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# *Survey on Improvement of Health Care system using Internet of Things in Rural Areas*

***Esther Grace M***
*Student*
*Department of Computer Science and Engineering*
*Easwari Engineering College Tamil Nadu, Chennai*
***Corresponding Authors' email id**: chinnu.grace18@gmail.com*

***Abstract***

*The health care services using IoT can be extended to the next level by implementing it in the Rural Areas where even the basic medical facilities are denied. IoT, its perspectives, its role in the Health Care services, implementation, applications and the challenges faced are explored in a depth. The advancements in IoT based health care systems and the ideas for taking it to the next stage, in such that, the humanity gets benefited .Telemedicine is also used in Monitoring Patients health through Video call instead of meeting the Doctor in Person. Till now, there is no standard of compatibility for the tagging and monitoring equipment's. Continues Monitoring of the Sensor Devices by the primary user and providing more sensors & providing more settings applications so that person can have more user friendly environment and will be able to do more task automatically rather than manually. In Rural Area's the Patients details and general check up is carried out and the data of the Patient is stored in the cloud and a sensors embedded in Bangles/Bracelet which is used to monitor the the health conditions of the Patients like Heartbeat, Pulse etc are provided to the Patient. If there is a variation in the Heartbeat, Pulse and excessive sweating which is diagnosed as Heart Attack then the Primary user monitoring the Patients details immediately sends the SMS alert to the Ambulance driver near by the Patients place whose details and Registered mobile number are stored in the cloud .The Ambulance driver*

*immediately reaches the Patients place and takes the Patient to the Hospital for further Treatment.*

***Keywords:*** *IoT, Telemedicine, Sensors, Primary user, Cloud.*

## I. INTRODUCTION

The term Internet of Things (IOT) has been around for quite a few years. It is gaining ground with the evolution of advanced wireless technology. The basic idea of this concept is the presence of a variety of objects – such as RFID, NFC, sensors, actuators, mobile phones. In this IOT technology, the RFID is the most important concept and it is necessary for internet of things. Different technologies in market like RFID, machine to machine communication, vehicle to vehicle communication etc are implemented using IOT. The main problem of IOT is facing scenario of security the potential Hackers who always eager to attack. The ability to code and track objects has allowed companies to become more efficient, speed up processes, reduce error, prevent theft, and incorporate complex and flexible organizational systems through IOT. The ―Internet of Things‖ refers to the coding and networking of everyday objects and things to render them individually machine-readable and traceable on the Internet Much existing content in the Internet of Things has been created through coded RFID tags.

## IOT ELEMENTS

### *1. Sensing*

The first step in IOT workflow is gathering information at a ―point of activity.‖ This can be information captured by an appliance, a wearable device, a wall mounted control or any number of commonly found devices. The sensing can be biometric, biological, environmental, visual or audible (or all the above). The unique thing in the context of IOT is that the device doing the sensing is not one that typically gathered information in this way. Sensing technology specific to this purpose is required.

### *2. Communication*

This is where things start to get interesting. Many of the new IOT devices we are seeing today are not designed for optimal communication with cloud services. IOT devices require a means for transmitting the information sensed at the device level to a Cloud-based service for subsequent processing. This is where the great value

inherent in IOT is created. This requires either W iFi (wireless LAN based communications) or WAN (wide area network… i.e. cellular) communications.

***3. Cloud Based Capture***

Gathered data is transmitted to a cloud based service where the information coming in from the IOT device is aggregated with other cloud based data to provide useful information for the end user. The data being consolidated can be information from other internet sources as well as from others subscribing with similar IOT devices.

***4. Delivery of Information***

The last step is delivery of useful information to the end user. That may be a consumer, a commercial or an industrial user. It may also be another device in the M2M work flow. The goal in a consumer use case is to provide the information in as simple and transparent a method as possible.

***Cloud Computing:***

The cloud is commonly used to refer to several servers connected to the internet that can be leased as part of a software or application service. Cloud-based services can include web hosting, data hosting and sharing, and software or application use.

_The cloud‘ can also refer to cloud computing, where several servers are linked together to share the load. This means that instead of using one single powerful machine, complex processes can be distributed across multiple smaller computers. A cloud server is a shared section of a server. It‘s allocated for your use (via a virtual environment) and controlled by the service or cloud provider. On your end, it appears that you are running your own compute and storage space. However—and this is an important point—there are usually a large number of other people using the same compute and storage resources within their own virtualized environment. Cloud servers offer you the ability to save on purchasing and management costs that would otherwise go to developing and maintaining your own infrastructure. Additionally, with cloud storage, you get billed for only the amount of storage you use, which means you can increase your compute and storage services and scale as needed. One of the advantages of cloud storage is that there are many distributed resources acting as one – often called federated storage clouds. This makes the cloud very tolerant of faults, due to the distribution of data. Use of the cloud tends to reduce the creation of different versions

of files, due to shared access to documents, files and data.

**RELATED WORK**

[1].Doctors was able to access the medical history of the patient and start treatment remotely. There are lots of remote villages where people are relaying on medical facilities far away from their living places. These situations need to be changed by giving proper facilities as well as education on existing systems to the people living in the remote villages, so that they will be able to utilize them effectively.

[2]..But for remote health monitoring applications, the delay caused by transferring data to the cloud and back to the application is unacceptable. Remote patient health monitoring in smart homes by using the conceptof fog computing at the smart gateway are used where advanced techniques and services such as embedded data mining, distributed storage, and notification services at the edge of the Network are used in order to stop the delay of transferring data from and back to the cloud.

[3].Practical Privacy preserving protection analytics in developing health care system . A kHealth - a personalized digital healthcare information system s being developed and tested for disease monitoring. We can analyze the data and analytic requirements for the involved parties, identify the privacy assets, analyze existing privacy substrates, and discuss the potential tradeoff among privacy, efficiency, and model quality. IOT Devices and Cloud is used to collect and analyze the Personal Health data in depth and provide early diagnose diseases, personalized Treatment and Health Care.

[4].Medical Records in Hospital Information Based System obtained from different Devices cannot be used for further analyzing and Decision supporting are collected in a weak content.IOT based Medical Records are used in linking them with Knowledge of the Link Open Data where a Testing is conducted in the Medical Records in Hospital Information based system and Results are concluded that the information in information based system are enriched and useful in analysis and Decision Making.

[5].IOT based Health care system Implementation uses Hidden Markov Model (HMM) and ElectroCardioGram (ECG) senors.It aims to improve the Monitoring and timely intervention of Cardio Vascular Diseases patients and

enhancing Medical services for those Patients. Patient path estimator , patient table and alert management within the hospital faclicitate timely intervention for the treatment for Cardio Vascular Diseases Patients.

[6].An Algorithm called Load Balancing Algorithm is used for IOT Communication algorithm within the E-Health Environment. It is a self organized and adaptive algorithm by taking into account the changes occurred within the Network, on the link situation and within the object Parameter. After the implementation and evaluation of algorithm the obtained results are better QoS and Efficient.

[7].A Novel Trust based Decision Making Protocol is uses Trust Based information in sharing among the Health IOT Devices so that Knowledge can be built to rate the Environment at a particular location and time.This Knowledge would built the IOT Devices to act on behalf of the User to decide whether or not it should visit the place for health Reasons.trust-based health IoT protocol considers risk classification,reliability trust, and loss of health probability as three design dimensions for decision making.

[8].A Pathology Monitoring and Detection of people is done using IOT Cloud. The proposed system is used in Monitoring a local framework Binary pattern on Mel-spectrum of voice signal and machine learning classifier to detect the pathology.Monitoring Framework can achieve high accuracy of Detection and easy to use.

[9].A Novel signalquality-aware Internet of Things (IoT)-enabled electrocardiogram(ECG) telemetry system for continuous cardiac health monitoring applications. The proposed framework is tested and validated using the ECG signals taken from the and Physionet challenge databases and the real-time recorded ECG signals under different physical activities.Results show that the proposed SQA method (automated signal quality assessment) achieves promising results in identifying the unacceptable quality of ECG signals and outperforms existing methods based on the morphological and RR interval features and machine learning approaches..

[10].Chikungunya is a mosquito instinctive disease which spreads in various parts of the country.A Novel Paradigm to Control the Chickungunya Virus is used where it uses Wireless

Communication Technology.It includes the interconnected apps, objects (devices & People), communication technologies, tracking system and patients‘ knowledge base. where data are collected from the sensors, objects and cloud to take the preventive actions by healthcare professionals. Precautionary measures will be taken by collecting the information about causes of growth of mosquitoes. The suitability of the approach is validated at the base layer of IoT and data is transmitted to the cloud with the help of edge nodes. to implement the smart health system and can be beneficial to take the preventive measures before the severe spreading of Chickngunya .

[11]. IoT based e-healthcare telemedicine system for detection and estimation of general health profile of a patient. It is based on a remote e-health telemedicine system consisting of a portable sensing unit comprising of Pulse Oximeter, ECG, EMG, GSR, body temperature and blood pressure that is assigned with the work of various medical data along with images of eye, tongue and area of impact of the patient‘s body, sampling rate specified for the parameters. The unit enables a video communication between a patient and medical practitioner and also has the features of storing and processing the sensed data locally for storage and diagnosis of the patient. The system is capable of working in both online and offline modes so that it can be used efficiently in limited Internet connected areas.

[12].A Affordable Kit equipped with sensors that will be used to take a patient‘s vital signs, such as blood pressure, heart rate, and blood oxygen saturation. Telemedicine device would replace the medical checkup. Instead of traveling all the way to a hospital to have checkup the patients would measure their vital signs with our device, and send them to a physician for review to determine whether an in-person appointment is necessary. Our vital sign kit is compact and also easy to use. an average, the pulse oximeter and heart rate sensor had less than 10% error compared to commercial products. our sensor development by wirelessly sending data results from the vital sign kit, the first essential part of a treatment can be carried out via wireless communication, saving the doctor and patient time and money.

[13] Telemedicine is widely used in developing countries for its variety of health services. A developed a low cost portable telemedicine tool kit for remote diagnosis of patients. successfully it can

collect patient data from any remote locations by using its developed tool kit. seven vital signs of patient's data such as blood pressure, pulse and oxygen in blood, blood glucose level, patient position and falls, body temperature, electrical and muscular functions of the heart through ECG and airflow: breathing through the device in an automated manner are collected. The developed device is portable and can be used easily with any telemedicine model. An developed android app for collecting the patient data from the device, controlling the device and sending data to the server for telemedicine application. Fially a developed portable telemedicine tool kit can be an useful and integrated component of any telemedicine model which will assist the researchers for their applications.

## CONCLUSION

Thus Improvement in the Health care system in Rural areas are being much benefitted for people in the interior of the Villages. People can have easy approach to the nearby Hospitals during Emergency. Loss of Life can be prevented by Timely Monitoring of the Patients using Sensors.

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