A Radio Network to Observer Machines Used Extensively for ILL-Ones

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Abstract:- **The Bottom Station system is designed to get and provide the data sent in the User Nodes to some nearby hospital's patient monitoring computer via a WIFI connection. There's little existing technology allowing hospitals to watch DME-dependent patients without needing the current infrastructure, like the land lines, the cell towers, Ethernet cable or even the Internet. Electricity-operated durable medical equipment (DME), for example ventilators, and patient monitoring products, are existence-supporting machines used extensively by patients in your own home. While convenient and economical, use at home of DME is prone to power outages, particularly the ones brought on by disasters that frequently exist in large area as well as for a lengthy duration. Reported here in is really a novel wireless system that employees an invisible random network to automatically report the patient's information and placement, and the DME information and standing to some nearby hospital when power outage is detected. This technique includes a double edged sword: hospital-based receiving device, known as the bottom Station node, and multiple transmitting products, known as User Nodes, each connected to the DME at patients' homes. The Bottom Station and User Nodes is each constructed with an ARM microcontroller. Furthermore, each User Node consists of a standing Brought and a battery connected with a charge controller. User Nodes are designed and monitor the DME status using WIFI, Transmit the information and relay information towards the Base Station with the radio random network the nodes form in the case of the power outage. This technique works without depending on the infrastructure, and enables hospital staff to understand the information and locations of DME as well as their customers and provide help needed during power outages.**

*Keywords:-***Ad hoc Network, DME, Durable Medical Equipment, WIFI, GSM.**

I. INTRODUCTION

At-use at home ode isn't just convenient and economical, but additionally leads to higher quality of existence for that patient. Despite aforementioned benefits, at-home DME are susceptible to power outages, especially individuals caused by natural disasters. During difficult occasions such as this, the DME dependent patients needed to face the existence-threatening situation because their machines had stopped functioning. Durable medical equipment (DME) is any medical device used in your own home by patients for monitoring and/or dealing with illnesses [1]. There are two kinds of DME: passive equipment and active equipment, the second dependent on electricity to function. Existence-supporting active DME include dialysis machines, ventilators, oxygen concentrators, etc. [2]. While most at-home DME are outfitted with integrated batteries to keep them functioning during power outages, their rechargeable batteries typically last only one hour with lead-acidity batteries and2-3 hrs with more recent lithium-ion batteries [4]. Thus, there's critical requirement for a method of communication between the medical staff in a hospital and patients in your own home during natural disasters without requiring current infrastructure such as landlines or cell towers which are frequently not available during disasters. Conscious of the seriousness of this issue, the Assistant Secretary for Readiness and Response (ASPR) of the U.S. Department of Health & Human Services through its partner. Although there are many in a commercial sense available general-purpose trackers or locators, and a few DME even have integrated confirming models, none of those are operable when the infrastructure is disabled, simply because they all depend around the mobile phone services and/or Internet connectivity. Hence, there needs to be consider a way of communication, which doesn't use the current infrastructure, between your at-home DME-dependent patients and also the hospital staff during disasters. Reported here in is really a novel DME monitoring system employing a radio ad hoc network for transmitting data.

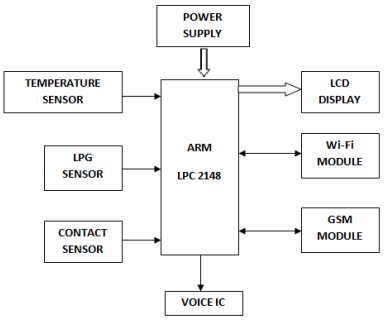

Fig1: Block Diagram Representation

II. MATERIALS AND METHODS

A. Materials: The development board was purchased from SAMSUNG. Other parts and tools were acquired from Manufacturers. The components namely used are Temperature Identification, Contact sensor, Smoke Detection Sensor along VariouRadioShack and Home Depot.
B. Engineering goal: To resolve the communication issue once the infrastructure is disabled which help DME-dependent patients, it had been proposed to engineer a manuscript DME monitoring and confirming system based on wireless nodes with radios following a WIFI (IEEE802.11 standard) specifications [1], operating at the frequency gang of 2.4 GHz and consuming little power, though transmitting at short distances and also at low data rates [3]. This technique would include a double edged sword: multiple transmitting products situated in patients' homes and connected to patients' DME, known as User Nodes, for gathering relevant live data to become moved towards the hospital and something central receiving device situated inside a local hospital, known as the Base Station, for collecting the individual and DME information sent by the consumer Nodes. The machine might have a modular design and scalable implementation, supplying versatility for further optimizations. Whenever a break of AC power supply is detected in a certain location, the consumer node would send information for the Base Station within the hospital. The information includes patient information, GSM location from the patient and DME, and also the power outage status [4]. All patient data and information could be encoded with symmetric-key encryption to ensure that just the administering hospital could receive and decrypt the data in compliance of the HIPAA laws and regulations [2].To really make it broadly available to a healthcare facility and also to the patient, the monitoring system could be affordable to produce and maintain, also incurring no fee every month connected with the mobile phone services.

C. Hardware Design and Set up: The suggested hardware took its origin from the Teensy® version 3.1 Development board, getting an LPC2148 a 32-bitmicroprocessor according to ARM 7 and 256KB of flash storage and 64KB of RAM. This board has 2 standard asynchronous serial ports (protocol: 8 data bits, 1 stop bit and no parity), additionally to some USB programming ports capable of transmitting data in 9600 Baud increments. These serial ports were used to talk with radio stations, receive GSM information and retrieve information in the DME. This board was selected because of its easiness of prototyping and relatively inexpensive. Furthermore, it's voice with the language that was accustomed to program all User Nodes and the Base Station [5].

III. CONCLUSION

Even though the maximum radio range for that current pilot prototype was discovered to be 90 m, the advantage of modular design enables this proof-of-concept system to become easily scalable simply by employing more powerful radio modules or getting specifically placed forwarding nodes to facilitate the forwarding of knowledge from more distant homes. Inside a medium patient density situation, for instance, an invisible by having an indirect (i.e. non line-of-sight) range of>4.70 km might be employed. Given testing data, it had been discovered that the prototype style of the DME monitoring system was achievable to apply and would meet the requirement of safely transmitting patient data, location information, and also the status of DME to some nearby hospital during power outages. Furthermore, the implementation of the DME monitoring product is relatively inexpensive, utilizing in a commercial sense available low cost general-purpose microcontrollers and general-purpose radios. When created in a single circuit in mass production, the price will be even decreased. This novel DME monitoring system supplies a critical link between the DME-dependent patients and also the hospital during natural disasters. Further research and optimization of this system is going ahead.

IV. RESULTS

The paper purely discussed about the three sensors smoke, temperature and contact sensors are attached to Liquid Gas Devices, AC'S and Doors. The input from temperature sensor and other sensors sent to LPC2148 is read and then compared with the threshold values to take future action in case of threshold levels exceeds Then the message will be sent to Mobile phone through GSM and WIFI With the help of Application Software's that are available in Android Operating Systems like Telnet. The Display Indications like "High temperature" "SMOKE ON" "Door Open Status" The Information received by smart mobile which is present with the old people and at the same time particular message will displayed on LCD and announced by voice IC.

Fig2: Hardware Implementation

The figure3 shows the message received by the caregiver by the GSM.

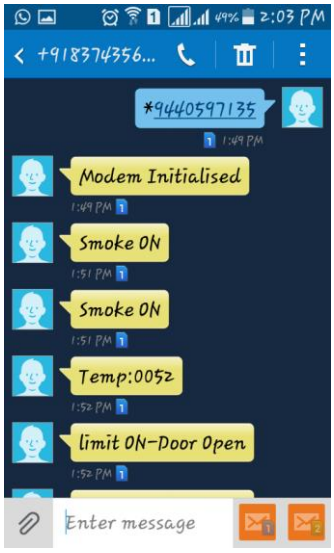

Fig3: Message received by GSM

The fig4 shows the message received by Wi-Fi with the help of telnet app.

Fig4: Message received by Wi-Fi

V. REFERENCES

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