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Medical Mirror Using Face Recognition

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ABSTRACT: We propose a video surveillance system based on blockchain system. The proposed system consists of a blockchain network with trusted internal managers. The metadata of the video is recorded on the distributed ledger of the blockchain, thereby blocking the possibility of forgery of the data. The proposed architecture encrypts and stores the video, creates a license within the blockchain, and exports the video. Since the decryption key for the video is managed by the private DB of the blockchain, it is not leaked by the internal manager unauthorizedly. In addition, the internal administrator can manage and export videos safely by exporting the license generated in the blockchain to the DRM-applied video player.

KEYWORDS: Smart Mirror, Medical Data, Database.

I. INTRODUCTION

Internet of Things (IoT) is a term used to describe “technologies, systems, and design principles associated with the emerging wave of Internet-connected things that are based on the physical environment”. It refers to a network of uniquely identifiable things (objects) and their virtual representations in an Internet-like structure, which are able to collect and exchange data and are remotely controlled across existing network infrastructure. It comprises of major components including sensing function, heterogeneous access, information processing, security, privacy, and applications and services. According to the International Telecommunication Union (2013), the term Internet of Things (IoT) is defined as a global structure for society that enables Internet service to connect to physical matter based on information and communication technologies available. IoT is also seen in a broader perspective and nonetheless brings quite a huge implication of technology on society. Along with the development of technology, various information can be found easily and the emergence of the concept of Smart Mirror Smart Edducation has become increasingly widespread. The Smart Mirror system which is based on the concept of Internet of Things (IoT) is developed specifically to allow users to manage and control education levels through voice recognition. In this case, it has been identified as the main problem faced by most people. There are just too many things to be done at one time and at certain point, users are not able to multitask such daunting chores. For example, when a to-do-list with a number of studies has been recorded on a paper, but the paper is lost because it is misplaced. Another example is when users are too busy managing their daily activities until some trivial-yet-critical things have happened, which can eventually lead to energy wastage.

II. PROBLEM STATEMENT

In the existing system managing education related things were done by the people themselves which led them to face many problems and it has been identified as the main problem faced by most people.
There are just too many things to be done at one time and at certain point, users are not able to multitask such daunting chores.There are plethoras of Smart Mirrors in existence by now. Mostly, developed to display time, date, and weather-related information. But you will hardly find all these features in a single Smart Mirror. Especially in India, this concept has not made strides yet. Also, human detection system is not implemented into Smart Mirrors on a large scale. By implementing human detection module, one can get instant control along with that can save electricity.

III. PROPOSED SYSTEM

In the proposed system, we develop an android application. This android application is connected to the smart mirror through Wi-Fi. When the user opens the presentation in his/her android mobile it automatically gets projected in the smart mirror. While connecting the device with the smart mirror its going to display the information to the smart screen so it enables the user to smartly handle and organize the various study levels in an efficient manner.

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IV. METHODOLOGY

In our work we used some modules, these modules/methodology are listed below.

Initial setup:

In this system, admin can add patient detail and medical report. Admin can update medical reports. Admin is able to add patient picture for face detection and recognition. Admin can check all record and patient detail from web application.

Voice Control: To interact with the mirror it uses microphones. Microphone is using to power the voice recognition capabilities. The first microphone is a simple one connected

Through a USB sound card and Raspberry Pi

Motion Sensing: Using a PIR sensor for your Raspberry Pi you can have your display turn on only when there is someone in the room. PIR sensor will detect the human.

Facial Recognition: In this project, we are using machine learning algorithm SVM for recognizing the patient. Camera placed behind the mirror is used to recognize the user standing in front of the mirror. By recognizing the person, the mirror knows how to interact or behave next.

Medicine box: after recognized, if medicine is needed then medicine box will be open for particular patient.

V. SYSTEM ARCHITECTURE

The architecture of a system describes its major components, their relationships (structures), and how they interact with each other. Software architecture and design includes several contributory factors such as Business strategy, quality attributes, human dynamics, design, and IT environment. We can segregate Software Architecture and Design into two distinct phases: Software Architecture and Software Design. In Architecture, nonfunctional decisions are cast and separated by the functional requirements. In Design, functional requirements are accomplished

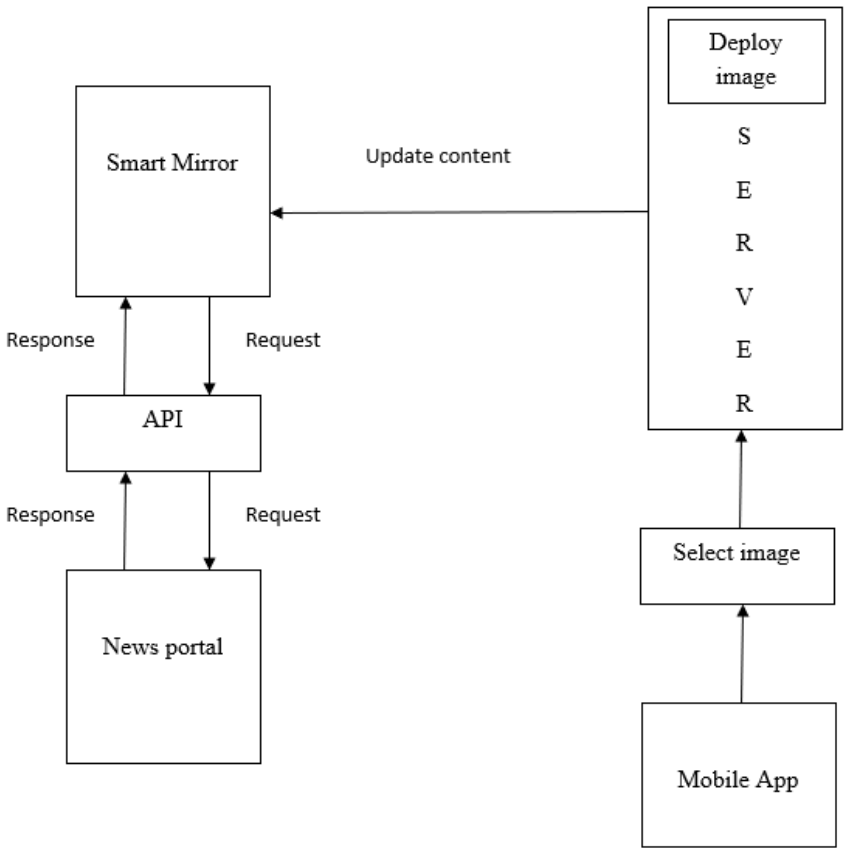


Fig 1: System Architecture

VI. IMPEMENTATION

Prototype of the Project:

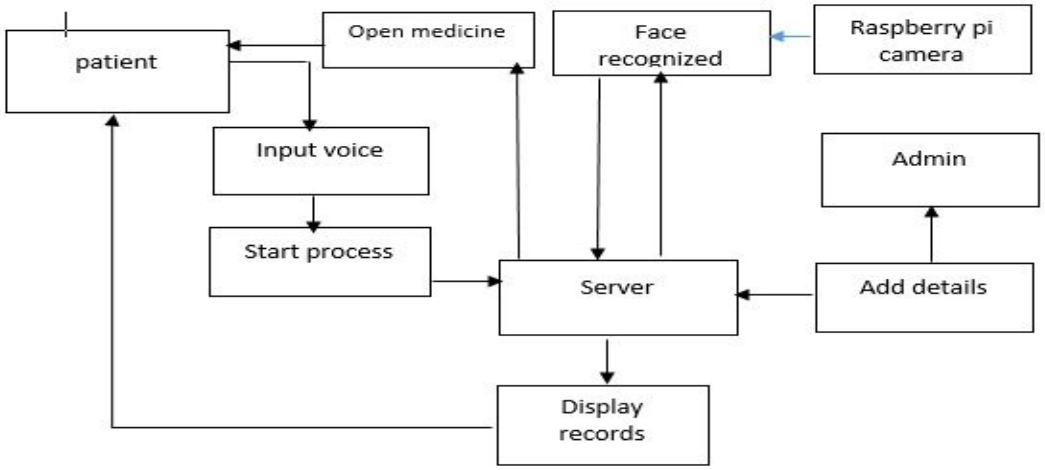


Fig 2: Implementation of the overall System

Methodology

1. **Registration**
2. **Update details**
3. **Face Recognition**
4. **Display Information**

Registration

Admin first login into the portal to add the patient details. Admin can add the patient details along with the face image. All these details are saved in the application server. The patient details are sent from web browser to the application server using HTTP protocol. The students details are saved in the my sql database. The captured customer face images are trained in the server using Linear Support Vector Machine (LSVM) and the trained model will be updated. Admin can add the patient details and provides the login credential.

Update details

Admin can login into the portal and add or update patients report details.
The patient details are stored in the mysql database.

Face Recognition

HOG image descriptors and Linear Support Vector Machine (LSVM) are used to train. Certain steps are to be followed in HOG. They are:
• Extracting HOG descriptors from the positive samples of trained images.
• Extracting HOG descriptors from the negative samples that don't contain any objects.
• Training LSVM on the samples.
• Testing with dataset.
• Finally face recognition is done by using Euclidean distance method.
Server fetch the corresponding patient id and send back to the controller.

Display Information
As soon as server recognizes the patient, it fetches the patient information from database and send to the raspberry pi connected to the smart mirror. On receiving the information, raspberry pi displays the information on the smart mirror

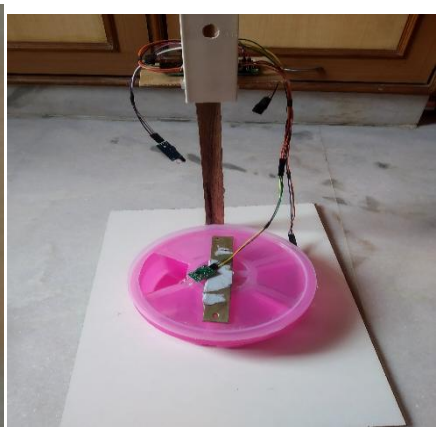
and welcomes the patient using test to speech API. The smart mirror is fitted with a microphone. If any patient wants to check his/her report or any other information can input the speech input. Raspberry Pi process the speech and converts into text using google TTS API. Based on the query raspberry pi send request to the server and get the data from the server and displays on the screen.

Medicine Box

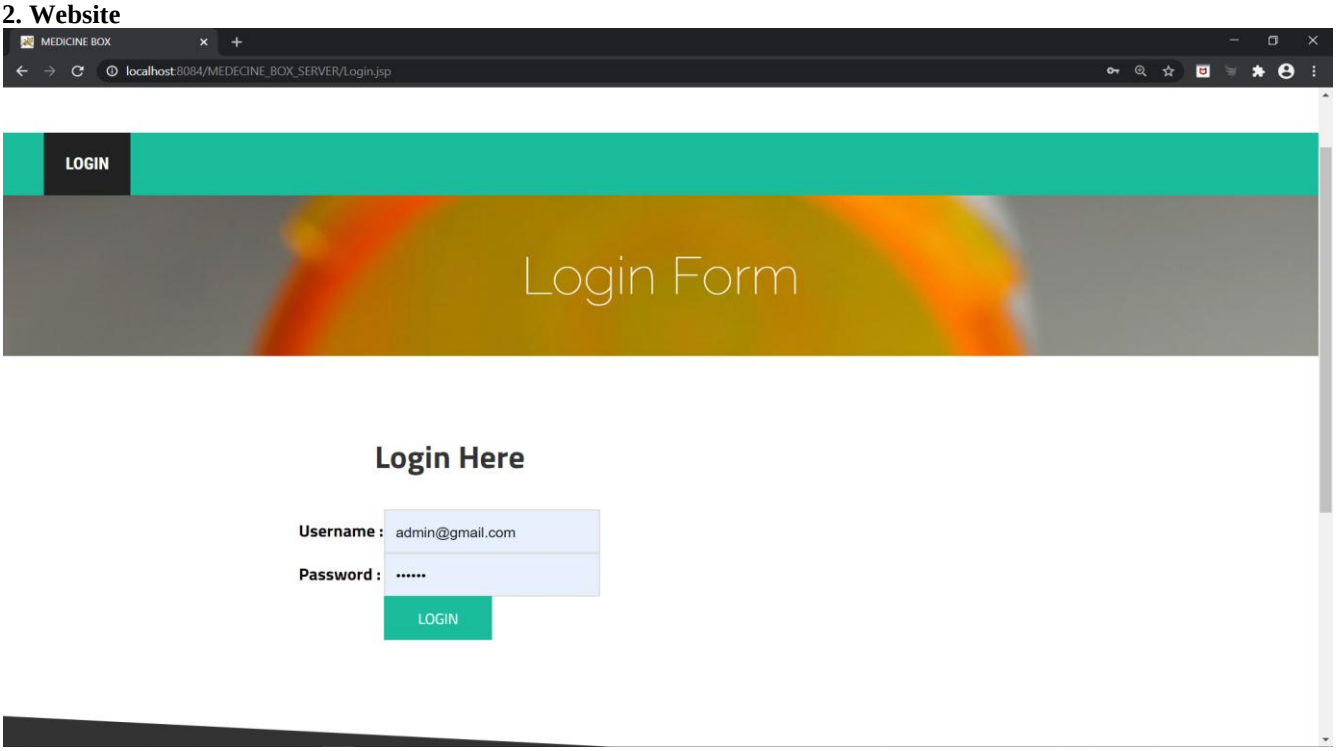
The Medicine Box is made of server motor which is controlled by the code to rotate at certain degrees. It includes 4 slots for
The medicine and based upon the patients data the medicine box rotates and provides the particular medicine .It also has an IR sensor attached which detects the motion and updates the details if the patient has taken the particular medicine or not

Pictures

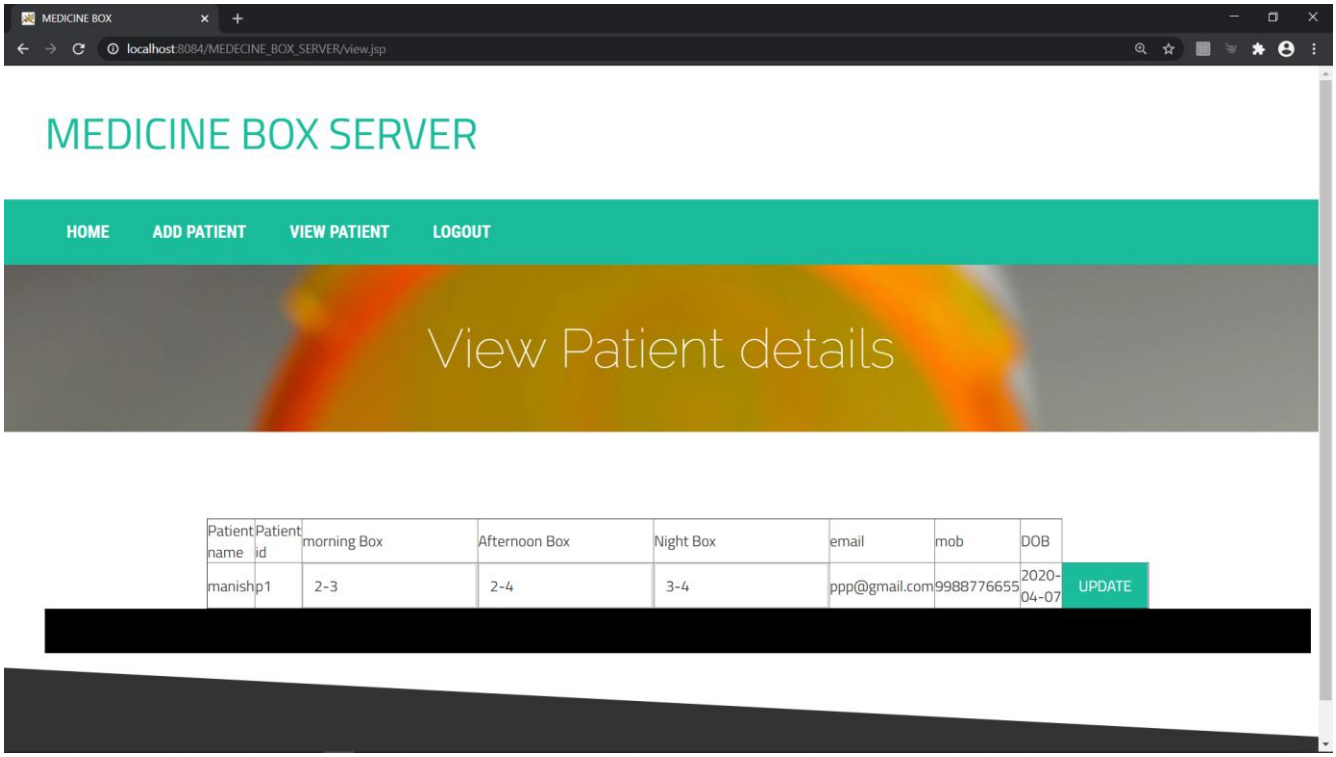
1.Project



2. Website

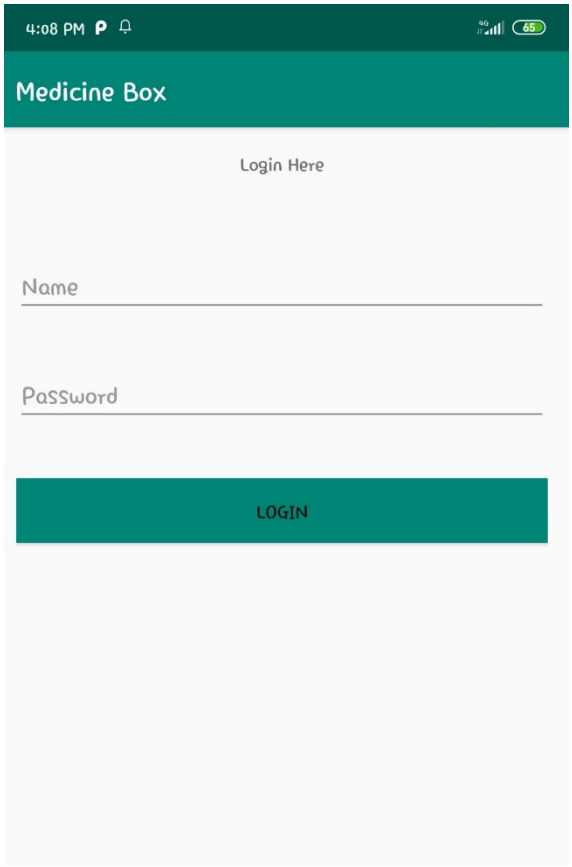


Login page



Patient details

3.Android App



App login

Patient details

VII. RESULT

The Users who want to access the videos which are uploaded into the blockchain can register themselves in the "BLOCKCAIN VSS" website. They are provided with all the options to change their password or their credentials in case they want to edit. The users need to verify themselves by providing the portal with their registered email and phone number, a code will be sent to both, by entering both the codes in the portal a user gets verified. After his/her verification the user can download the desired videos which are present in the blockchain network in a read only format i.e, he/she can only view the videos and cannot make any changes to it.

VIII. CONCLUSION AND FUTURE WORK

As a conclusion, the application is the new technology for smart life. From the result testing, most of the function of the application are functioning well and there still need some improvement to the development of the newest functionality on smart mirror.

We have designed futuristic smart mirror that provides natural interaction between patients and the ambient medical services. The mirror display is provided by a flat led display monitor which display all the necessary information which are useful for the patient.

The mirror also provides a picture-in-picture sub-display to facilitate the display of services such as reports, prescriptions and other important patient details.

Future scope: in our future work we will investigate how the surrounding context of the patient and the environment can be utilized in order to provide optimal service experiences in the home environment.

The system can be made much more useful to the patients by adding more functionality like integrating speech processing, medicine disposal etc

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