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Panchayat Service Management: An Interactive Web Application with the help of Voice

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Abstract*: *The paper titled "Panchayat service management: An interactive web application with the help of voice" is a website used for the efficient management of panchayat system. The online panchayat system ensures the smooth management of the various activities such as license and certificate issues. The user of this system can make use of these activities through the website. User authentication is provided by using fingerprint authentication system. In order to make the website an interactive one an Information Centre module is also incorporated.
Keywords: Information Centre; Fingerprint authentication.

I. INTRODUCTION

Agram Panchayat is the cornerstone of a local self-government organization in India. Many functions related to the development of that particular village or town is performed by the panchayat. In addition to the developmental activities, several services were offered by the panchayat which includes issuing of various certificates like birth certificate, marriage certificate, licenses for quarry, building and shops etc. For getting any of these certificate or license from the panchayat, manual methods were adopted. For that, at first they need to fill the application form and submit the form along with the supporting document. After the manual verification of the documents submitted, certificate will be issued from the panchayat office. If the applicants have any queries related to filling up of the application form or related to any of the services offered, they need to clarify their doubts from the office itself. In the case of people who were working somewhere else this will be a difficult task.

So there arises the need for automation of the services offered by the panchayat. Automation of the services should be done in such a way that not only to help the employees of the panchayat but also the users of the services should get the benefit. By automating the services, paper works get reduced to great extent and clarification of doubts related to the services become easier when compared to the conventional system.

The above mentioned scenario states that there is a requirement of alternative interaction technique(s). The use of spoken language as an input modality can help to overcome some limitations of the conventional system and thus, can improve the human-computer interaction [1].

Now a days, users prefers to use spoken language as an input modality for browsing over mouse, even if they can be quicker with a mouse, because it makes the interaction easier for them. For that, they issue commands by saying one or two keywords and based on that results will be displayed [2].

Taking these aspects into consideration, in order to automate the services offered by the panchayat and to make people aware about the upcoming developmental activities that are going to be implemented in the panchayat, a web application is developed. In addition to the above functionalities, web application is made as an interactive one by introducing voice interaction.

While developing a web application for issuing certificates or license, the authenticity of the users who are registering in this site for getting the same is an important factor. Since the chance for creation of fake profiles can't be neglected, there should be some effective mechanism to avoid such kinds of malpractices. The integration of biometrics can provide better verification performance. Biometrics will help to increase the robustness of the biometric systems against the spoofing attacks and solve the problem of non-universality [3].Biometrics has the characteristics such as extremely difficult to copy, share and difficulty to be lost or forgotten. Fingerprint is one of the biometrics, which has high universality, high performance distinctiveness and easy collectability [4].

Fingerprint authentication is one of the most widely used and reliable personal identification methods. However, manual fingerprint authentication is tedious, time-consuming, inaccurate and costly that it is not capable of meeting today's increasing performance necessities. So, an automatic fingerprint authentication system is needed. It plays a very essential role in forensic and civilian applications such as access control, criminal identification, and ATM card verification [5].

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II. PROPOSED SYSTEM

This section describes the proposed web application along with the block diagram of Information Centre and Fingerprint Authentication System. This web site is designed to get all information under one web service and to provide most up-to-date services. The proposed system is more reliable and robust than existing system as there is no more paper work. The advantages of the proposed system include:

A. High speed
B. Transparency
C. Time saving
D. Provide services to anyone at anytime

Here, we integrate the existing speech API (Google speech API) with our proposed interface called Online Panchayat. Block diagram of the Information Centre is shown in the figure1

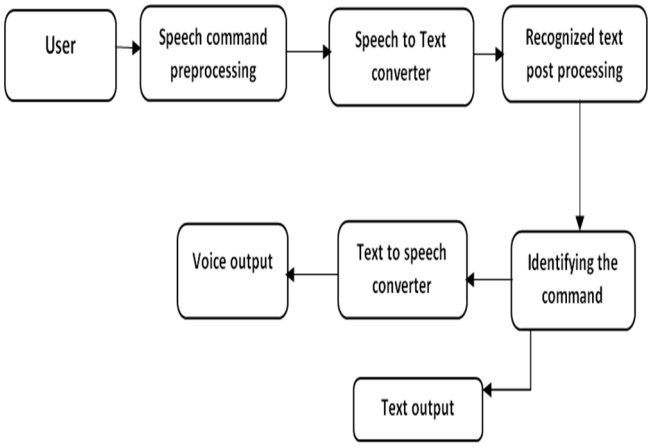

Figure 1. Block diagram of information Centre

In the web application named Online Panchayat, the user can interact with the system with the help of a microphone and enquire the queries related to the services offered by the panchayat. For this purpose a link is provided in the home page itself. At first the speech command given by the user will be recognized and is converted into text format by using speech to text converter. With the keyword thus obtained, the system will search in the local database whether there exist a file which supports the keyword or not. If such a file exists, the content of the file will be read and given as voice output with the help of text to speech converter. Text output is also provided.

For the purpose of authenticating the user a fingerprint authentication is also incorporated. There are four steps in fingerprint authentication process. They are:

E. Acquiring a Sample

In a complete, full implemented biometric system, a fingerprint scanner takes an observation.

F. Extracting Features

The relevant data is extracted from the predefined capture sample. The outcome of this step is a biometric template which is a reduced set of data that represents the unique features of the enrolled user.

G. Comparison of Templates

Step will be a comparison between a given picture for the subject and all biometric templates stored on a database. For verification, the biometric template of the claimed identity will be retrieved (from the database) and this will be compared with the newly obtained sample.

H. Declaring a Match

The Fingerprint authentication system declare a match if the comparison yields a 100% match.

Only after the completion of the verification process the user will be able to apply for the various services offered by the panchayat.

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Block diagram of the Fingerprint authentication system is shown in the figure 2.

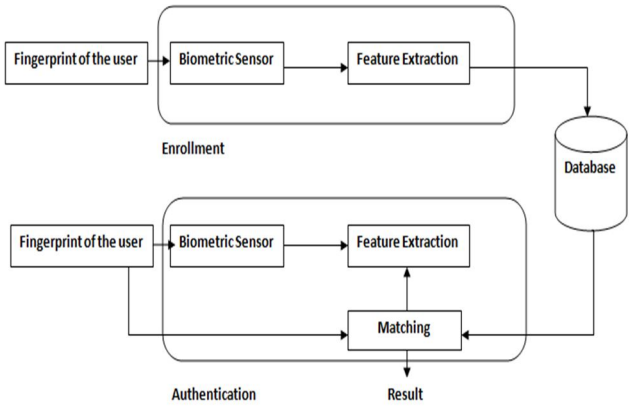

Figure2. Block diagram of fingerprint authentication system

III. PANCHAYAT SERVICE MANAGEMENT INTERFACE IMPLEMENTATION

The above mentioned methodology was implemented in panchayat service management system with Java and JSP technology. Here, we restrict our development to English language by which all the resulting information are provided to the user. The implementation detail of each module is given below.

In the panchayat service management interface, the users can apply for various certificates provided from panchayat. This is possible only after the completion of user registration and user verification.

For the purpose of user authentication, fingerprint authentication system is also incorporated. Fingerprint sample is acquired using fingerprint scanner, which will be then compared with the samples present in the database which were uploaded by the user during the user registration. The user will be approved only if a 100 percent match is obtained. Only after the approval, the user will be able to apply for the certificate/ license. Figure 3 shows the homepage of the web application.

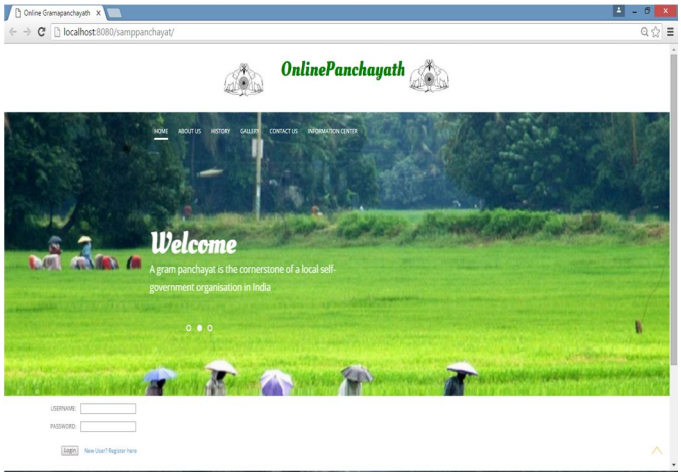

Figure 3.Homepage of the web application

Once the user gets approved, application can be submitted with the supporting documents. After the verification of the details submitted, an email will be send from the panchayat to inform about the status of the application. If it is approved, the user can pay the fees for the certificate and can take as many printout of the certificate.

At any point, either during the registration process or during the time of making payment etc. any query related to any of the services or related any of the steps that is to be followed, the user can ask doubts by clicking on the information Centre link provided in the homepage. With the help of a microphone the users can ask his queries. The information related to the queries enquired will be given in textual as well as spoken form. Information Centre webpage is shown in the figure 4.

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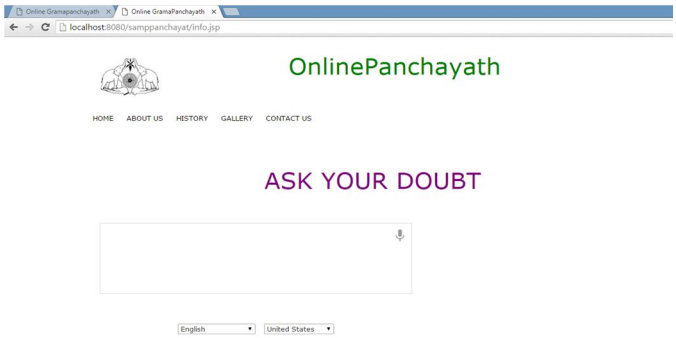

Figure4. Information Centre webpage

IV. CONCLUSION

A speech recognizer is used in our proposed work for making better interaction with the web application with the help of voice. This recognizer is capable of real time, medium vocabulary speech recognition. By this we can recognize words provide input in the form of voice and get the result in the form of voice. In this we are giving the keywords as input for getting the information related to our query. In order to authenticate user's, a fingerprint authentication system is also incorporated. As a future work, a mobile app can also be developed.

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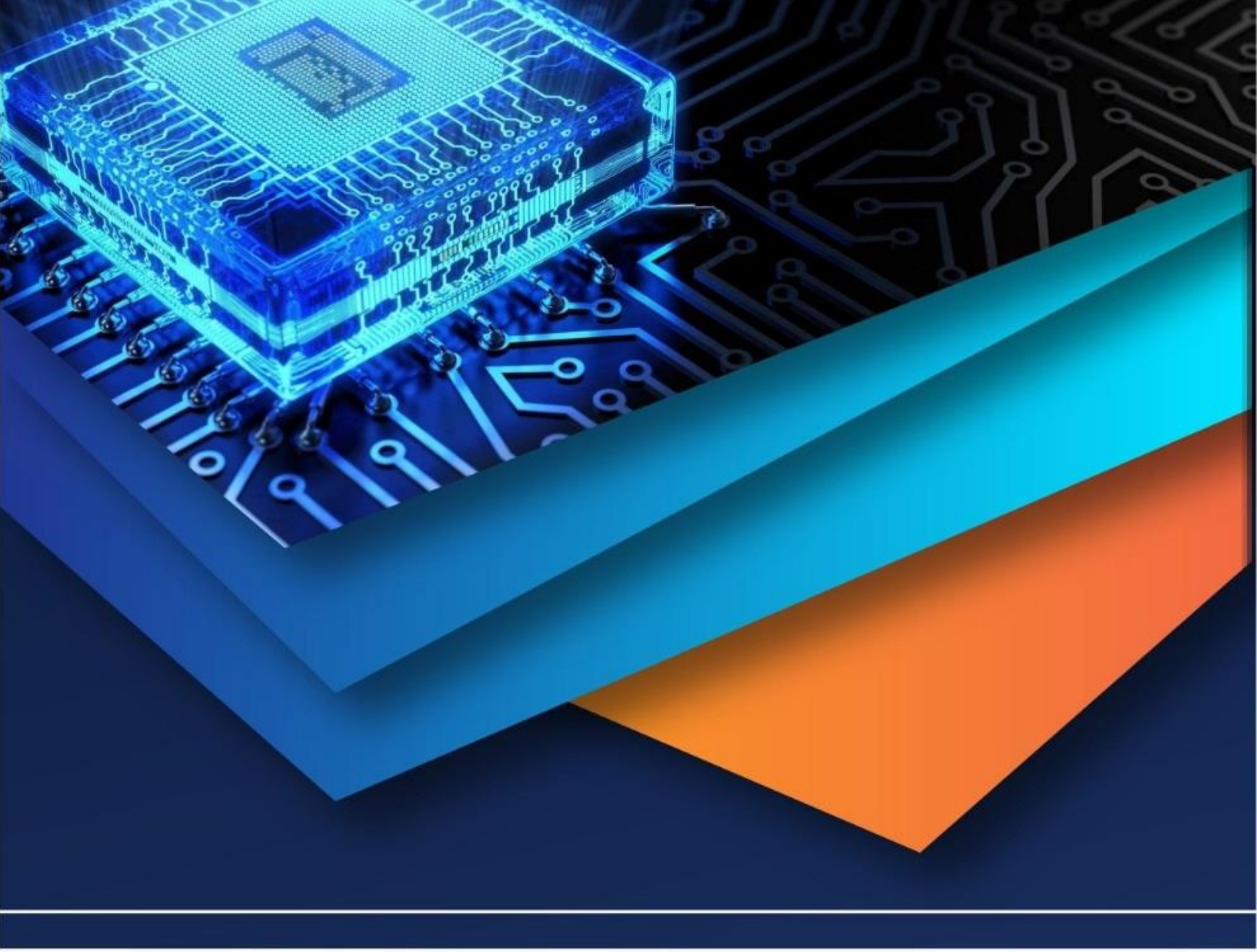

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