AN IOT BASED ACCIDENT MANAGEMENT SYSTEM WITH REDUCED TIME DELAY FOR   EMERGENCY RESCUE SERVICES

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Abstract: With an increase in population, there is an increase in the number of accidents that happen every minute. These road accidents are unpredictable. There are situations where most of the accidents could not be reported properly to the police station on time. In most of the cases, there is the unavailability of emergency services which lack in providing the first aid and timely service which can lead to loss of life by some minutes. Hence, there is a need to develop a system that caters to all these problems and can effectively function to overcome the delay time caused by the medical vehicles. The purpose of this project is to introduce a framework using IoT, which helps in detecting Accidental person details from the database using fingerprint sensor and notifying them immediately to corresponding police station and hospital. This system reduces the time to report to the police of the accident situation.

Keywords: Arduino UNO, IoT, Fingerprint Sensor, Embedded.

I. INTRODUCTION

Internet of Things (IoT) is referred to as the interconnection of physical objects that have anIP address for Internet connectivity. A huge number of smart devices are interconnected to theInternet today. There is an exponential growth in the number of smart devices interconnectedthrough the mobile Internet . IoT can be used in architectures, such as the proposal presented in, which represents an architecture for two-way communication between smart utility meters and utility companies. Is a wireless sensor network that provides communication for metering devices in the neighborhood area of a smart grid. Another point that is addressed in IoT is mobility, which is a fundamental issue related to the detection of mobile nodes movement and the provision of better links through an efficient routes selection .Many contributions are evidenced in the literature in the IoT topic, such as the following: study of mechanisms for the topology control , location andmobility in Wireless Sensor Networks (WSNs) and routing based on objective functions . It is considered also as pervasive presence of devices variety, such as sensors, Radio Frequency Identification (RFID) tags and smartphones, among other devices which can interact with each other for a common purpose. In a scenario of IoT, plurality is increasing and forecasts indicate that over 40 billion devices will be connected until 2020, allowing the emergence of an infinity of new applications, such as for smart cities, healthcare, smart houses, industry, agriculture, etc.

In the modern era, traffic congestion is increasing exponentially. It is estimated worldwide that by 2020 there will be more than 1 billion vehicles leading to stifling levels of congestion. The number of vehicles is increasing at a rapid rate. This has aided traffic congestion in the cities that manytimes lead the way to a severe collision. Moreover, the growth in road traffic, emergency carriers cannot reach their destination which is the main cause of loss of valuable lives.In this regard, the Several kinds of research have been performed on the accident management system. However the researchers do not focus on producing an efficient solution to manage the Accident event. The random waypoint mobility and RPLA routing protocol is the best for transmitting the data wirelessly.

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II.EXISTING SYSTEM

In the existing system, a Novel architecture for accident management systems is Proposed. Several kinds of research have been performed on The accident management system. However the researchers do Not focus on producing an efficient solution to manage the Accident event. The random waypoint mobility and RPL A routing protocol is the best for transmitting the data wirelessly.The disadvantages of existing system are there is no effective solution toreport the accidents to police station on time and to give timely treatment to the accident prone victims

III.PROPOSED SYSTEM

In the proposed system, fingerprint sensor based speed dial system for road accident management system. This system is stored the overall people's details into the database for using human accident rescue time. Using IoT to collect the data from the database and send to hospital and police station.
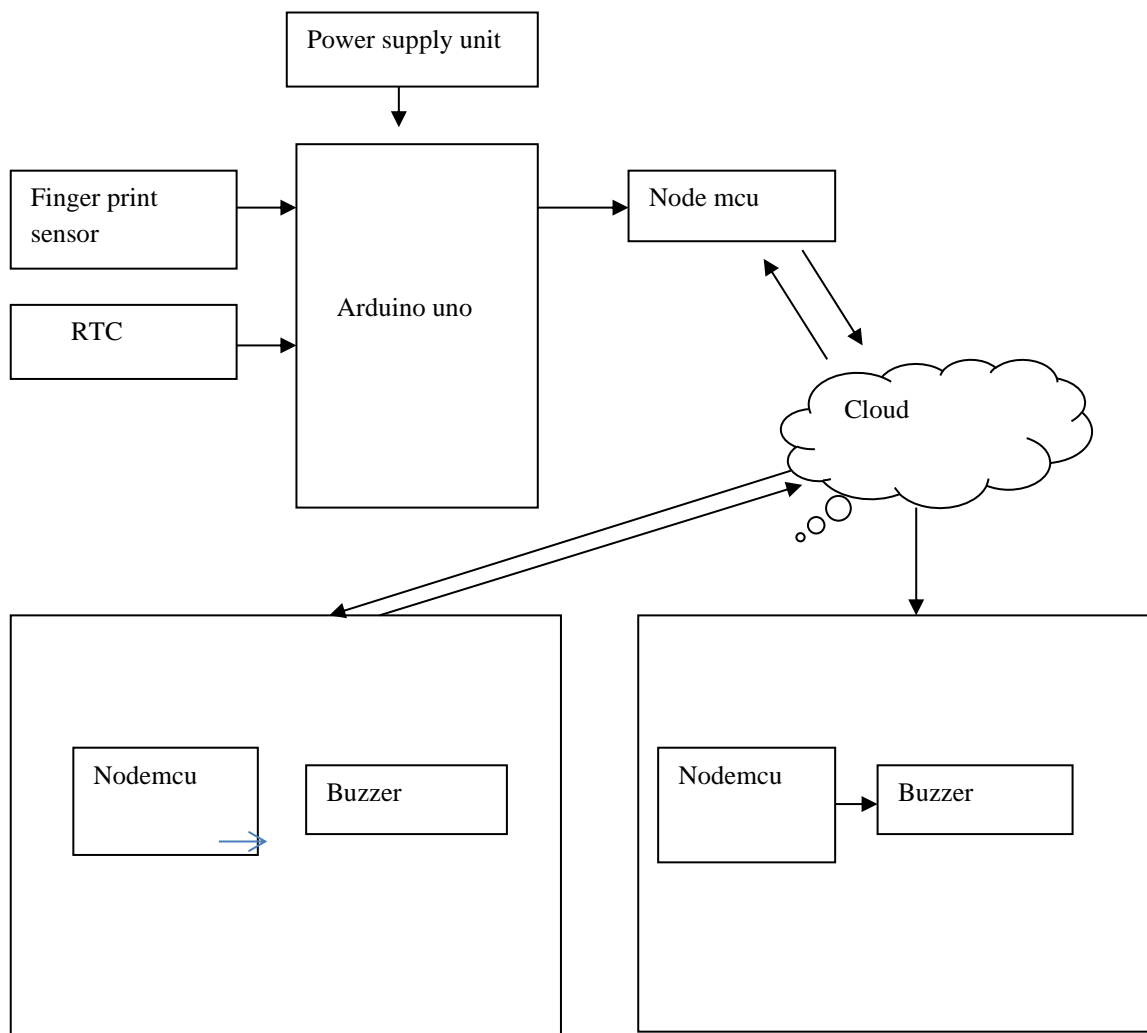
IV.BLOCK DIAGRAM

Fig 1: BLOCK DIAGRAM OF PROPOSED SYSTEM

V.BLOCK DIAGRAM DESCRIPTION

Above the block diagram is containing Arduino UNO, three ESP8266, three buzzer, Biometric sensor, RTC and power supply unit. Fingerprint sensor is connected to Arduino UNO by using the UART protocol. Biometric sensor is used to get finger print from accidental person and give it to Arduino UNO. this unknown finger print send from arduino uno to ESP8266 by using UART port. ESP8266 comparing the accidental person finger print with over all peoples finger print database. If any matches found from the database, it will send to the police station for case register and again this details send from police station to corresponding hospital.

VI.SYSTEM DESIGN

HARDWARE MODULE

a. Arduino Uno

b. Liquid Crystal Display

c. ESP8266

d. Biometric Sensor

e. Power Supply Unit

f. GPRS Mode

SOFTWARE MODULE

a.Arduino IDE

FIREBASE

Firebase is a mobile and web app development platform that provides developers with a plethora of tools and services to help them develop high-quality apps, grow their user base, and earn more profit.

VII.WEBPAGE DEVELOPMENT

Web development refers to building website and deploying on the web. Web development requires use of scripting languages both at the server end as well as at client end. Webpage for hospital and police station were designed using HTML, CSS, Javascript.

HYPER TEXT MARKUP LANGUAGE (HTML)

The Hyper Text Markup Language, or HTML(Hyper Text Markup Language) is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

CASCADING STYLE SHEETS (CSS)

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML.CSS is a cornerstone technology of the World Wide Web, alongside HTML and

JavaScript.CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts.[3] This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file which reduces complexity and repetition in the structural content as well as enabling the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

JAVASCRIPT

JavaScript often abbreviated as JS, is a programming language that conforms to the ECMAScript specification. JavaScript is high-level, often just-in-time compiled, and multi-paradigm. It has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions. Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web. JavaScript enables interactive web pages and is an essential part of web applications. The vast majority of websites use it for client-side page behaviour, and all major web browsers have a dedicated JavaScript engine to execute it.
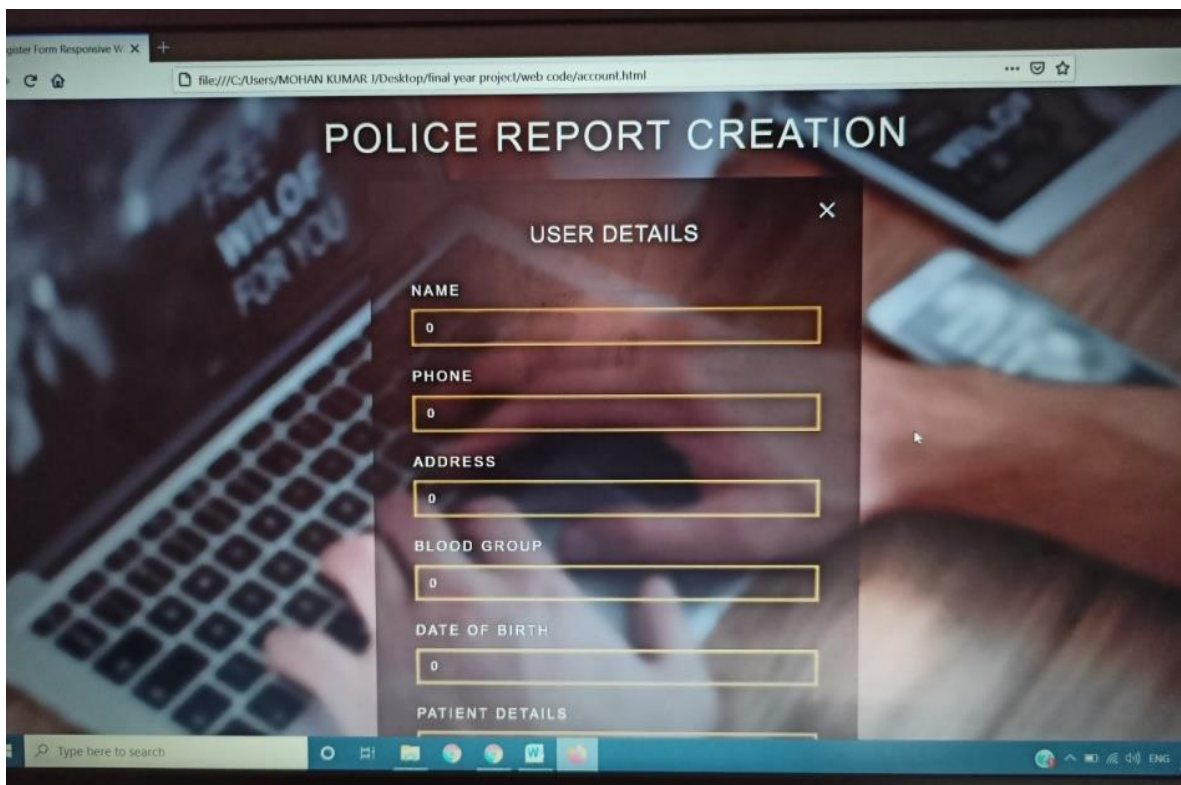

Fig 2: WEBPAGE FOR POLICE STATION

This web page is mainly created for registering accident cases to the police station. Using database and hardware kit specifically arduino, this is possible. Data which we collected are stored in firebase and when it detects the finger print of that particular person, it will display all the stored details of the patients in the ambulance. The nurse inside the ambulance will get the details first and nurse will send the data through cloud to the police station. In the police station, there will be an alarm which beeps when information received. After receiving the information, police needs to confirm the information. They also get the location details of the person by which the same information is also shared with the hospital.
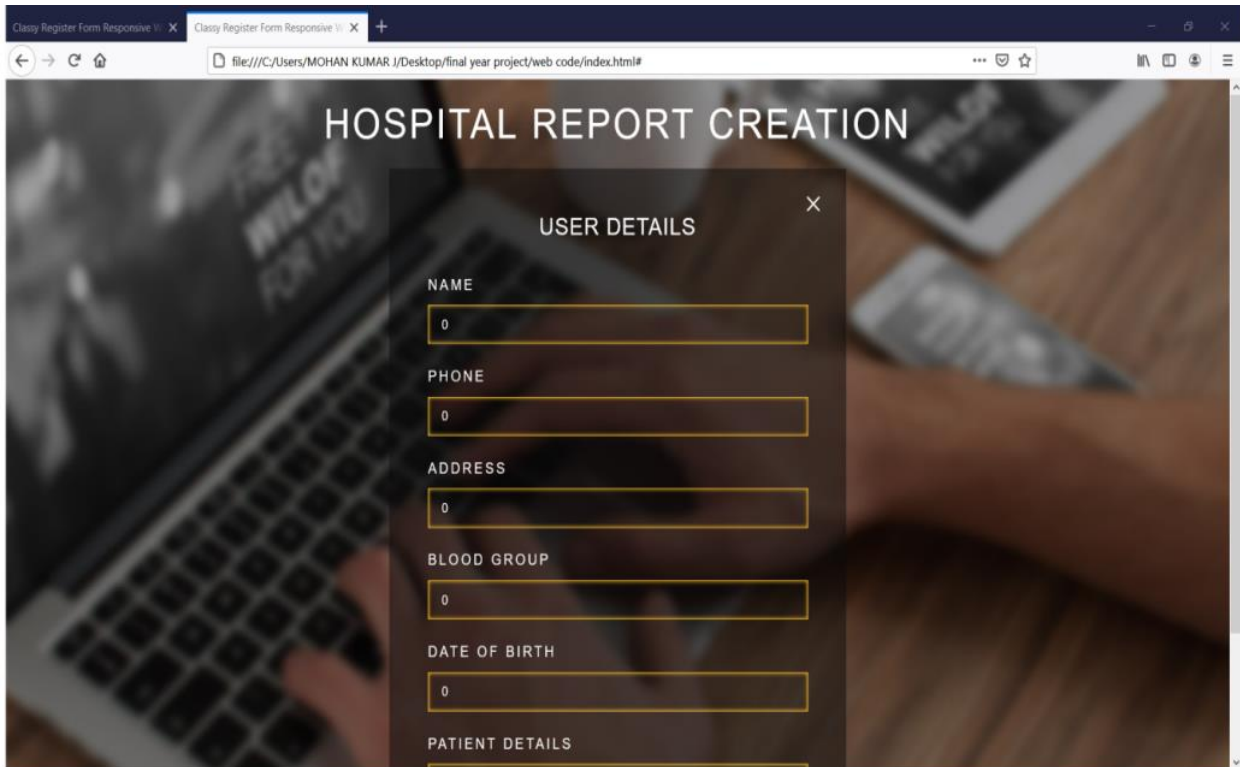
Fig 3: WEBPAGE FOR HOSPITAL

VIII.FINGERPRINT REGISTRATION

With the help of biometric sensor, fingerprints of people are registered to store and access their details from the database.
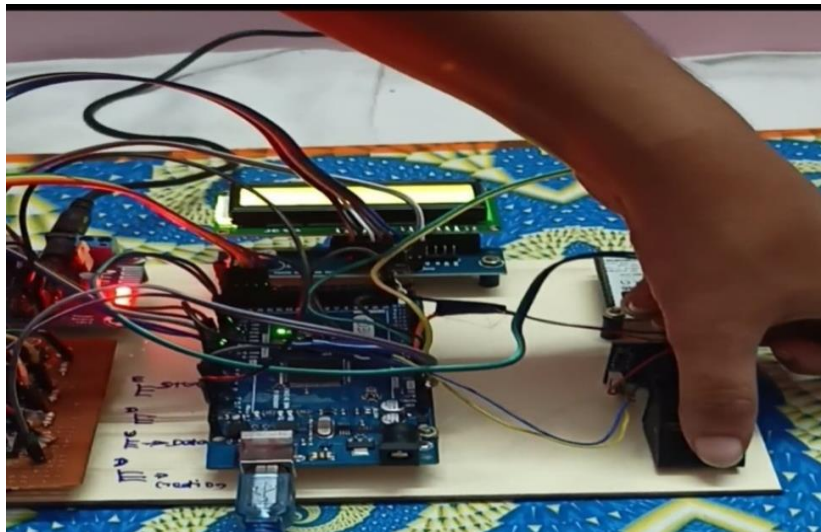

FIG 4: FINGER PRINT REGISTRATION

After registering the fingerprint using biometric sensor, we will collect the details of people's name, address, phone number, blood group, date of birth and these details will be stored in database and it can be accessed during emergency situations using fingerprint.
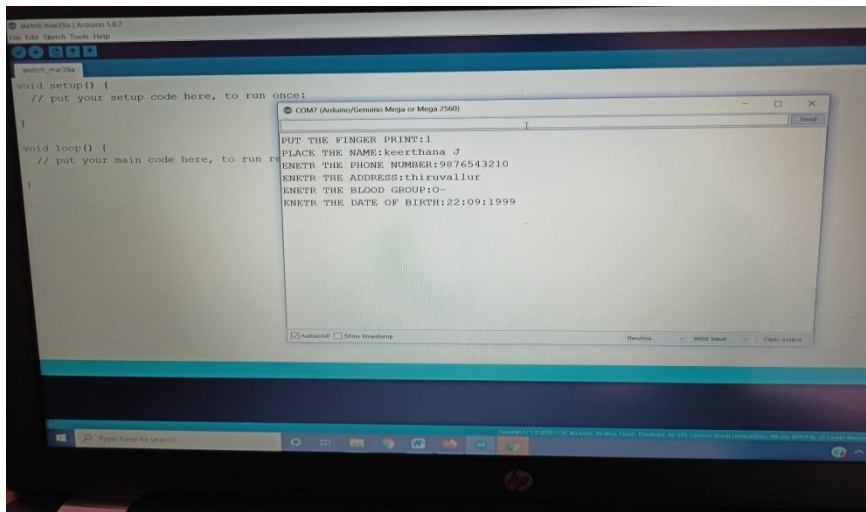
Fig 5: PATIENT'S DETAIL REGISTRATION

IX.OUTPUT

After the accident has occurred,the patient in the ambulance will be monitored by nurse and his/her details will be accesed using fingerprint and then the nurse will update the situation of the accident prone victim into the database.
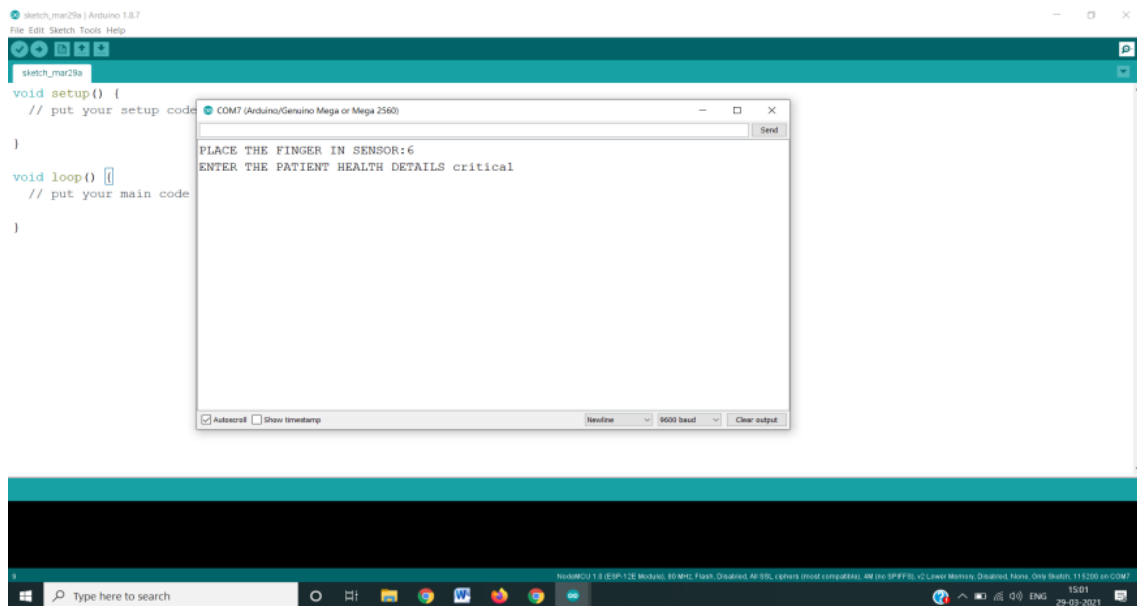

Fig 6: PATIENT'S HEALTH DETAIL

Then the updated health details of the patient from the databse will be shared to the police station.At the police station there will be a buzzer which will notify them to register the case and then it will be updated to the database.
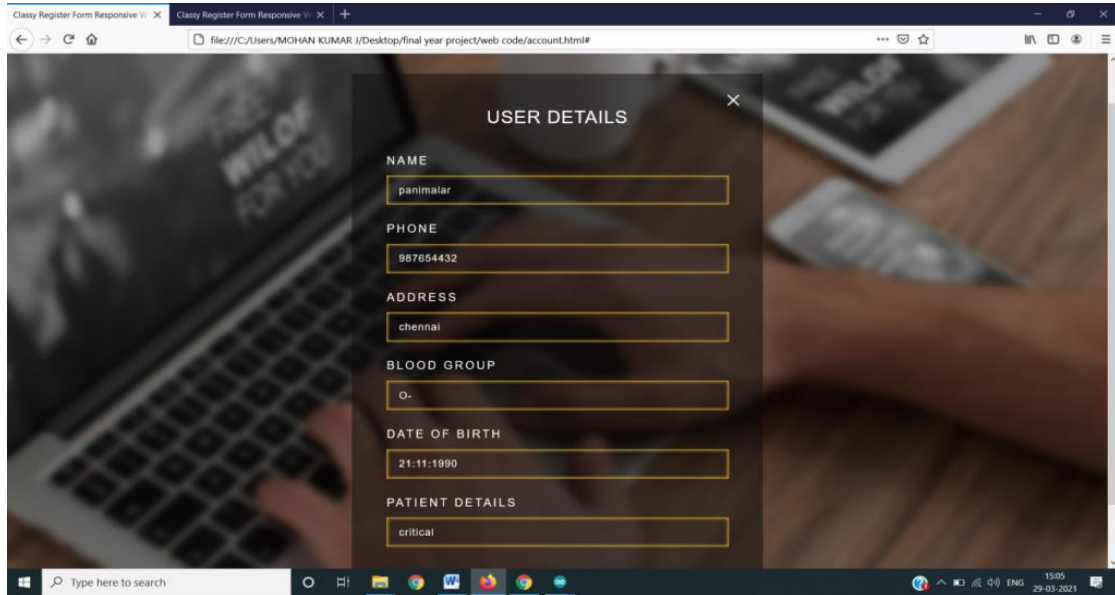
Fig 7: OUTPUT AT POLICE STATION

After the police case registration, the updated details from the database will be sent to the hospital for timely treatment.
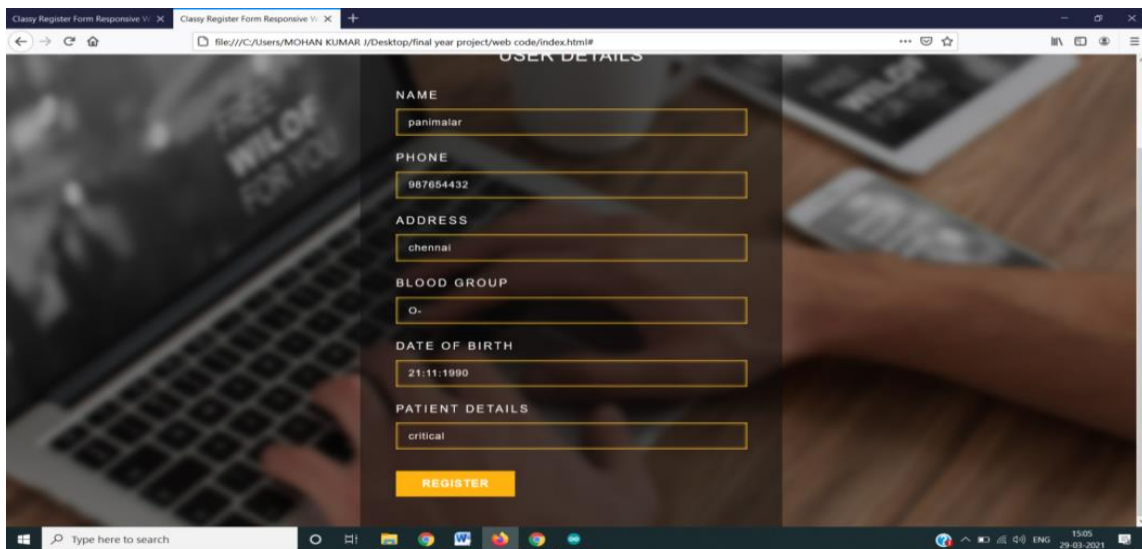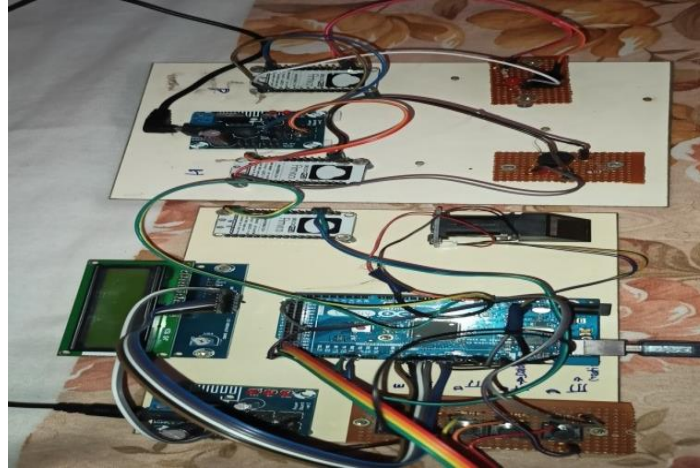

Fig 8: OUTPUT AT HOSPITAL

Fig 9: HARDWAREKIT

X. FUTURE SCOPE

In the near future, we will enhance the system by introducing mobile edge computing to enhance security and privacy. As we are storing our information in the cloud, there will be chances of stealing or misusing the information. So, the system requires a full security and privacy analysis and we intend to address this in future work.

XI. CONCLUSION

The model proposed in this paper, serves timely treatment to the accident prone victims and the details of the patient will be sent to the police station via cloud for case registration before reaching the hospital so that lives of many people can be saved.

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