

# SMART HEALTH MONITORING SYSTEM USING GSM TECHNOLOGY FOR PREGNANT LADY

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**ABSTRACT**—This paper deals with design and developed for remote patient monitoring system for pregnant ladies. In this interface health monitoring system would allow a pregnant women's in many areas to interact with a Doctor/ Physician with almost full functional capability. Illiteracy in women and lack of access to health facilities in many areas increases the risk of death for child-bearing women. Preventive measures by constant health monitoring of patient at early stages and guidance to prevent costly hospitalization to avoid such risks is the main objective of the project. The health monitoring device suggested in this project constantly measures the Body temperature and Heart Beat of a Pregnant Lady and whenever there are fluctuations from the normal value it sends the information to her gynecologist at remote place in her mobile. Also this device allows the user to hear the advices and diet prescriptions as advised by the doctor. Also in this proposed system IOT (Internet of things) has been implemented, where IoT is a key and its related technology plays a dynamic role in pregnant women care taking inside hospital and outside. IoT ensure the effective and efficient care of pregnant women in any environment .The usage of these advanced technologies in pregnant women care environment, absolutely eradicates the pregnancy complications and harmful incidents

**Index Terms**—Pregnant lady, blood pressure, Heart beat, Temperature, Sensors, IOT, SST.

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## I. INTRODUCTION

This paper presents a prototype machine-to-machine (M2M) healthcare solution that combines mobile and IPv6 techniques in a wireless sensor network to monitor the health condition of patients and provide a wide range of effective, comprehensive, and convenient healthcare services. A low-power embedded wearable sensor measures the health parameters dynamically, and is connected, according to the concept of IPv6 over low-power wireless personal area network, to the M2M node for wireless transmission through the internet or external IP-enabled networks via the M2M gateway. A visualization module of the server program graphically displays the recorded biomedical signals on Android mobile devices used by patients and doctors at the end of the networks in real-time. Our approach for a global M2M healthcare solution is managed to process the large amount of biomedical signals through the extended network combining IPv6 technique and mobile technology for daily lifestyle to users appropriately.

This paper presents a working model which incorporates sensors to measure all these parameters like body temperature and Heart Beat rate and transfer it to the ARM 11 SMARTPHONE, so that the patient condition can be analyzed to by doctors in any part of the hospital wherever they are. Thus it reduces doctors work load and also gives more accurate results, wherever there is an abnormality felt by the patient, we have also incorporated saline monitoring system which gives an alarm when the saline bottle about to empty. The experimental setup can be operated for monitoring from anywhere covered by the Cellular (GSM) service by exchanging SMS messages with the remote mobile device. At the consultation unit, a dedicated application software is required to manage the follow of SMS messages from the mobile and display the temperature and heart beat of the patient.

## II. SYSTEM COMPONENTS

### a. Hardware components

This section discusses the basic theory of components used for this work.

- Microcontroller – SST(silicon storage technology)
- Heart Beat sensor
- Temperature sensor
- LCD - 16 x 2
- Rs232 - MAX232
- GSM Modem [RS232 based]
- 7812/ 7805 voltage regulators for power supply
- Power supply circuit

### b. SOFTWARE USED

- Embedded C
- Keil-c compiler
- Flash magic burner software

## III. LITERATURE SURVEY

[1] In 2013 Media Aminian and Hamid Reza Naji worked on “A Hospital Healthcare Monitoring System Using Wireless Sensor Networks. In a hospital health care monitoring system it is necessary to constantly monitor the patient’s physiological parameters. This paper presents a monitoring system that has the capability to monitor physiological parameters from multiple patient bodies. In the proposed system, a coordinator node has attached on patient body to collect all the signals from the wireless sensors and sends them to the base station. The attached sensors on patient’s body form a wireless body sensor network (WBSN) and they are able to sense the heart rate, Temperature and so on. This system has limited range under which it can send the data to the base station so this device is only applicable in hospitals.

[2] In 2012 Darwish A, Hassanien AE Wearable and Implantable Wireless Sensor Network Solutions for Healthcare Monitoring Sensors. WBANs applications in the medical field are composed of wearable and implantable sensors that can detect information from the human body and send it to a central unit. These sensors have some characteristics such as small, low-power detection and have the capability to detect medical signals data from the control unit. There is a difficulty in the monitoring devices that are not completely wearable where the wires are used to

connect many sensors. Yuce explored a vision to the future of medical sensor networks should be miniaturized and also wearable sensors that can communicate with the receiving device wirelessly.

## IV. GAPS IN THE LITERATURE

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## V. SYSTEM DESIGN AND IMPLEMENTATION

This section will discuss the design procedure and the real time implementation of the system. The working principle of the smart health monitoring device for pregnant ladies is visually explained in the schematic block diagram shown in Figure.1. Block consists of heart rate sensor, blood pressure sensor and temperature sensor. the transmitter part is based on silicon storage technology and GSM used for sending the patient report to nearest available doctor. The report of patient mainly consist of heart rate, BP, and temperature. Heart Rate Ranges from 60 to 100 beats per minute blood pressure is expressed in two numbers, such as 120/80, and is measured in millimeters, A normal body temperature is usually referred to as an oral temperature of 98.6 °F (37 °C),. If rate is less than 50, or more than 90, and if BP and temperature is more/less than given parameter then it will be indicate with the LED & Alarm, and that report will be sent to the doctor as well to guardians. The doctor will study the report and send the required prescription through transceiver IOT to patient.

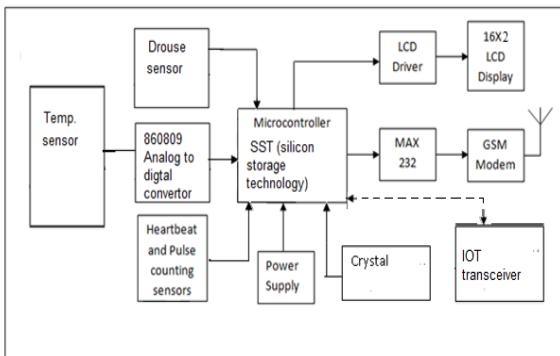


Figure.1 : Complete Block diagram of smart health monitoring device

## VI. PROCEDURAL FLOW

The control module offers a series of flow to determine various conditions of operation. Below is a summarized flowchart of the module

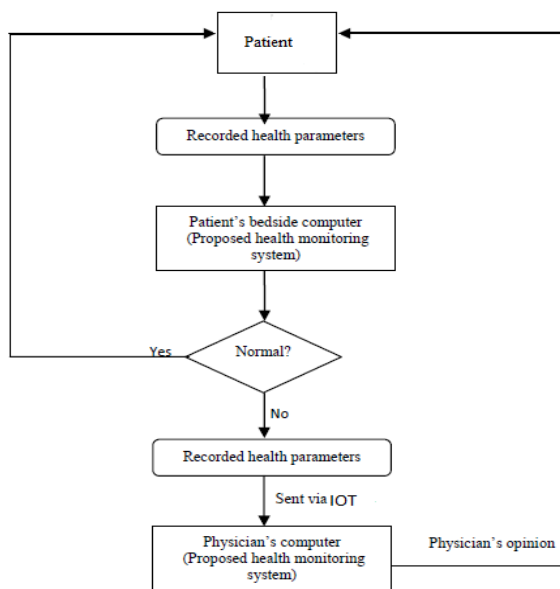


Figure.2: Health monitoring workflow

## VII. APPLICATIONS

- 1) Hospitals
- 2) Remote heart rate monitoring applications
- 3) Local monitoring applications

## VIII. Advantages

- 1) Ease of operation
- 2) Low maintenance cost

- 3) Fit and forget system
- 4) No wastage of time
- 5) Durability

## IX. CONCLUSIONS

It can be concluded that the sole aim of carrying out the design, analysis and implementation of a smart health monitoring device to help pregnant ladies was achieved, in that the aim was to develop a cheap, affordable, reliable and efficient smart health monitoring system, which was successfully realized at the end of the design process. The whole concept of the system cuts across the hardware implementation and software implementation. The module generated an output that is report of the patient and sent to her Gynecologist as well to her guardians, if report shows any abnormality then immediately guardian will request for the ambulance by giving her exact location taken through GPS to the ambulance and request them to admit her in the nearest hospital. Suppose if there will be minor change in report then doctor will send advice through IOT to the patient. So this device effectively helps the pregnant lady to avoid miscarriage and take healthy diet as suggested by doctor so that she can give a birth to healthy baby.

## X. REFERENCES

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