

# SMART VILLAGE - DIGITAL HEALTHCARE SYSTEM

Dr. J. Arokia Renjit M.E., PhD<sup>1</sup>, Hariharan C<sup>2</sup>, Divin Raj A<sup>3</sup>

<sup>1</sup>Professor/Head, Dept. Of Computer Science and Engineering, Jeppiaar Engineering College, Tamil Nadu, India

<sup>2-3</sup>Student, Dept. Of Computer Science and Engineering, Jeppiaar Engineering College, Tamil Nadu, India

\*\*\*

**Abstract** - Seventy percentage of population lives in rural area and they lack in proper healthcare. This has increased the rate of mortality. In order to overcome this pathetic situation we've designed a Digital healthcare system for the rural community where a doctor is available for each patient 24/7. An android application is created where the patient can login to register their details and when they use the smart IOT device which invokes pulse, temperature, humidity, heartbeat rate. Their current status is sensed and displayed in the normal checkup page which helps the doctor to provide accurate prescription to the patient on-time without in-person visit. This application is user-friendly which helps patient to check out the medicines even during their minor issues and emergency.

**Key Words:** IoT- Internet Of Things, ECG-Electrocardiogram

## 1. INTRODUCTION

Seventy percentages of population lives in the rural areas, the six decades of Indian independence have witnessed too many plans and proposals giving top priority to the health issues in India. Unfortunately, despite huge economic growth, health continues to be the greatest predicament. Especially in rural areas due to lack of quality infrastructure, dearth of qualified medical functionaries and non-access to basic medicine and medical facilities thwarts its reach to 700 million people living in rural areas suffers due to high rate of mortality and deplorable medical facilities. Considering the picture of grim facts there is a dire need of new practices and procedures to ensure that quality and timely healthcare reaches the deprived corners of the Indian villages though a lot of policies and programs are being run by the government but the success and effectiveness of these programs is questionable due to gaps in the implementation. Due to non-accessibility to public health care and low quality of health care services, a majority of Indians turn to the local private health sector as their first choice of care. However, private health care is expensive often unregulated and variable in quality, besides being unreliable for the illustrate, it is also unaffordable by low income rural folks. In order to overcome the lackness of healthcare and decrease the mortality rates in rural areas. Our team has come up with a perfect solution to overcome these hectic situations faced by the people.

## 2. LITERATURE SURVEY

A literature survey is a compilation of connected studies. It gathers data from publications, organizes it, and integrates it into a logical argument. This section will present the findings of a study of researchers' preferences for picking material from cited publications for review, as well as the types of transformations and editing performed on the selected information. Industry and Technology Trends in Digital Healthcare Hyeon Jeong Han Joo Yeoun Lee has mentioned this result and has used it to eliminate or reduce symptoms. Telehealthcare uses ICT technologies to share clinical data between patients and doctors over great distances and deliver medical services. For effective healthcare, this strategy makes use of big data, IoT, and AI. M. Ghosh, D. Halder, and SK A. Hossain presented a health care system for hospital management that allows guardians and doctors to remotely monitor patients' health conditions via the internet. This is the simplest method of monitoring patients' health conditions by sharing health information with health care teams such as doctors, nurses, and specialists. P.Jebane, P.Anusuya, M.Suganya, S.Meena, M.Diana amutha priya's IoT based health monitoring and analyzing system stated that in their project, the module will continuously monitor the data and store it in the cloud, and when any abnormalities in the patient's health occur, it will alert the medical staff. Medical personnel will be able to spend less time manually monitoring patients.

## 3. Solution Proposed

We have proposed a robust health monitoring system that is intelligent enough to automatically monitor the patient using an IoT device health monitoring system that collects status information through these systems, which would include the patient's heart rate, pulse rate, body temperature, humidity temperature, and ECG, and sends data to the patient's doctor with his current status and full medical information. This would allow the doctor to keep track of his patient from anywhere, as well as the patient to provide his health information without having to go to the hospital. The system use smart sensors to collect raw data from each sensor and transfer it to a database server, where the data may be further processed and statistically preserved for use by medical professionals. Maintaining a database server is essential in order to keep track of the patient's previous medical

records, allowing for a more thorough examination. This is being implemented and tested on a patient who has entered their personal information into the web portal. So, after the patient is connected to an IoT device and collected datum will be stored in a firebase database and the medical datum are retrieved by an android application, where the patient and doctor have separate user id so the doctor will assess the particular patient.

#### 4. IMPLEMENTATION

We've collected the medical information of all individuals from a village named Elapakkam Madhuratagam taluk at Chengalpattu district. The collected information is stored in a database for the consultation of doctor. Further when a patient is in emergency situation he uses the sensor so pre collected details and current status of the patient is displayed to doctor so that a perfect prescription is given to patient finally through online mode.

##### 4.1 Architecture diagram

The architecture diagram shows the diagrammatic view of our project Digital Healthcare system. The following architecture diagram will diagrammatically explain the working of our project.

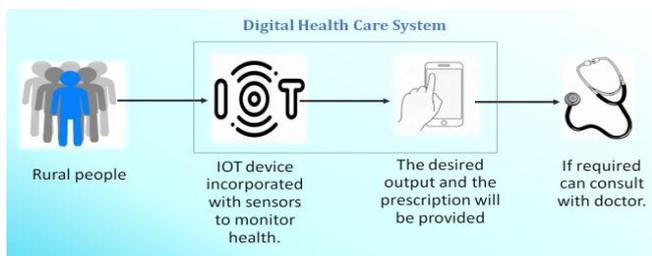


Fig-1: Architecture Diagram

##### 4.2 IoT device

In IoT Device we have used 3 sensors pulse sensor, humidity sensor and ECG sensor. Pulse and humidity sensors connected with node MCU, ECG sensor connected with Arduino UNO, The node MCU is used to store data on cloud and storage device, and Arduino UNO is used to control the overall modules. The Sensors which are used will calculate the value of body temperature, humidity temperature, pulse value, heartbeat rate and ECG level values.

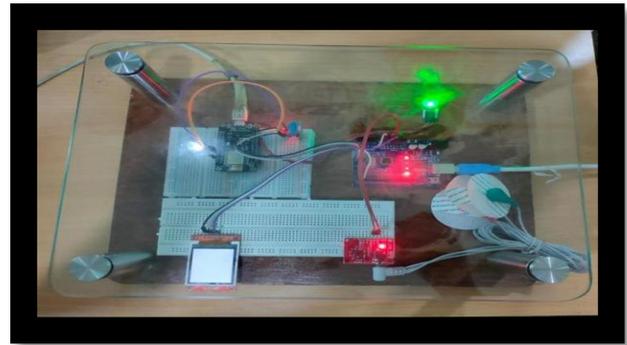


Fig-2: IoT Device

##### 4.3 Mobile Application

We created a mobile application using JAVA in android studio to see the medical results from cloud.



Fig-3: Mobile Application

#### 5. ADVANTAGES

- It is very helpful for the people in rural areas.
- This health monitoring system can be set up in nearby healthcare center. So, whoever need to take health check up can utilize.
- It is cost efficient.
- With the help of this device people in rural areas can take regular health check up, which will be helpful in maintaining their health.
- Any serious health issue can be detected in the early stage itself.
- As this medical information are stored in the database, the people can get the complete information about their health whenever necessary.
- They don't need to go for many miles apart to consult a doctor or to take health check up.
- Helps to maintain the health of the people.

- This will also help us to reduce the death rate of people.

## 6. FUTURE ENHANCEMENT

- Diabetes is currently on the rise in our population and most people travel daily to be tested for it. So, we are going to incorporate the glucose meter in our project.
- In future we are having an idea to add a blood pressure sensor in our project.

## 7. CONCLUSION

Our project which includes Android application and IoT device connects both doctor and patient from rural areas irrespective of miles away just with the readings of the body temperature, humidity temperature, pulse value, heartbeat and ECG levels. This has randomly reduced the cost of travel and saves the travel time for the patient. Even during their emergency situation they can virtually deal with doctor 24/7. This made people to be aware even during their minor issues by taking medicines at earlier stage through doctor's prescription so they'll never think about skipping the medicines or treatment even during mild issue. In case of major crisis they can reach out to doctor virtually for the prescription. Hence this could reduce the rate of mortality in rural people.

## REFERENCES

- [1] Remote Health Monitoring System using IoT," M. Ghosh, D. Halder, and SK A. Hossain, 2016 5th International Conference on Informatics, Electronics, and Vision (ICIEV).<https://ieeexplore.ieee.org/document/7760135>
- [2] Electronics and Communication Engineering, Fatima Michael College of Engineering and Technology, Madurai, India, P.Jebane, P.Anusuya, M.Suganya, S.Meena, M.Diana amutha priya <https://www.trendytechjournals.com/files/issue5/volume5/issue4-1n.pdf>
- [3] Saranya. E, Maheswaran. T, "IoT Based Disease Prediction and Diagnosis System for Healthcare", International Journal of Engineering Development and Research (IJEDR) | Volume 7, Issue 2 | ISSN: 2321-9939, pp.232-237, 2019[https://www.ejmcm.com/article\\_6279\\_51d459f50975217796e03c4d54bc2e0e.pdf](https://www.ejmcm.com/article_6279_51d459f50975217796e03c4d54bc2e0e.pdf)
- [4] Reference Architectures for the Internet of Things," by Michael Weyric and Christof Ebert, IEEE Software, vol. 33, pp. 112-116, December

2015.

<https://ieeexplore.ieee.org/document/7367994>

- [5] International Journal of Research in Advent Technology (IJRAT) Special Issue E-ISSN: 2321-9637. [http://www.ijrat.org/downloads/Conference\\_Proceedings/NCRITSI-2K19/NCRITSI2K19-28.pdf](http://www.ijrat.org/downloads/Conference_Proceedings/NCRITSI-2K19/NCRITSI2K19-28.pdf)