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An Efficient Method to Monitor the Health of Pregnant Women Using Iot

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ABSTRACT: There are severalgroups of human resources in country like India at rural areas than cities. These people can't concern about their health due to unavailability of hospitals near them. If these people got injured, they need to travel for a long distance to reach the hospital. So, they avoid visiting medical centresto check their health conditions regularly. These may cause mainly maternal women to do monthly check-ups. It makes them to affect severe causes because of improper treatment which also affects the infant. To overcome these issues the present research work is implemented, to monitor the health of the maternal women regularly using Internet of Things (IoT) with some hardware like Arduino, sensors, etc. It carries the presenthealth condition data over internet or Bluetooth to the knowledge of the doctors to monitor their health and provide proper health diet to the patients from their places using IoT.

Keywords: Maternal women; Health monitor system, Arduino kit, Sensors, Internet of Things (IoT).

1. INTRODUCTION

It is the accountability of independent population to affordgrub, instruction, proper health concern to the general public of that nation regularly. Because fulfilling these things will leads the country's development.According to the present scenario, World Health Organization releases the data that around 287000 maternal women died worldwide due to improper medication.Taking care of maternal women may lead to avoid the death of pregnant women's and keep monitoring the health of the fetus regularly. But, due to improper knowledge of medication, people failed to provide proper health diet to the maternal women.To overcome all these issues, the technology has used to keep monitoring the maternal lady as well as their fetus healthier. The pregnant women need to take ultra-scan test twice during their pregnancy to know the growth of the fetus. Proper and timely check-up may help the pregnant women to have the safe delivery. But the availability of the hospitals near them and the cost of travelling are not affordable to them. So, they avoid visiting the health centers properly. Therefore, from the vital parameter like heartbeat of the fetus and body temperature of the pregnant women are monitored using sensors and Internet of Things has used for measuring and transferring the data to the doctors for providing proper

medication from their respective places. The people from the rural area no need to travel for the long distance for their check-ups.

2. LITERATURE SURVEY

Jundong Lee, et. al. [1],describesthat the intend and performancecomponentof Iotwearable ECG with the smart phone for the observing of health. In this IOT system smart shirt are established with ECG sensors and can be worn by any type of patient for monitoring patient health in real time and get essential prescription or treatment. The disadvantage of the structure is that it only focuses on superior people.

Neethu Rachel Jacob et.al.,[2] suggests the image-based system which acquires the ECG signal via digital camera; this information is performed on the like MATLAB and data sending through the internet network and stored in database. Then the original picture is then availed to the user via Android smart phones. The purpose of this organization is the necessary signs and limitations from the ICU monitoring system and makes this data to be available to the doctor who may not be in the hospital and in the country. Unfortunately of any abnormality, the doctor is informed by directing aannouncement from C2DM server to her/his portable. The drawback of this paper is that, due to the slow internet connection the data will not be send to the doctor which is located remotely. The image is captured through the camera, which must be HD which cost a lot.

Jonathan Woodbridgeet.al., [3]hasimplemented wireless healthcare by sensor communication, data processing, data visualization etc on different mobile platforms. There is central controller for wireless health application. They developed libraries for particular mobile devices to implement the health care on different platforms. CDMA and UTMS have more network then Bluetooth and Wi-Fi, and all this cellular connectivity is supported by mobile platforms. They started by, assessing the best smart phone platform for the health care, next they determine the runtime environment to the smart phone platform and finally they developed the wireless health application for that particular platform. They provide different and better debugging environment for different platforms. The drawback of this paper is that they do not represent the complete wireless heath software library.

Aminian et.al.[4] states that, there is continuous observation of the patient's physiological parameter such as blood pressure of uncomplaining as well as heart rate. This framework is essentially significant for pregnant ladies to evaluatethe assortment of parameters like blood pressure, heart beat and fatal movement to control the medical problem.This system has to monitoring more than one patient at a time and easily able to sense the BP and heartbeat of the patients. In this scheme, there is a sensor node attached to body of patient to measure signals from the remote sensors and imparts these signals to the database.

This scheme can sense the irregularbody conditions of the patient, climb an alert to the tolerant and sends a Electronic Mail/Message to the consultant for treatment. The majorbenefit of the system is thatincrease the sovereignty for the enhancing pregnant women'svalue of life. The failing of this scheme is that in this the patients need to get admitted in the hospital for continuous monitoring of the patient physiological parameters. This WSN gets complicated if number of patients is admitted in the hospital beyond the specified limit.

Chopadeet.al [5]makes reference to that, the patient screens their wellbeing which might be physical or mental, through the cell phones and gives additional data like area of patient and give the security and dependability. To keep up the security, they utilize a Wireless Technology called as NFC (Near Field Communication Technology for the Future) which

associates with the electromagnetic radio fields. NFC technology is utilized to get to the patient data, and this data is put away in emergency clinic EMR Database.

3. SYSTEM COMPONENT

Basic theory of components used in this proposed research work have been discussed here.

- Arduino board
- Micro- Controller
- Heart beat sensor
- RS232- MAX 232
- WIFI Module
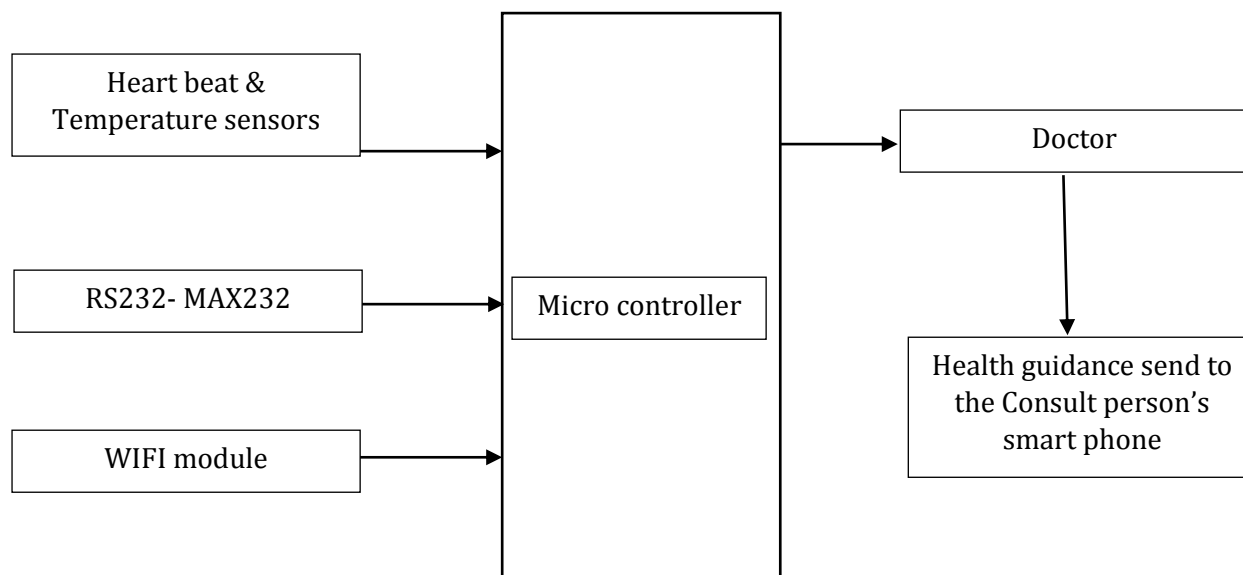- Power adapter

System design and implementation:

Fig: 1 Block diagram to monitor the health of pregnant women using IoT

- **Micro controller:**

GivenPIC Micro - controller is suitable to use for flexible to program. The microcontroller has summation integer of 33pins and 40pins for put in and use for amount produced. The outstanding sevenpins are worn forthe stage-manage kit, the master pin and after all ground pin. The EEPROM is alsohaving that ismakes it attainabletowards accumulate a quantity of dataimperishablysimilarthe receiver codes and the transmitter code frequencies.The EEPROM is low cost and the advantage is it be able to be rewrite as many times with the useof the FLASH memory technique in it. The use of the 20pin controller can prefer what kind of claim should be acknowledged as a message to the tool by reception confident input from the sensor. The sensor is in contact with water.

- **RS232:**

  The RS232 chip is a micro-controller. This micro controller chip is used to take a decision what type of communicationwants to theconvey toend handler's smart handset. This micro-controller will be determined by transfer the improvedstandards

as the output from specified sensors. RS232fix what categoryof communicationdesire can be send for the all values are received from the given sensors. Afterwardgetting the values, it permitsGSM modem to send the data to the check withhuman being.

- **Heart beat & temperature sensor:**
  The fetal heart rate is measured using heartbeat sensoralong with Arduino kit. The signals from the electrodes using an instrumentation amplifier and then filter the signals to the required band. The output signal is given as input to the Arduinoitexceeds a particular threshold. Pulse rate sensor is used for maternal pulse rate measurement. This is also given as input to the Arduino. Temperature sensorLM35 are used to measure the heat and cold temperatures of the maternal women and convey the information to the Arduino kit and transfer the details to the carrying person of the women with the reference of the doctor.

- **WIFI Module:**
  WIFI module can be used to transfer the data of the maternal women to the consult person through internet with the knowledge of doctors. It transfers the details about the patient to registered smart phone through IoT cloud storage.

4. ARCHITECTURE

Women in rural areas have very low awareness about theconsequence of appropriatemedicine. Medical charge are also high-priced to them. Therefore, in this structure, various vital parameters like heartbeat, temperature is measured.

The future scheme is designed with the alert system to the doctors about the patient health using the sensors. It comforts to become details regarding health stipulation of pregnant women in pastoral area thus provided that manageable portable health care for pregnant ladies system that helps in appropriate judgment at primary stage of pregnancy thus it helps in tumbling the fetal and the maternity mortality rate.
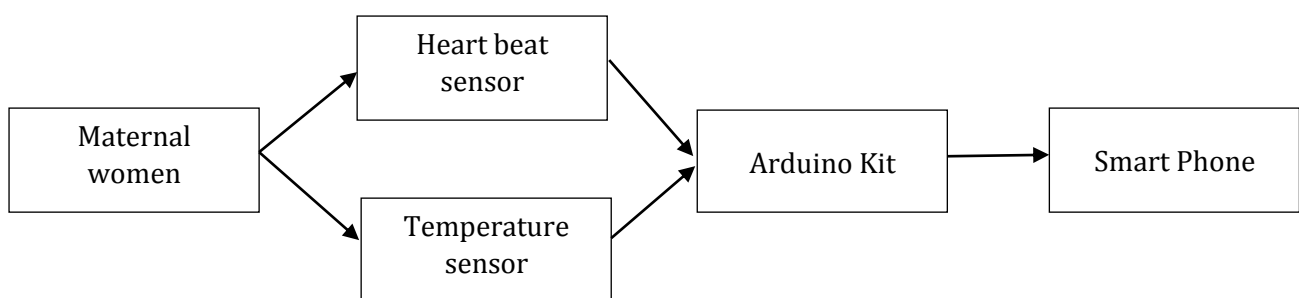

Fig 2. The proposed system of Block Diagram
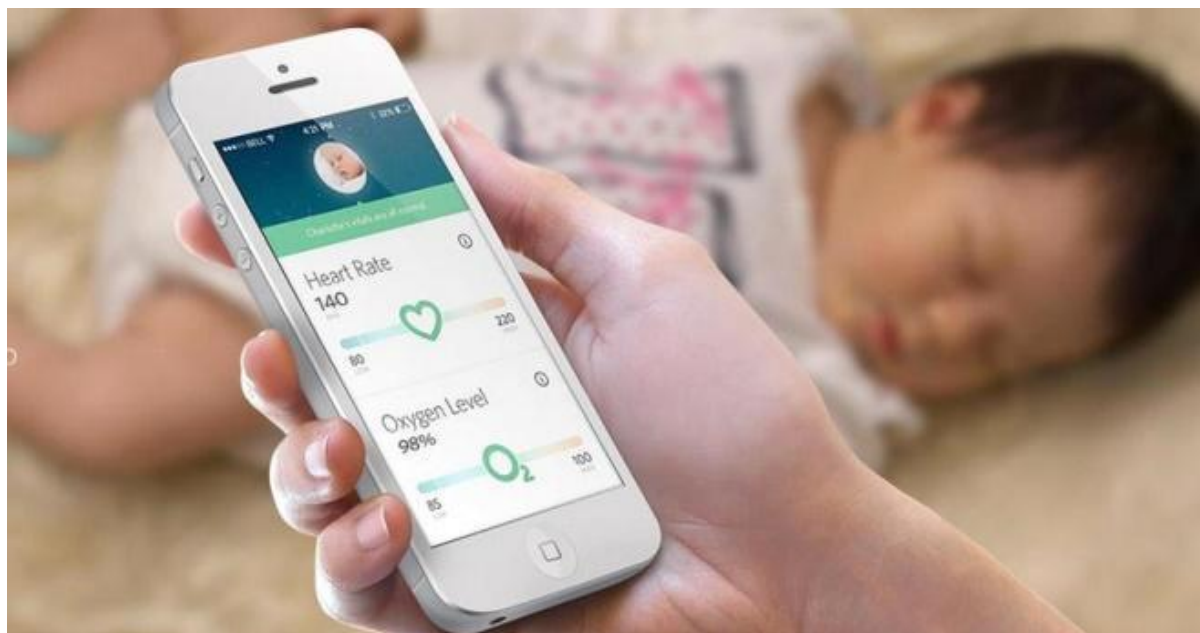
4.1 FETUS HEARTBEAT MONITORING:

Fig 3. The heartbeat sensor is used the fetal heart rate measurement.

The heartbeat sensor is used to find the Fetal heart beatrate. By monitoring and measure theheartbeat rate of the fetus, it helps in tracking the baby growth.

4.2 TEMPERATURE MONITORING:
The given temperature sensor LM35 is used in this system. The above LM35 series temperatureSensors be appropriate to correctness integrated-circuit temperature sensors. The making of the sensor is linearly proportional to theCentigrade temperature.The Temperature sensor is used for temperature measurement of the mother and sends it to Arduino is a microcontroller which will take these signals as inputs and is programmed using Arduino software to get the desired output.16 by 4 LCD displays the output values of these blocks which are given from Arduino.A piezoelectric buzzer gets input from the Arduino and it alarms every time any value The analog output signal from the infection sensor is accompanying to ADC input of the ARM kit. There are 10 ADC Channels in this expansion kit used for the innumerableresolvessimilarhint screen and as a result. This systemwe are exhaustingNetwork zero of the ADC in twelve
-bit mode to quantityinfection as shown in the given block diagram Figure 1. The working of ADC in ARM terminal goes on the subsequent sequence. The mode variation to top quality 10bit/12bit conversion. The networkcollectioncontributionassumed to choiceanticipatednetwork, here it is channel zero.The Subsequentnetworkcollectionanalog MUX associates the nominated networktranslation unit.Then the start of translation (SOC) is given to the ADC.After getting the end of translation (EOC) from the ADC, the digital output data is readout from ADC.Above the all said processes are in I2C protocol. To make the user-friendly flexible development, the above Friendly ARM kit gives to a function "Hardware controller ReadADC( ) "Which takes care of all the actives of ADC affecting to accepting a numerical data of given analog input channel and earnings value of the analog

input. The value returned by the function is a raw digital data of the analog input signal. This value most be standardized.
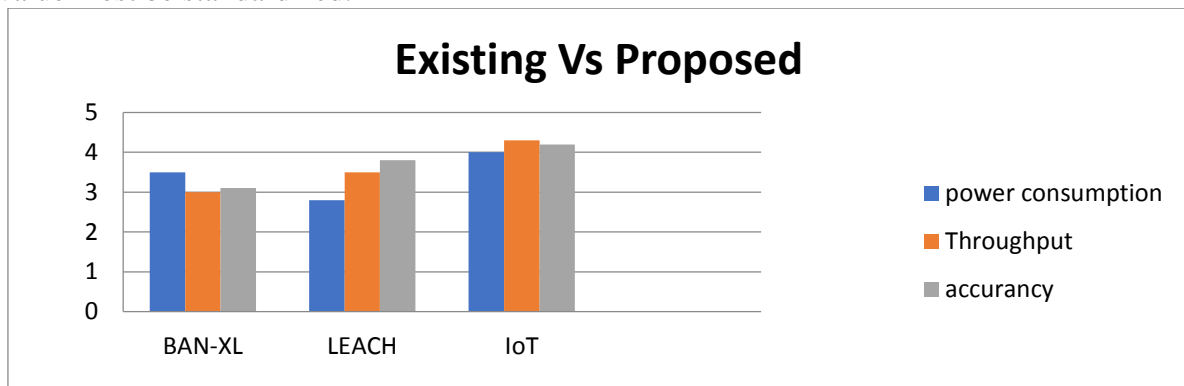

Fig 4 : Comparison chart for existing vs proposed work

Here, the comparison chart shows that, the power consumption, throughput and accuracy results are 85% higher than the existing system. Because, the transmission speed of the data from the sender to the receiver is faster than the BAN-XL and Leach. Among the existing system, they need an individual mobile application to perform the result. But in the proposed research work, there is no need of any application is required. Through SMS all the data can be transferred to the concern person on time.

5. CONCLUSION:

In mobile Application, certaindynamicconstraints for pregnant women like temperature, heartbeat ratesensor are noticed, also it provides notifications to the patients, in the android application.Our structureefforts to deliverexcellence and well-timed health backing for the pregnant women.It supports pregnant ladies to avoid insufficiency and the doctors are able to propose healthy diet to the women from their apartment itself through IoT.

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