DEVELOPMENT IN EMERGENCY HEALTH SERVICES FOR RURAL AREAS IN INDIA

PROF. K.T. JADHAO[1], MS. CHETNA KAMATH[2], MR.BHAVIK ADEP[3],
MR.ABHISHEK SAWANT[4], MS. MANISHA ANDADE[5].

[1]Assistant Professor, Dept of Electronics & Telecommunication, AlamuriRatnamala Institute Of Engineering & Technology , Asangaon, Maharashtra,India,

[2,3,4,5] UG Students,Deptof Electronics & Telecommunication,AlamuriRatnamala Institute Of Engineering & Technology , Asangaon, Maharashtra., India,

Abstract: The Internet of Things (IoT) make smart objects the important building blocks in the development of emergency health care system. The IoT has various application domains and E-health-care is one of them. The IoT revolution is designing a modern emergency health care system with promising technological, economic, and social prospects. This paper surveys about developing an IoT based modern Emergency health care system. IoT technology has made a tremendous improvement in E-health care domain using its hardware like highly advanced sensors in collaboration with the cloud computing. But there is also a need of developing a proper well-organised system which could serve the society during the time of emergency health problems. So the proposed model is an IoT based system developed using embedded system hardware and cloud computing. The system is fully decentralized or distributed network controlled by the main server. Another dimension to the system is making people available the information regarding new health related scheme put forth by the government. The system is particular designed keeping into consideration the emergency health problem in rural areas but it is also applicable in urban areas with few hardware changes.

Index Terms: IoT, Server, decentralized or distributed network, emergency health care system.

I. INTRODUCTION

Rural residents often experience barriers to healthcare that limit their ability to obtain the care they need. In order for rural residents to have sufficient healthcare access, necessary and appropriate services must be available and obtainable in a timely manner. Even when an adequate supply of healthcare services exists in the community, there are other factors to consider in terms of healthcare access. For instance, to have good healthcare access, a rural resident must also have: Financial means to pay for services such as health insurance coverage that is accepted by the provider ,Means to reach and use services such as transportation to services which may be located at a distance and the ability to take paid time off of work to use such services,Confidence in their ability to communicate with healthcare providers particularly if the patient has poor health literacy,Confidence in their ability to use services without compromising privacy,Confidence in the quality of the care that they will receive. In this paper, rural and urban areas are interconnected by a Health Distributed server i.e. a particular area is divided into a group of few houses. Also, all the hospitals are interconnected as per the allotted priority level based on the facilities available in the hospital. The group can be called as cell and each cell is connected to the main Distributed server using embedded system and networking devices, which are located in one of the highest priority level hospital of the city.

Another dimension to this project is providing information of new schemes / programmes such as vaccinations, eye camps, and health care for infants, senior citizens, pregnant women, etc. to each and every house in a cell through the available database stored in the server by using mobile application.

II.PROPOSED METHOD

Problem definition

Healthcare is a foremost requirement for the citizenry of every nation, unfortunately, when it comes to medical services, particularly in rural areas, several countries including India lag considerably. Providing quality healthcare to rural populations is a vital, but highly overlooked issue in the developing world. India, the world's most populous democracy, has struggled with establishing Emergency Medical Service (EMS) for all sections of society. Fortunately, in recent years, the emergency medical service scenario in urban India has undergone a major transformation and there are now innumerable hospitals, responsive ambulance services, and improved medical facilities available in metropolitan India. When it comes to healthcare in rural India however, there remain considerable challenges to setting up robust emergency medical services. With more than 70% of the country's population living in rural areas, the lack of access to these basic facilities have proven to be disastrous. The main challenges to the rural healthcare sector are low quality of care, poor accountability, lack of awareness, limited access to facilities, limited manpower, and reluctant community participation.

Limited information regarding emergency medical services leads to multiple issues, as people are unaware on what course of action to take when confronted with the inevitable. There is a lack of proper system for emergency health services such as improper transportation services, delay in communicating with the hospitals in urban areas, network issues, unawareness among people, cost etc. All these problems lead to increase in death rate in rural area.

This project examines this issues related to the emergency and other health services in rural areas. There is lack of quality emergency and other health services in rural areas of India. The topic selected for the study is " Development in the emergency health services in rural areas of India " The main theme of the project is creating a proper well-defined system based on a well-known technology named " Internet of Things" where a proper communication would be created

between rural and urban by interconnecting them using internet..

III. SYSTEM ARCHITECTURE

Architecture includes all important sections required to design a new emergency health care system particularly for rural. A proper implementation is essential to provide a reliable system to meet the requirements of the rural areas.

The whole system is a decentralized network, categorized into four main section-:

• **Home node-** The section has a group of few houses in a villages which are located at a near distance from each other .Here more than one group can be considered, each and every house is provided with a switch. This home node is connected to Hub node and the communication is unidirectional.

• **Hub node-** The section consist of Controller which will interface the

home node with main server and will also store the details of the home node. This hub node is again connected to main server.

• **Main Server-** It performs all the important work of maintaining the database of home node, ambulance and hospitals.The main server is located at government hospital of a City which is interconnected with all other private hospitals in the particular city where required facilities including doctors are available. The main server is also interconnected to the hospitals. In the other city where required facilities are available. These prevent unnecessary delay in the treatment of the patient by providing it a proper hospital on time. In this way main server makes all the required decisions .A proper acknowledge Process is also followed in order to prevent

BLOCK DIAGRAM
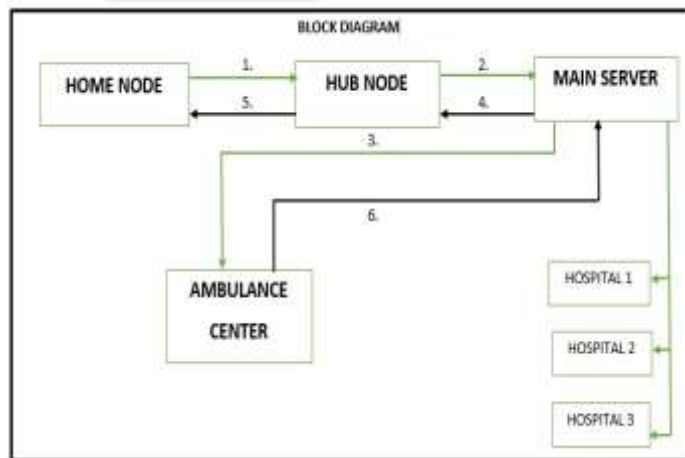
miscommunication .This server is not a centralised server similarly other server can be created in different cities.

• **Ambulance services-** Ambulance service works in co-ordination with main server .It cannot take its own decisions it should work on the instruction of the main server. The working is as follow, it will go the village where the emergency aid is required. The ambulance has a doctor who can provide primary treatment to the patient on ambulance itself ,once the ambulance takes the patient the doctor identifies the type of emergency for egg: pregnancy, heart attack, accident etc. accordingly it will press the switch available in the ambulance simultaneously message will be send to the server and the server will provide the required Hospital's address, if in case the city doesn't contain the necessary hospital required for the treatment of the patient ,he will be immediately taken to the other

city as per the instruction provided by the server on the basis of availability.In the architecture there is bidirectional connection between Homenode and Hub node, Hub node and Main server, Main server and Ambulance center. When it comes to real time application the whole system will require satellite communication

Another dimension to this paper is providing information of new schemes / programmessuch as vaccinations, eye camps, and health care for infants, senior citizens, pregnant women, etc. to each and every house in a cell through the available database stored in the server by using mobile application.

IV. FLOW CHART

Description:

Step1: Keeping into consideration the literacy of the people in the rural areas, these system is design. So home node is provided with switch, which is meant to be pressed in case of any emergency. This node is situated in one of the rural area, when the switch is pressed the home node communicates with server in which, it transmits the information regarding the node to the server.

Step2: Home node communicates with the server via Hub node. Hub node act as an interface between home node and server. Whenever the switch is pressed in the home node the message is transmitted to the hub node via the transceiver called ZigBee and hub node transmits the message to the server using GSM module Simultaneously the server acknowledges the home node and smart ambulance as well.

Step3: After the server acknowledges the home node as mention above, it also acknowledges the ambulance by sending the address of the home node where it has to reach. Ones the smart ambulance reaches the particular node, the doctor available in the ambulance provide the primary treatment to the patient and re-acknowledge the server by sending the message regarding the type of emergency.

Step4: Accordingly the server checks for the required hospital available in the area, and acknowledges it. Later the specific hospital re-acknowledges the server in "Y" or "N" as per the facilities available in the hospital.
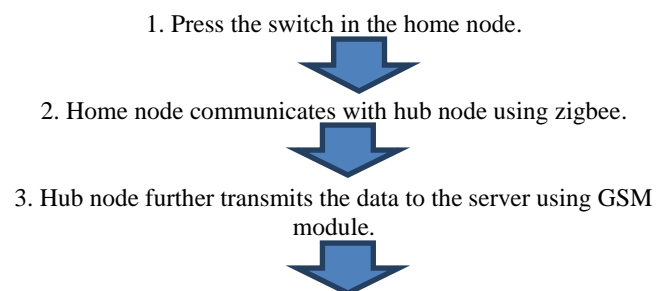
Step5: If yes, the server acknowledges by sending the address of the hospital to the ambulance.

Step6: Finally the ambulance takes the emergency patient to the particular hospital informed by the server.

Step7: And the whole system is again reset by pressing a switch in the ambulance

Step 8: The other dimension to the project is to broadcast the people in the rural area regarding the schemes put forth by the government.

FLOW CHART

1. Press the switch in the home node.

2. Home node communicates with hub node using zigbee.

3. Hub node further transmits the data to the server using GSM module.

4. Server acknowledges home node and simultaneously communicate with smart ambulance.

5. Ambulance acknowledges the server simultaneously server checks the required hospital.

6. Hospital acknowledges server "Y" or "N" as per the available facilities.

7. Server Re-acknowledges the ambulance regarding the suitable hospital.

8. Ambulance reaches the hospital.

9. Finally the system is reset by ambulance.

10. Other dimension to the paper is broadcast of the message to the rural area regarding the new schemes put forth by the government.

V. CONCLUSION

The designed system provides an advance, well maintained, and monitored emergency health services for rural areas of India. The purpose of this paper is to create an emergency health care system, particularly for rural areas in order to serve them a proper emergency health related facilities. Keeping into consideration the parameters such as literacy of the people and population in a particular area, the paper focuses to make available all medical facilities that includes emergency aid, information of new health related activities / schemes

Put forth by the government to the entire rural population easily by interconnecting among rural, semi-rural and urban areas.

The whole idea of this paper / Backbone of the paper is a well-known technology named INTERNET OF THINGS in short IoT TECHNOLOGY.

VI. REFERENCES

1. National Council of Applied Economic Research, New Delhi, India
2. Smart India Hackathon
3. Rural Internet India connectivity
4. IEEE papers on public health problems in India
5. Internet of Things Technologies for HealthCare

Third International Conference, HealthyIoT 2016, Västerås, Sweden, October 18-19, 2016, Revised Selected Papers
6. Internet of Things (IoT) Technologies for HealthCare

4th International Conference, HealthyIoT 2017, Angers, France, October 24-25, 2017, Proceedings
7. Industrial IoT Technologies and Applications

International Conference, Industrial IoT 2016, GuangZhou, China, March 25-26, 2016, Revised Selected Papers
8. Cloud Infrastructures, Services, and IoT Systems for Smart Cities

Second EAI International Conference, IISSC 2017 and CN4IoT 2017, Brindisi, Italy, April 20–21, 2017, Proceedings

VII. WEBSITES

1. https://www.nextbigwhat.com/rural-india-internet-connectivity-297/
2. https://www.quora.com/How-many-villages-in-India-has-no-internet-access
3. https://internetofthingsagenda.techtarget.com/definition/IoMT-Internet-of-Medical-Things
4. https://en.wikipedia.org/wiki/Health_information_technology
5. https://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT