HEALTH MONITORING SYSTEM THROUGH WIRELESS COMMUNICATION

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ABSTRACT

In the event of technology and therefore the continuous improvement of people's living normal, individual area unit in pursuit of machine-controlled, intelligent and convenient system to watch the parameters of body device conditions. At present, the laptop/PC is employed because the device terminal for observation the various parameter conditions. The system consists of various sensors like heartbeat, temperature and measuring system. Hence, we are able to simply monitor the human behaviour conditions and can also view the data on laptop/PC through ZigBee technology. Hence, by using this technology we can easily monitor the data from system and we can observe human behaviour condition up to date in real time manner.

Keywords: *Wireless Communication, Heartbeat Sensor, MEMS, Temperature*

I. INTRODUCTION

Smartphones area unit quick growing within the IT market and it's the biggest fantastic of our everyday life. Its strongest strength is in its on-line quality. A smartphone has each basic capabilities as a mobile and intensive skills as an information communicator. A typical mechanical man smartphone is provided with a cellular knowledge network accessible chip, a Wi-Fi adapter, a Bluetooth transmitter and a close to Field Communication (NFC) reader. These technologies will be accessed while notinterfering one another and area unit capable of transmittal demanded knowledge in period. Taking full advantage of a smartphone will be an exciting challenge which will extend its capability on the far side a mobile phone's practicality. In care, patient standing watching is important and wishes to be exhausted timely fashion.

A wireless detector network consists of an oversized variety of distributed nodes. The nodes are designed to be little, cheap and autonomous. Every node consists of a microcontroller, a transceiver, associate energy supply and a detector. The nodes are usually connected in associate ad-hoc arrangement. Wireless detector networks are deployed during a form of application areas, such as atmosphere and surround observation, tending and traffic control. Body space networks may be thought-about as a special variety of wireless detector networks with their own specific necessities. They disagree in nature and necessities from ancient wide area wireless detector networks, with the foremost necessary ones being the exaggerated demand for reliableness, energy potency and quality support.

II. LITERATURE REVIEW

We discuss health observance as a possible application field for wearable sensors. we have a tendency to gift some usage models for health observance and discuss the technical necessities for the health-monitoring system supported wearable and close sensors, that live health-related knowledge in daily environments of the users or patients. The presentation is by no suggests that complete, however it aims to administer a thought of the system-level problems to be thought-about for real applications. The technology during this space is speedily developing, and doubtless we are going to proof emergence of those applications within the coming back years within the market.

This paper proposes new system design for instrumentality operation supported the motion recognition employing a 3-axis acceleration detector. The tiny detector is connected to the radio carpal joint with a band and is worn as a wearable device thus as to not disturb body motion. The motion of the arm is detected by the acceleration detector, and information area unit transmitted to the laptop by Bluetooth signals. It's a good detection vary compared to video ways as a result of the Bluetooth radio system has Omni-directional characteristics. The information area unit analysed employing a displaced person matching technique within the laptop and therefore the templates hold on beforehand area unit compared. Every model information correspond to the instrumentality operation. The IR signal is transmitted supported the results of matching and this signal operates the instrumentality. A TV and light-weight are hand-picked for the system demonstration, and it's confirmed that flip on/off of every piece of apparatus, dynamic channels and volume alternation will be performed through body motion.

In the present system, the RF technology is used to monitor the human's conditions using of different kind of sensors. The system which provides only measuring the conditions of the human's body like body temperature of the person by using Temperature sensor, Heart condition of that person to take heart beat using heart sensor along with weather the person is safely walking or skidding i.e. we are checking tilting actions of that particular person using MEMS sensor, etc. By taking all this information from relevant sensors, the information is directly pass through mobile phone using RF communication. In this system, the main drawback is the range of distance is very less. In this paper we propose the system based on Bluetooth technology. In existing system we are using RF Technology, by using RF module in this project we can't monitor on your mobile phones over long distances, so we are implementing smart idea like ZigBee module in this project which can also works on ZigBee technology and sensor information which is gathering from relevant sensors and transmit this information through PC.

III. HARDWARE DESIGN
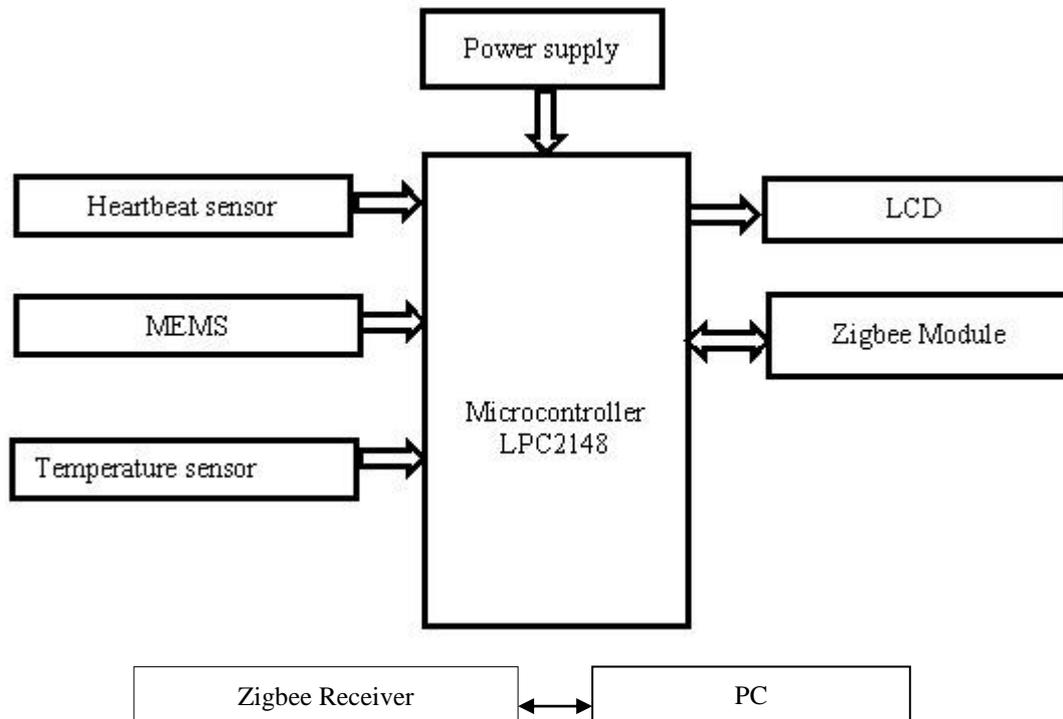
Fig1:Block Diagram of Transmitter and Receiver section.

It is composed of various hardware and software modules. The following block diagram indicates the evaluation of hardware components blanketed in the device.

LPC2148 Microcontroller

The LPC2148 microcontroller board based totally on a sixteen-bit/32-bit ARM7TDMI-S CPU with real-time emulation, sixteen-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package deal, 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory; 128-bit huge interface/accelerator allows high-pace 60 MHz operation, In- system Programming (ISP), unmarried 10-bit DAC affords variable analog output, 32-bit timers/outside event counters (with four capture and 4 examine channels every), PWM unit (six outputs) and watchdog, Low strength actual-Time Clock (RTC), more than one serial interfaces which includes two UARTs , rapid I2C-bus (400kbit/s), SPI and SSP with buffering and variable information length competencies.

Zigbee Module

It's far a wireless community used to perform the action of transfer of data from portion to other portion. It is based totally on IEEE 802.15.four requirements and it's far created by ZIGBEE ALLIANCE. Its switch fee could be very low. It's far used to transfer small information packets. it works on one-of-a-kind topologies, they're i) megastar topology ii) cluster tree topology iii) mesh topology. It makes use of network coordinator, routers and stop gadgets. Especially Zigbee exist in pairs, because whilst one Zigbee is performing as transmitter the opposite will acts as receiver. By method of the use of this Zigbee we can join up to 32 devices. So at that moment one Zigbee acts as transmitter and the ultimate 31 gadgets acts as receiver. When coming to

the frequency band and records transfer velocity, ISM 2.4 GHz worldwide band at statistics transfer speed 250kbps, 868 MHz Band at 20kbps, 915 MHz frequency band is in use at North American at information speed of 40kbps.by the use of this wireless community we will manage the temperature and humidity etc.

Temperature Sensor

Due to the fact we're the use of our temperature sensor on the farm fields we want high correct temperature sensor. We are going for the DS1621 that's actual time sensor. DS1621 can measure temperature form -55oC to +125oC with decision of ½oC. DS1621 temperature sensor is virtual sensor. To talk with the DS1621 we need to comply with I2C protocol. Which takes traces to talk. The two strains are SDA and SCK for information switch and clock respectively. Due to the fact DS1621 is actual time sensor we can get most accurate temperature of the environment. Since we are using virtual sensor instead of analogue sensor we can get accurate price with high resolution. In preference to high and low we will get the temperature cost that's ranging from –55 to +125oC. I2C protocol is referred to as Inter included communication. I2C protocol communicates in synchronous serial verbal exchange. So the facts loss in synchronous verbal exchange is less while in comparison to the Asynchronous conversation.

MEMS

MEMS (MMA7660) is an I2C based accelerometer. The primary motive of the MEMS is to degree the small alternate in movement of MEMS IC in all the x, y and z dimensions. To declare with MEMS MMA7660 IC we need to followsynchronous serial exchange. In I2C protocol we need to state with MEMS accelerometer by way of sending clock in parallel with the information and additionally we acquire an acknowledgement. For the reason that we're the use of synchronous communique, data loss may be very less. There are specially three registers in IC which we've to check in c program language period timings via comparing the unique values we generally recognize the status of persons status.

Fig 2: MEMS sensor module

Heartbeat Sensor

The heart beat detector circuit diagram contains a light-weight detector and a bright red crystal rectifier. The crystal rectifier must be of super bright intensity as a result of most lightweight passes and spreads if a finger placed on the crystal rectifier is detected by the detector. Now, once the centre pumps blood through the blood vessels, the finger becomes slightly a lot of opaque; because of this, less quantity of sunshine reaches from the crystal rectifier to the detector. With each heart pulse generated, the detector signal gets varied. The numerous detector signal is reborn into associate electrical pulse. This electrical signal gets amplified associated triggered through associate electronic equipment which provides an output of +5V logic level signal. The output is additionally directed by a crystal rectifier show that blinks on every heartbeat rate.
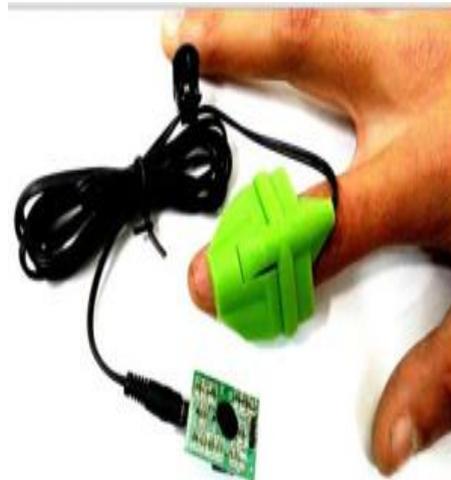
Fig 3: Heartbeat sensor

IV. SOFTWARE DESIGN

In this proposed gadget, as we used LPC2148 we want to use following software equipment to program for it.

1. KeiluVision
2. Flash Magic

The KeiluVision is an IDE for Embedded c language. In this IDE, we want to import the utilities and libraries according to the controller we're the use of. This IDE is very less difficult and in user friendly way to apply. It consists of all the C/C++ compilers, assemblers, and debuggers in it. It simplifies the manner of embedded simulation and trying out in conjunction with Hex file technology.

The flash magic is a programming utility. The C/C++ software written in IDE may be processed into Hex document i.e. in .hex layout. By using hex file we dump the code into microcontroller and perform the task with respective application.

V. WORKING DESCRIPTION

The objective of project is to monitor the human body conditions with respective sensor such as heart beat, temperature and MEMS. We communicate the data through ZigBee-module. Thus we will simply monitor the information from the sensor in a predefined manner. In this project the microcontroller plays a vital role to perform the desired task. The microcontroller we used in this project is ARM 7 LPC2148 which has several inbuilt features such as ADC, SPI, I2C, PWM, and RTC. The sensors which are interfacing directly with microcontroller and we write the code in such manner to communicate with the microcontroller and perform the specific task. The ZigBee module is interfaced with microcontroller which is used to measure the corresponding sensor data and monitor the information in PC.

The following flow chart represents the overall system process steps.
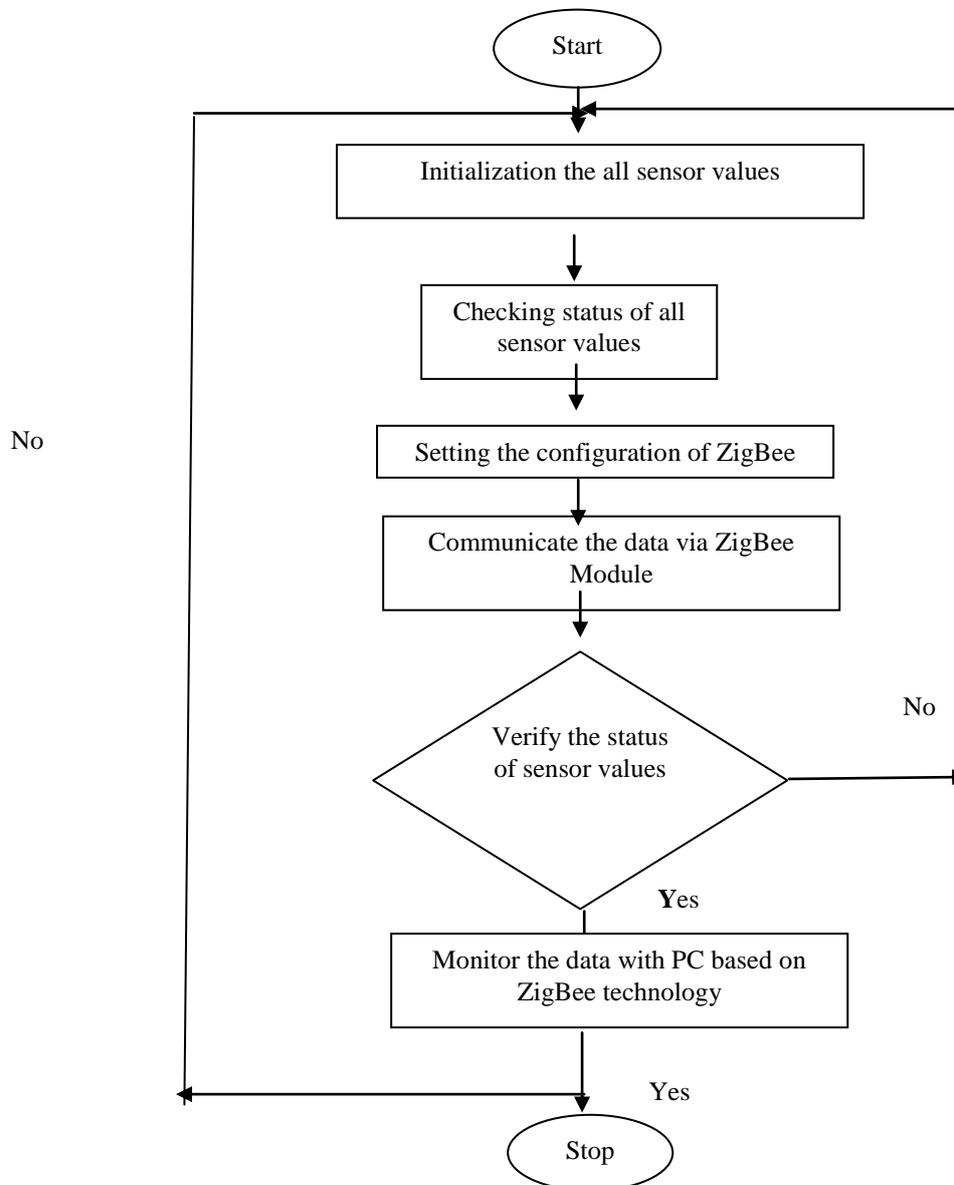
Fig 5: Flow Chart of System Design Process

VI. RESULTS

Finally we can conclude that the systems has been developed in the following different ways

1) We can easily monitor the data from different sensor like heartbeat, temperature and MEMS
2) To monitor the corresponding sensors we preferred ZigBee technology, which is easy to communicate and view the data on PC.

Fig 6: Complete system for smart mobile system.

VII. CONCLUSION

As earlier the system communicate data based on RF Technology which has limited range of communication. As technology grows rapidly, we develop the system based on ZigBee technology which can communicate the data in predefine manner. Hence we can easily monitor the different sensors values like humidity, MEMS and heartbeat. The system can view the data through pc/laptop based on ZigBee technology. By viewing the corresponding sensor data we can easily recognize the human body conditions at required amount of time.

VIII. FUTURE SCOPE

We measure the data of corresponding sensors values. By additionally adding the WIFI module with the place of ZigBee then we continuously monitor the data from corresponding sensors. Hence we can easily monitor the data with respect to sensor values. The Wi-Fi module can generate one unique IP address, by taking the IP address in our mobile phone and accessing the information about the person need to Wi-Fi connection in our smart phones.

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