

# Fingerprint Based Patient Health Record

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**Abstract-** *An Automated Teller Machine (ATM) in medical field can be used to collect the patients reports, book an appointment to visit the can be made instantly and safely. Biometrics is a method of recognizing a person unique physiological characteristic or behavioral characteristic. This system serves the dual purpose of safeguarding data confidentiality in both healthcare records and financial transactions. Various biometric modalities, such as facial recognition, iris scanning, retinal scanning, fingerprint analysis, hand geometry, handwriting analysis, and voice recognition, are employed for authentication. Biometrics based medical information system is introduces the efficient way to store patient's clinical records. The methods used in this project for storing and recollecting the patient records is fingerprint recognition technique. As all the people in the world have unique fingerprint it is an easy and secured process. The storage footprint for the fingerprint template is minimal, necessitating only a small amount of memory space. Patients are waiting for long time in the hospital to collect their reports. To overcome this certain problem a medical ATM can be set outside the hospitals. There patients can also book their appointment to visit the particular doctor. Once the appointment is been confirmed a mail will be sent to the patients.*

## I. INTRODUCTION

In an era of advancing digitalization and heightened concerns over data security and accessibility, the healthcare industry stands at a pivotal junction. The traditional methods of maintaining patient health records, often burdened by paper trails and susceptible to errors, are gradually being replaced by innovative technological solutions. Among these, fingerprint-based patient health record systems have emerged as a promising avenue, offering a seamless blend of security, efficiency, and accessibility. This final report encapsulates the culmination of extensive research, development, and implementation efforts aimed at evaluating the feasibility and efficacy of a fingerprint-based patient health record system within our healthcare facility. Throughout this report, we delve into the rationale behind adopting such a system, explore its technical underpinnings, assess its practical implications on patient care and administrative workflows, and reflect on the overall benefits and challenges encountered during its deployment. The transition from conventional

methods of health record management to a biometrically enabled framework represents not only a paradigm shift in how we perceive data security and patient privacy but also underscores our commitment to leveraging cutting-edge technologies to enhance the quality and efficiency of healthcare delivery. Within these pages lie not just the findings and outcomes of our endeavors but also a roadmap for future advancements in the realm of healthcare informatics. It is our fervent hope that this report serves as a catalyst for informed discourse, strategic decision-making, and, above all, the continued pursuit of excellence in patient-centric care.

## II. DEVELOPMENT TOOLS AND TECHNOLOGIES

It sounds like you're working on a project involving fingerprint-based patient health records and using TensorFlow as one of your development tools. TensorFlow is a popular open-source machine learning framework developed by Google, widely used for various applications including image recognition, natural language processing, and more. Using fingerprint biometrics for patient health records can offer several advantages in terms of security and convenience. TensorFlow could be employed for tasks such as fingerprint image processing, feature extraction, and even building machine learning models for biometric authentication.

## III. LITERATURE REVIEW

the form of knowledge and data. Medical knowledge is increasing virtually on a daily basis. More complex data have to be tracked for patients over the course of their lives. At the same time as the quantity and complexity of patient data are increasing, there is a greater demand for data to support activities other than direct patient care. Medical record need every day to be accessed also for administrative, economic and legal purposes. Medical institutions have felt the need for a well structured medical Computer-based Patient Record (CPR) for at least 20 years now. Extensive analysis and research [1] of what should a CPR look like and how it must be structured conclude that it must have the following elements: personal data (demographic and administrative), medical history list, data security and integrity, authorized access only, remote multi-access, medical examinations and tests, links to medical databases, etc. Hospital Information Systems (HIS) were designed with the intention of fulfilling

this objective. Along with controlling and managing the Hospital's administrative data, many systems have incorporated CPRs. The main goal was to centralize data, make automatic charging and billings. Till now many Institutions has realised such systems using different platforms, mainly UNIX mainframe systems. Recent developments in network and information systems technologies have created new tools, thus opening new communication capabilities. The day by day booming use of Internet and its user friendly graphical user interfaces along with the new client-server architecture that has been introduced, have been combined into what is called an Intranet. Medical institutions have recognized the necessity of a well-organized Computer-based Patient Record (CPR) for approximately two decades. Hospital Information Systems (HIS) were conceived to servethat purpose. A pilot application is being developed to serve the needs of management of Inpatient and Outpatient Medical Record, the mechanism of patients' visits and bed reservation from the GP's (General Practitioners) as well as the management of the drug store. With these requirements in consideration, we devised an Intranet Web Client-Server application. This system offers an intuitive graphical interface and incorporates functionalities including Internet connectivity, access to comprehensive electronic patient records, remote accessibility, and more. The entirety of the application was crafted as an ActiveX Document, enabling users to download it from a Web Server and execute it directly within a Web Browser. The scope of this Intranet basedHospital Information System is to improve the quality of health care provision, to minimize the Institution's costs, to ameliorate time management, to increase training capabilities and to improve remote patient record access. This solution aims to enhance patient satisfaction by minimizing waiting times and boosting staff morale through the implementation of advanced information systems and robust infrastructure.

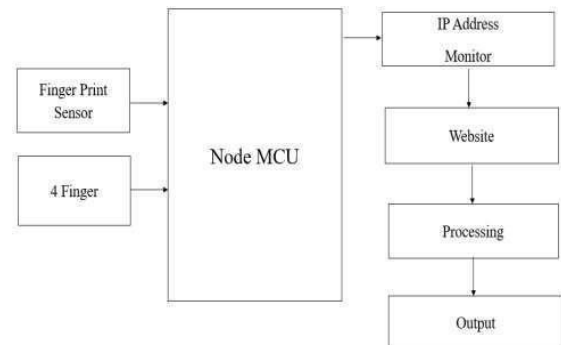
#### IV. PROPOSED METHODOLOGY

This proposed system follows the below procedure. Initially the patient's finger print is enrolled during the admission, so that it will be easy to access the data whenever required. Incase if patient fails to bring the report which was previously issued, this method will be helpful to retrieve the data. These details will be stored in the system and viewed as well. Later it can also be downloaded. It also helps to fix appointments with the doctor based on the availability which is viewed through system. When the appointment is confirmed, you will receive a mail.

##### 4.1 Advantages:

Unique- Everyone has the different and unique fingerprint Fingerprints have loops and archeswhich vary from person to person. Accurate-The information obtained from the fingerprints is accurate as it different to everyperson and is easily comparable with the candidate fingerprint images stored in the database. Small storage space- The memory required to store the fingerprint template is small andrequires less memory space.

##### 4.2 Block Diagram:



##### 4.3 Research and Requirement Gathering:

Understand the current patient health record systems in place Identify the shortcomings and challenges faced by healthcare providers in managing patient records ,Gather requirements from healthcare professionals regarding the functionalities and features expected in the new system.

##### 4.4 Fingerprint Biometric System Selection:

Research different fingerprint biometric systems available in the markEvaluate the accuracy, reliability, and scalability of each systemSelect the most suitable fingerprint biometric system based on the requirements and budget constraints.

##### 4.5 System Design:

Design the architecture of the fingerprint-based patient health record system Define the database schema for storing patient information securely Determine the integration points with existing hospital management systems, if any Design the user interface for healthcare professionals to access and manage patient records.

##### 4.6 Fingerprint Data Collection:

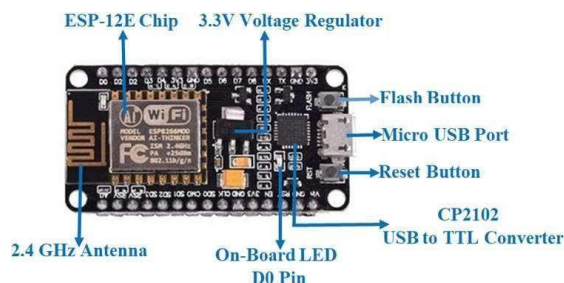
Develop a mechanism for collecting finger print data from patients Ensure compliance with data protection

regulations and ethical considerations Test the fingerprint data collection process to ensure accuracy and reliability.

**4.7 Fingerprint Template Generation:**

Develop algorithms for converting raw fingerprint data into templates Implement methods for storing and indexing fingerprint templates in the database. Test the fingerprint template generation process with a diverse set of fingerprints to ensure robustness.

**4.8 NodeMCU ESP8266**



**4.9 NodeMCU ESP8266 ArduinoIDE**

The Node MCU Development Board can be easily programmed with Arduino IDE since it is easy to use. Programming Node MCU with the Arduino IDE will hardly take 5-10 minutes. All you need is the Arduino IDE, a USB cable and the Node MCU board itself.

**V. HARDWARE & SOFTWARE**

**5.1 Fingerprint Sensor**



A finger print sensor with TTLUART interface. The user can store the fingerprint data in the module and can configure it in 1:1 or 1: N mode for identifying the person. The FP module can directly interface with 3.3 or 5v Microcontroller. A level converter (like MAX232) is required for interfacing with PC serial port. R307 Fingerprint Module consists of high- speed DSP processor, high performance fingerprint alignment algorithm, high-capacity FLASH chips and other hardware and software composition, stable

performance, simple structure, with fingerprint entry, image processing, fingerprint matching, search and template storage and other functions.

**5.2 Arduino IDE**

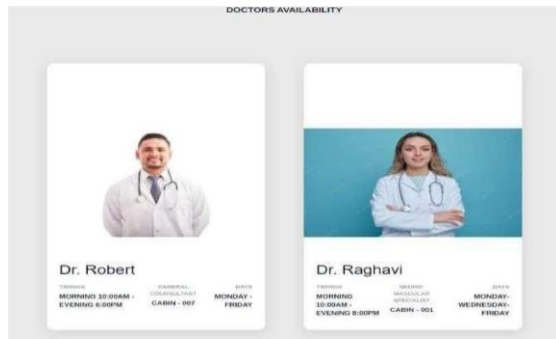
The Arduino Integrated Development Environment - or Arduino Software (IDE) contains a text editor for writincode, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuinohardware to upload programs and communication with them.

**5.3 CONCLUSION**

The Fingerprint Based Patient System was specifically developed for storing, monitoring and analyzing the patient medical reports. The system uses the fingerprint scanner for retrieving the patient details from the system. This system will allow users to access hospital’s information anytime. The integrated database, s.The aim of this work was to provide reliable healthcare web-based system. It is enhance the provided services to patients by making their records available online and everywhere for physician to follow up the case easily with less effort, and their history would be available also.

**5.4 Output image**





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