

Voice Based Application for Visually Impaired

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ABSTRACT: People who are visually impaired would like to share data, information, records. One way to accomplish this is by using voice recognition software to train the device to recognize text and commands which are being issued. A mobile application is used to get user credentials and a backend database stores and verifies this data. The translation is accomplished using Google API's which are based on AI and ML. This project has the following phases, the first phase is to develop an easy user interface which enables the authentication of the supplicant through voice-based commands. The next phase consists of creating a database which stores all the credentials of the user and his/her related information. The final phase consists of the user being able to perform various activities such as composing e-mails, setting reminders, battery percentage and password protection.

KEYWORDS: AES(Advanced Encryption Standard), DES(Data Encryption Standard), Google API's.

I. INTRODUCTION

There have been many efforts but even now, it isn't easy for visually challenged people to work easily in computer or smart phones. This has led to the concept of voice recognition techniques. This concept of creating a specialized voice application helps visually impaired people to work better with mobile devices and computers. Most of us need to make a call or send a message at any instant from any location. This simple task of sending mails often become a stressful task for the visually impaired. Hence to overcome this basic problem, the proposed android application has been developed voice mail system with secure password manager. This system proposes a voicemail architecture which can be used by a visually impaired person in order to send mails in an easy and in a more efficient manner. The proposed application has online password manager with voice mail system. In this application all the user passwords are encrypted and stored in web server. User can retrieve the password through voice command in mobile application. The main focus of the system is to develop a mobile based voice e-mail system with Secure Password Manager for visually impaired people.

II. LITERATURE SURVEY

Jin-Hee Lee et al. [1] has proposed a system where in a visually impaired person can be guided to reach home in a safe and secure manner. For implementing this idea Zigbee modules were used to understand the signals intensities. Ultrasonic sensors were used to gauge the distance from various objects in the path of the traveller. Varit Prudtipongpunetal. [2] has proposed a system for the visually impaired to navigate in an indoor space. This is achieved by uploading a floor plan on Google maps which enabled a safe and secure navigation.

Zewen Lee et al. [3] has proposed a system to capture the insight scene details using the camera of a mobile device. They have implemented a stabilization technique based on the motion and this helps overcome the jitter issues. R.Kasthuri et al. [4] has proposed a voice based application used by the visually impaired to set reminders and listen to music in an easy manner. They have implemented the above using Selendroid which helps in the communication between the mobile devices and the servers.

Carmel Mary Belinda M.J. et al [5] has proposed a system to enable the visually impaired to exchange messages without the need of typing it. Voice Activation Detection API is used to convert speech to text. Answer Activation Detection API is used to give the response back to the user. Jayachandran.Ketal [6] has proposed a system to enable the blind to communicate easily by creating an instant messenger which will enable communication with any other user connected over the network.

Jing-zhongwangetal[7] proposed a system to enable imagine projection method to calculate image boundary and also uses speech to prompt the directions. PiotrKardyś etal [8] proposed a system wherein the speech is passed through the GSM network. The program developed also checks if the received words are making up any one of the available commands.

III. PROPOSED SYSTEM

A. AES Algorithm

There are broadly two types of encryption techniques, they are Symmetric and Asymmetric encryptions. In Symmetric Encryption a single key is required in order to encrypt and decrypt data i.e. both the users must have knowledge about the specific key in order to access data. Examples of this type include Blowfish, AES, AES-128, AES-192, AES-256 etc. Asymmetrical encryption which is a relatively new method, compared to symmetric encryption.

Asymmetric encryption uses two keys to encrypt a plain text. Secret keys are exchanged over the Internet. Anyone who has access to the secret key can decipher the message and hence asymmetric encryption makes use of related keys for more security.

A public key is available to allow the user a message. The second private key is hidden so that only the user will know and decrypt the message. Some examples of this type of an algorithm includes , RSA, DSA, Elliptic curve techniques etc.

In this system a Symmetric encryption algorithm known as the AES Algorithm is made use of. It is very popular and widely used these days. It is found at least six time faster than triple DES.AES is being used here as it provides full specification and design details.

Implementation of AES algorithm can be done easily using C or JAVA. It supports 3 key lengths of 128 bits,192 bits and 256 bits. It performs all of its transformations in the form of bits and not bytes.

AES is impossible to hack without having adequate knowledge about the input key. The flexibility with key length is another advantage of the AES algorithm. It is a strong cipher and provides high security. The only disadvantage of this type of encryption algorithm would be the simplicity of the key which is used which might lead to an attack sometime.

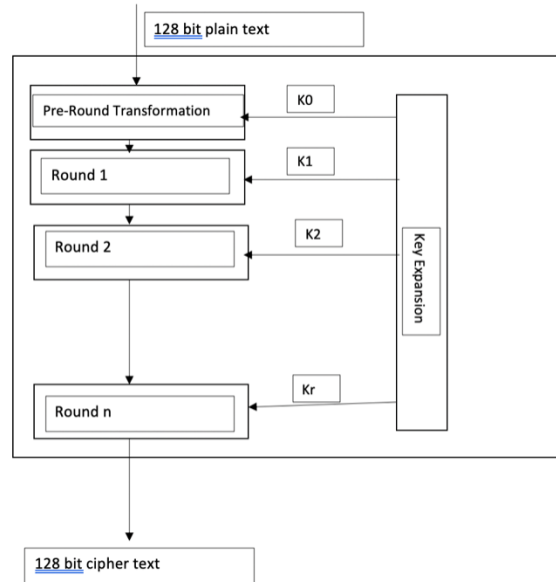


Fig1- AES Algorithm

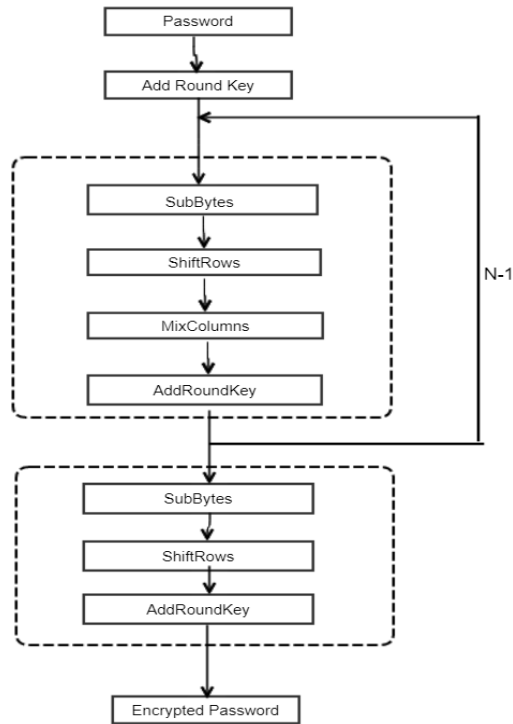


Fig.2 Encryption

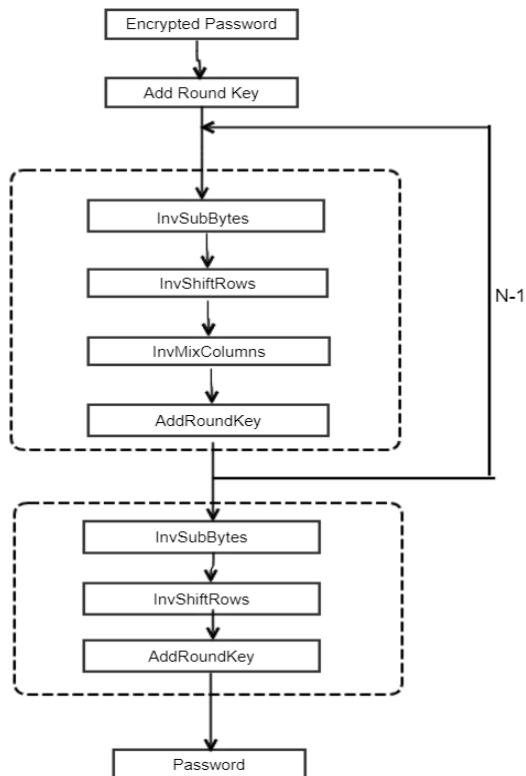


Fig.3- Decryption

B. Google Speech to Text API's

These google API's are a product of google and is based on AI and ML. This is a cloud based speech to text converter and converts audio to text with the help of applying strong and powerful neural network models integrated within an easy to use API.

This API can recognize up to 120 different kinds of languages in order to support users globally. It can process audio in real time and recorded audio by using Google's machine learning technology.

These API's enable users to speak commands and has the capability of returning appropriate data. Cloud speech to text can analyse both long form and short form of data and can convert audio into text immediately.

It can also accurately transcribe proper nouns and can appropriately format language. It is a very robust API as it can handle audio from noisy environments easily. It automatically and appropriately uses punctuations in sentences. This API has 3 types of requests based on audio content, they are Synchronous, Asynchronous and Streaming Requests. In synchronous requests the audio should be 1 minute long and the user need not upload the data to the cloud.

In asynchronous requests the audio should be 480 minutes long and the user needs to upload the data to the cloud. It is suitable for streaming data where the user is talking to microphone directly and needs to get it transcribed. In this project the API's are implemented and the user will speak the login commands or credentials which will be converted to text and emails can be sent to the users recipients.

The visually impaired people face challenges daily in communicating with the ever growing and fast changing world. These people are largely dependent on their sighted colleagues for various needs either to make a phone call or to perform other tasks. This system is based on speech to text conversion application for mobile devices which allows an easy way to send an E-mail. Also this system comes with Secure Password Management system which store the password in web server in encrypted form and when the user need the password, user can retrieve the password through voice command. This system comes with low battery alert and Remainder management.

Advantages in Proposed System are

- Intelligence in achieving hands free speech
- More security for passwords
- Encryption is used to secure user credentials.
- The users enjoy a hassle free usage of the application.

This system is an online application which allows users to access their respective accounts and performs the task of sending e-mails and securing passwords. On the login page the users are prompted to speak their details in order to login to their respective accounts. If the details are valid the users are authorized to access their mails and Passwords. Once logged in tasks such as setting reminders and battery percentage will be prompted to the user.

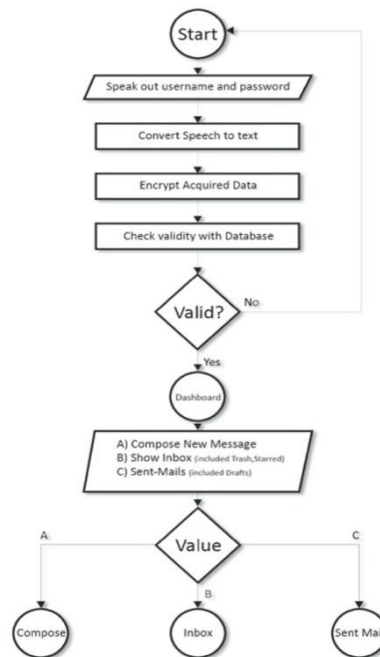


Fig 4. Flow chart for E-mail functionalities

IV. IMPLEMENTATION

Code for AES Algorithm implementation

```

packagecom.util;
importjavax.crypto.Cipher;
importjavax.crypto.spec.SecretKeySpec;

importjava.security.*;
    importsun.misc.*;

    public class AES_CBC_encryption_Decryption {

        private static final String ALGO1 = "AES";
        private static final byte[] keyValue1 =
            new byte[] { 'T', 'h', 'e', 'B', 'e', 's', 't',
                'S', 'e', 'c', 'r', 'e', 't', 'K', 'e', 'y' };

        public static String encrypt(String Data1) throws Exception {
            Key k = generateKey();
            Cipher c1 = Cipher.getInstance(ALGO1);
            C1.init(Cipher.ENCRYPT_MODE, k);
            byte[] encValue = c1.doFinal(Data1.getBytes());
            String encryptedValue1 = new BASE64Encoder().encode(encVal1);
            return encryptedValue1;
        }

        public static String decrypt(String encryptedData1) throws Exception {
            Key k2 = generateKey();
            Cipher c2 = Cipher.getInstance(ALGO1);
            C2.init(Cipher.DECRYPT_MODE, k2);
            byte[] decodedValue = new BASE64Decoder().decodeBuffer(encryptedData1);
            byte[] decValue1 = c2.doFinal(decodedValue1);
            String decryptedValue1 = new String(decValue1);
            return decryptedValue1;
        }

        public static Key generateKey() throws Exception {
            Key key1 = new SecretKeySpec(keyValue, ALGO);
            return key1;
        }

        public static void main(String[] args) throws Exception {
            AES_CBC_encryption_Decryption a=new AES_CBC_encryption_Decryption();
            String txt="test";
            String b=a.encrypt(txt);
            System.out.println("enc :"+b);
            String b1=a.decrypt(b);
            System.out.println("decrypt is :"+b1);}
    }

```

A. RESULTS

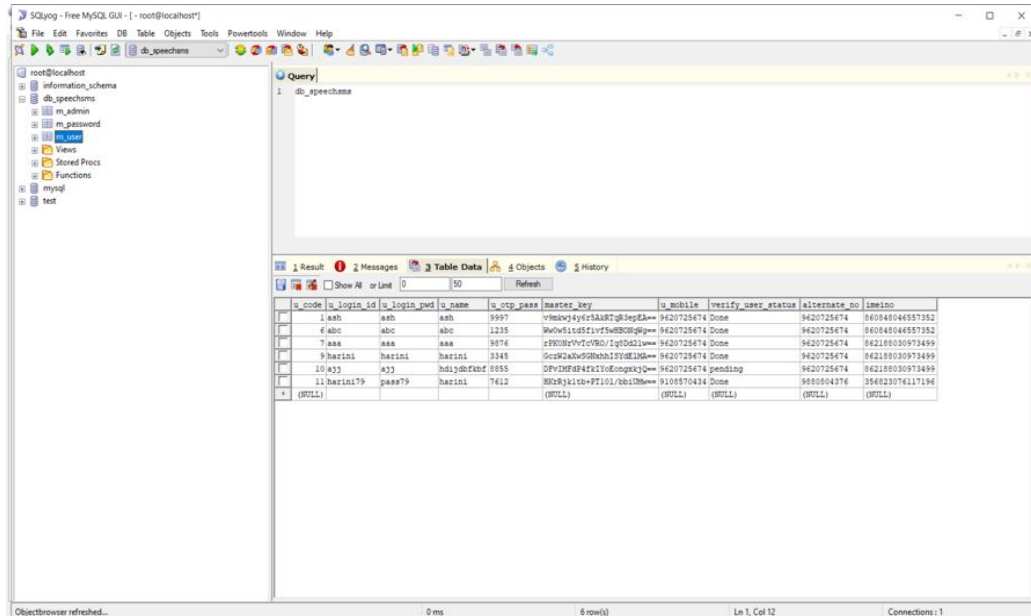


Fig.5- Master password stored in an encrypted format in the database when user first logs in

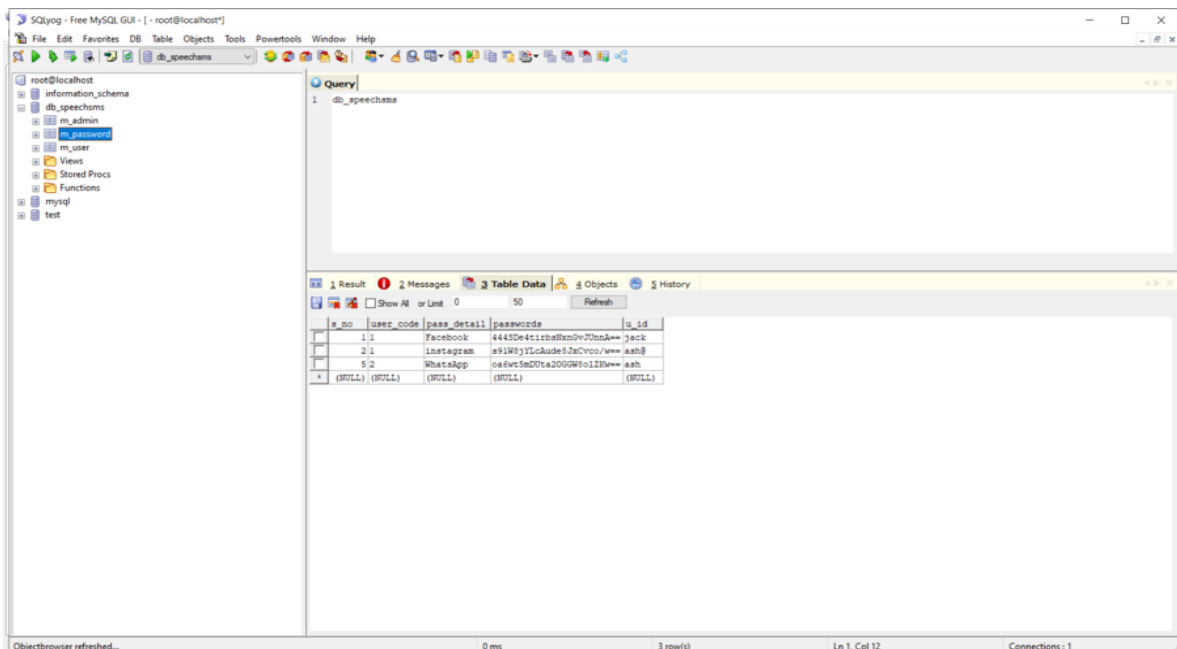


Fig.6- Master password in an encrypted format used to access. various social networking sites through voice commands

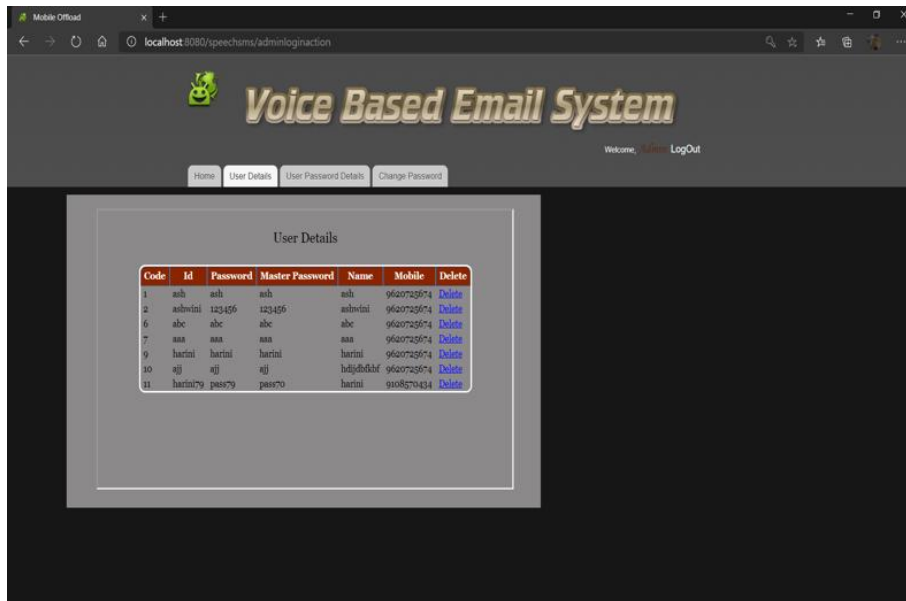


Fig-7 Admin login will enable the admin to view the decrypted password

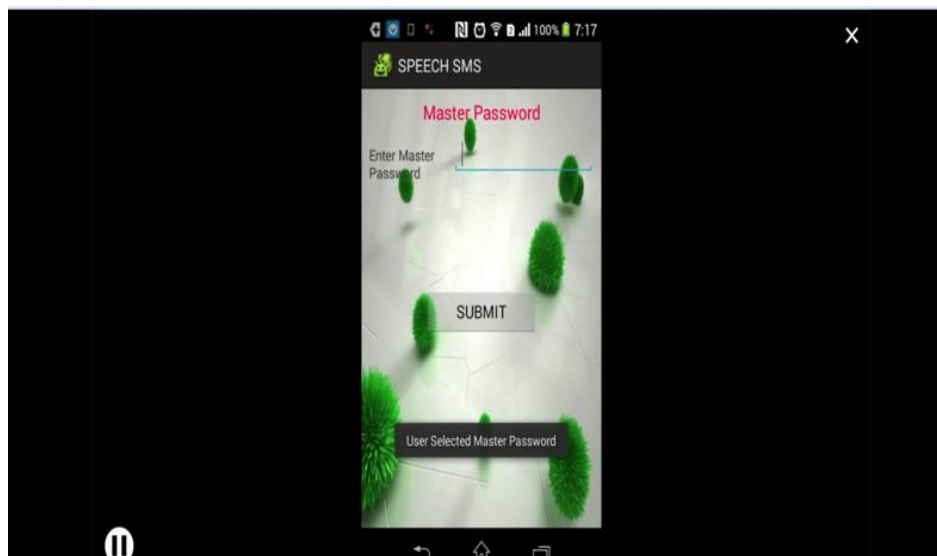


Fig-8-Receiving master password through voice commands

IV. CONCLUSION

The project aims at the betterment of society by making use of the latest technologies available to mankind and helping the needy in the best way possible. By taking up the task of developing more projects under this category it will motivate technologists to build more applications for the visually impaired. With the help of a smartphone the blind can virtually “see” and become more independent.

V. ACKNOWLEDGMENT

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