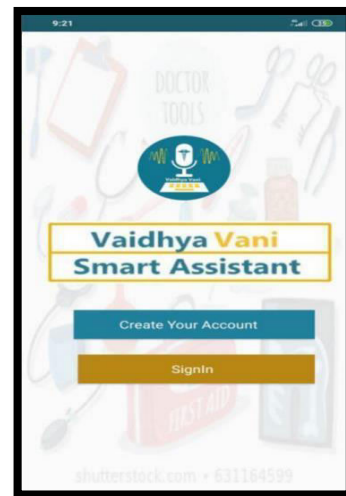


Fig 3 (Prescription Dictation)

Fig 4 (Navigation Bar)

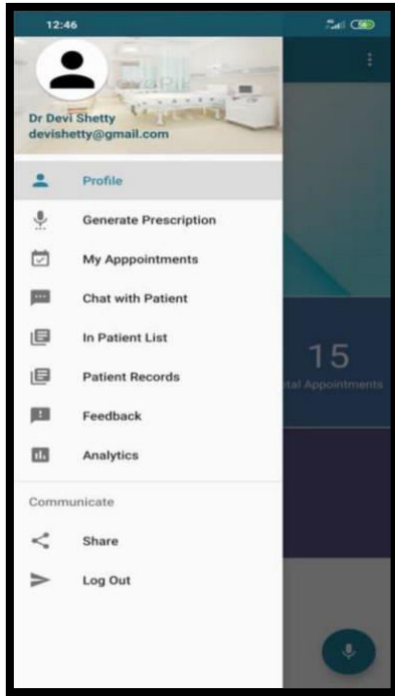
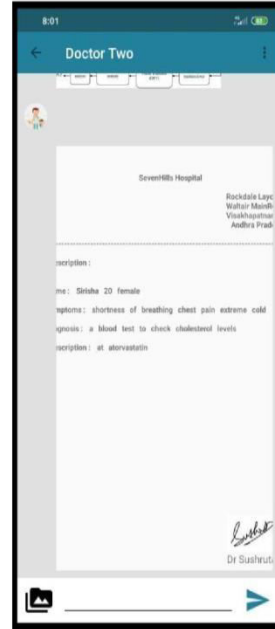


Fig 5 (Generated Prescription)



• RESULT: Fig 6 (Prescription Generation)

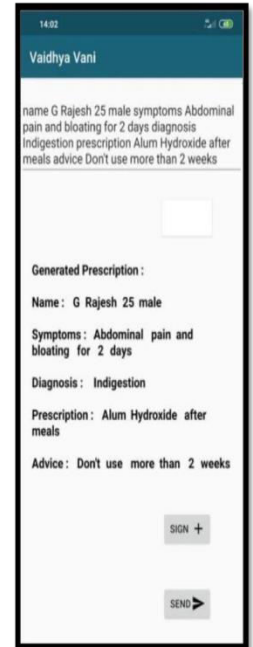


Fig 7 (Patient Info)

METHODOLOGY:

Google Speech-to-Text allows developers to convert audio to text by applying powerful neural network models in Associate in Nursing easy-to-use API.

* The API acknowledges quite one hundred twenty languages and variants to support your world user base. you'll alter voice command-and-control, transcribe audio from decision centres, and more.

* This paper describes a speech recognition system that uses each acoustic and visual speech info to enhance recognition performance in blatant environments.

* The system consists of 3 components: a visible module; Associate in Nursing acoustic module; and a device fusion module. The visual module locates and tracks the lip movements of a given speaker and extracts relevant speech options.

* This task is performed with Associate in

Nursing appearance-based lip model that's learned from example pictures.

* Visual speech options are drawn by contour info of the lips and grey-level info of the mouth space. The acoustic module extracts noiserobust options from the audio signal. Finally the device fusion module is answerable for the joint temporal modeling of the acoustic and visual feature streams and is accomplished mistreatment multistream hidden Markov models (HMMs).

* The multistream technique permits the definition of various temporal topologies and levels of stream integration and therefore allows the modeling of temporal dependencies a lot of accurately than ancient approaches.

SHA-512 Algorithm:

Step 2 : Noise Cancellation:

* we have a tendency to gift 2 totally different strategies to find out the desynchronisation between the 2 modalities and the way to include them within the multi stream models. The superior performance for the projected system is incontestible on an oversized



multi speaker info of incessantly spoken digits.

* On a recognition task at fifteen decibel

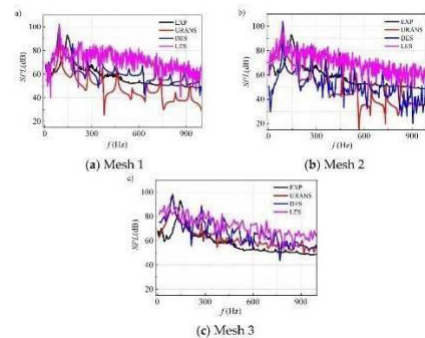
acoustic ratio (SNR), acoustic sensory activity linear prediction (PLP) options result in fifty six error rate, noise strong RASTA-PLP (relative spectra) acoustic options to seven.2% error rate and combined noise strong acoustic options and visual options to two.5% error rate.

➤ **PLP ALGORITHM(PERCEPTUAL LINEAR PREDICTION):**

* PLP algorithmic program could be a Feature Extraction algorithmic program.

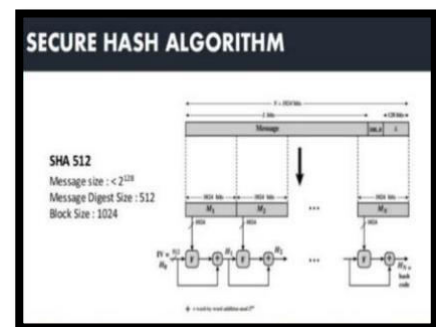
➤ **STEP 1:**

* It receives input as Acoustic Signals (Human/Animal Voice notes).



[SHA-512 Algorithm is an Encryption Algorithm.]

- Based on frequency levels of sounds generated they are distinguished as human voice and noises.
- The input message is taken and breaks it into 1024 bits.



(Bark Frequency $\text{bark}(f) = (26.81f/1960 + f) - 0.53$)

➤ **STEP 3:**

Output: Fine Voice data is forwarded as the output

➤ VITERBI ALGORITHM:

*Viterbi Algorithm is mainly a **Search algorithm**.

*These bits of data are then encrypted using hashing into 64 bytes (512 bits).

<https://www.instagram.com/p/CCY26v1pGIW/?igshid=10ajxlyzmivj3>

Every keyword (phoneme) is allowed to start and to finish anywhere within the spoken sentence at any position

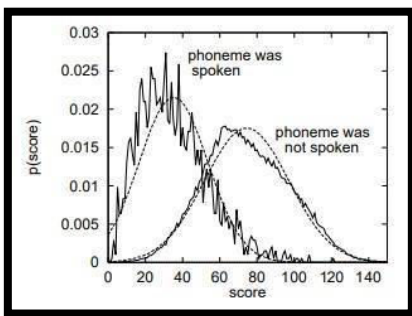


Table 3. Hexadecimal Notation SHA 512

Buffer	Initial Value
A	6a09e667f3bcc908
B	bb67ae8584caa73b
C	3c6ef372fe94f82b
D	a54ff53a5f1d36f1
E	510e527fade682d1
F	9b05688c2b3e6c1f
G	1f83d9abfb41bd6b
H	5be0cd19137e2179

• As patient health data need to be stored with most security, we use this algorithm to store patient personal .

➤ STEP 2:

• This search algorithm matches the health details. word uttered and the keyword as shown in the graph.

➤ STEP 3:

As the keyword is detected,an action to be performed as mentioned.

CONCLUSION

The voice-based mobile Prescription application during this app, permits physicians with mobile phones devices at intervals a network coverage capture and look at patients' medication details. this

can be a step toward enhancing the efforts being created to avoid issues of prescriptions by care suppliers. The access to the patient's medical records time period improves patients' care by guaranteeing that correct info like the suitable medication to be administered is recoverable. additionally, the applying improves efficiencies of health care services by eliminating long call-backs which will be related to treatment processes.

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