PATIENT HEALTH MONITORING SYSTEM

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Abstract
Health is the level of useful and metabolic potency of a living organism. In humans, it is the power of people or communities to adapt and self-manage once facing physical, mental, psychological and social changes. The aim of this project is to design and implement a system to measure the Patient Health using the Internet of Things (IoT). The system comprises of various sensors that can sense, compute and interpret data. The heartbeat sense the heartbeat rate of the patients. The heartbeat is measured in beats per minute or bpm. It will check the heartbeat of the patients. Accelerometer sensor is used to measure the moment of the patient. Temperature Sensor is used to monitor the temperature of the patient. With the help of the web hosting the data gets stored in cloud and it can be viewed by anyone whom monitor the patient.

I.INTRODUCTION

In this project a for comma patient a Dynamic Service Non Dependency Verification has been implemented using IOT. The first process of this project initiate with hardware interface. The hardware has been designed using 8051 microprocessors. The microprocessor contains 40 pin. More interactions can be done using 8051 pin interaction. In added with various sensors can be connected through the controller board interface. Multi sensors have been interacted in this hardware. The hardware interactions are follows. Heart beat sensor that Checks heartbeat and Warns if abnormal. Accelerometer Sensor that find fine movements in body. Thermostat Sensor that find body temperature. PIC Microcontroller that is the main interface board. COMM to USB convertor used for System interface.All the above mentioned hardware process has been implemented in a single interface controller board.All the sensors will be wired over the body of the comma patients. The sensors value will be uploaded in a centralized cloud server. A threshold value will be assigned for each sensor. In case of any abnormal means, the warns immediately to the user interface end. Secure Service Virtualization in IoT by Dynamic Service Non Dependency Verification is ensured by the hardware phase initially.

II.EXISTING SYSTEM

Still many researches are undergoing for implementing in Internet of Things (IOT). In major companies the data transmission done manually. Else the process will be done through mail or some other communications. No company has successfully implemented internet of things successfully.

DRAWBACKS OF THE EXISTING SYSTEM

- Still many companies are taking manual reading to know the current status of the machine.
- While taking reading range can be checked manually
- It is a tedious process to take date wise reading from the machines
- Parameter wise reading is not possible.

III.PROPOSEDSYSTEM

The concept of the internet of things, or IOT, is spreading its wings wider and stronger in the current it scenario, and is gradually taking part in every facet of our lives. Look at the way the healthcare industry wants to be connected with each and every thing associated with it.

There is a high level of adoption of medical devices that are connected to each other. In fact, the adoption level shows an increasing trend and there will be more takers for these devices in the future. The tech experts opine that like the internet, the internet of things too is going to be a part of our everyday life. With an increasing number of medical devices getting connected to the internet, the idea of interconnected healthcare sphere gets more fascinating. It is also evident that several software, service, and product companies are showing interest in connecting devices with a view to make their primary product or service more attainable.

The internet of things (IOT) provides the opportunity to enable and extend digital business scenarios, helping you better connect people, processes, devices and other m2m assets, and better harness data across your business and operations. Improving efficiencies, enabling innovation and fuelling transformation are the cornerstones of Microsoft's vision for the digital business. With Microsoft azure IOT services, you can monitor assets to improve efficiencies, drive operational performance to enable innovation, and leverage advanced data analytics to transform your company with new business models and revenue streams.

An IOT device can be tested and diagnosed remotely. For example, a technician can connect from their own office and run diagnostics on an mri that has failed. The technician can pinpoint the problem's root cause and leverage a knowledge management application to find answers to common problems. The technician can also remotely connect to hospital technicians to provide hands-on support. When the root cause is identified, a new part can be shipped with instructions for replacing the defective part—or it can be delivered by a field engineer.

Advantages of proposed system

- Can monitor the patients in remote
- Using Enhanced cryptography, the encryption will process will done before reaching the cloud server.
- Data can be accessed in all types of mobile applications
- No need to configure the cloud environment always, once the configuration done means the connection will get established automatically.

COMPONENTS

HEARTBEAT SENSOR:

Heartbeat sensor provides a simple way to study the function of the heart which can be measured based on the principle of psycho-physiological signal used as a stimulus for the virtual- reality system. The amount of the blood in the finger changes with respect to time.The sensor shines a light lobe (a small very bright LED) through the ear and measures the light that gets transmitted to the Light Dependent Resistor. The amplified signal gets inverted and filtered, in the Circuit. In order to calculate the heart rate based on the blood flow to the fingertip, a heartrate sensor is assembled with the help of LM358 OP-AMP for monitoring.

Fig 3.1Heart Beat Sensor

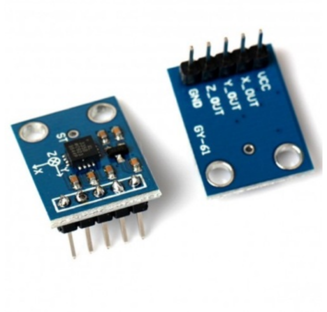
Temperature Sensor

Temperature sensor is a device, to measure the temperature through an electrical signal it requires a thermocouple or RTD (Resistance Temperature Detectors). The thermocouple is prepared by two dissimilar metals which generate the electrical voltage indirectly proportional to change the temperature. The RTD is a *variable resistance*, it will change the electrical resistance indirectly proportional to changes in the temperature in a precise, and nearly linear manner.

Fig 3.2 Temperature Sensor

Accelerometer Sensor

An accelerometer is an electromechanical device that will measure acceleration forces. These forces may be static, like the constant force of gravity pulling at your feet, or they could be dynamic - caused by moving or vibrating the accelerometer. By measuring the amount of static acceleration due to gravity, you can find out the angle the device is tilted at with respect to the earth. By sensing the amount of dynamic acceleration, you can analyze the way the device is moving.



Accelerometer Sensor

POWER SUPPLY

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

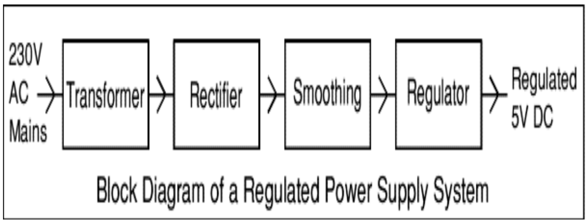
Power supplies for electronic devices can be broadly divided into linear and switching power supplies. The linear supply is a relatively simple design that becomes increasingly bulky and heavy for high current devices; voltage regulation in a linear supply can result in low efficiency. A switched-mode supply of the same rating as a linear supply will be smaller, is usually more efficient, but will be more complex.

Linear Power supply:

An AC powered linear power supply usually uses a transformer to convert the voltage from the wall outlet (mains) to a different, usually a lower voltage. If it is used to produce DC, a rectifier is used. A capacitor is used to smooth the pulsating current from the rectifier. Some small periodic deviations from smooth direct current will remain, which is known as ripple. These pulsations occur at a frequency related to the AC power frequency (for example, a multiple of 50 or 60 Hz).

The voltage produced by an unregulated power supply will vary depending on the load and on variations in the AC supply voltage. For critical electronics applications a linear regulator will be used to stabilize and adjust the voltage. This regulator will also greatly reduce the ripple and noise in the output direct current. Linear regulators often provide current limiting, protecting the power supply and attached circuit from over current.

Adjustable linear power supplies are common laboratory and service shop test equipment, allowing the output voltage to be set over a wide range. For example, a bench power supply used by circuit designers may be adjustable up to 30 volts and up to 5 amperes output. Some can be driven by an external signal, for example, for applications requiring a pulsed output.



Block Diagram of a Regulated Power Supply System

Transformer:

Transformers convert AC electricity from one voltage to another with little loss of power. Transformers work only with AC and this is one of the reasons why mains electricity is AC.

Step-up transformers increase voltage, step-down transformers reduce voltage. Most power supplies use a step-down transformer to reduce the dangerously high mains voltage (230V in UK) to a safer low voltage.

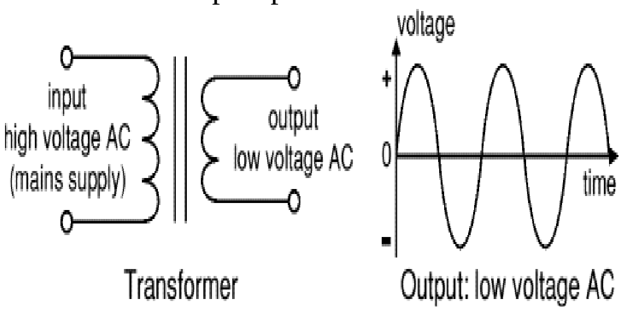
The input coil is called the primary and the output coil is called the secondary. There is no electrical connection between the two coils; instead they are linked by an alternating magnetic field created in the soft-iron core of the transformer. The two lines in the middle of the circuit symbol represent the core.

Transformers waste very little power so the power out is (almost) equal to the power in. Note that as voltage is stepped down current is stepped up.

The ratio of the number of turns on each coil, called the turn's ratio, determines the ratio of the voltages. A step-down transformer has a large number of turns on its primary (input) coil which is connected to the high voltage mains supply, and a small number of turns on its secondary (output) coil to give a low output voltage.

Turns ratio=Vp/Vs=Nn/Ns and Power out=Power in

Vs*Is=Vp * Ip



The low voltage AC output is suitable for lamps, heaters and special AC motors. It is not suitable for electronic circuits unless they include a rectifier and a smoothing capacitor.

LCD DISPLAY

LCD (**liquid crystal display**) is the technology used for **displays** in notebook and other smaller computers. Like light-emitting diode (LED) and gas-plasma technologies, LCDs allow **displays** to be much thinner than cathode ray tube (CRT) technology.

LCD Display

LEVEL CONVERTER

Each level converter has the capability of converting 4 pins on the high side to 4 pins on the low side with two inputs and two outputs provided for each side. The level converter is very easy to use. The board needs to be powered from the two voltages sources (high voltage and low voltage) that your system is using.

Level Converter

IV.IMPLEMENTATION AND RESULTS

LOGIN PAGE

This login page consists of Username and Password to login into the patient record.

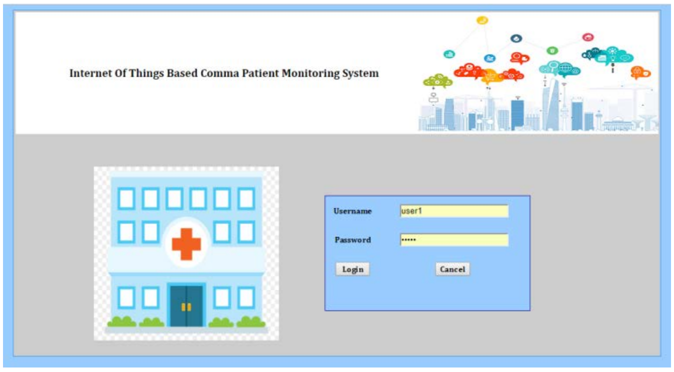


Fig 1. Login Page

HOME PAGE

This home page consists of the parameter details of heartbeat, temperature, accelerometer sensor with date and time.

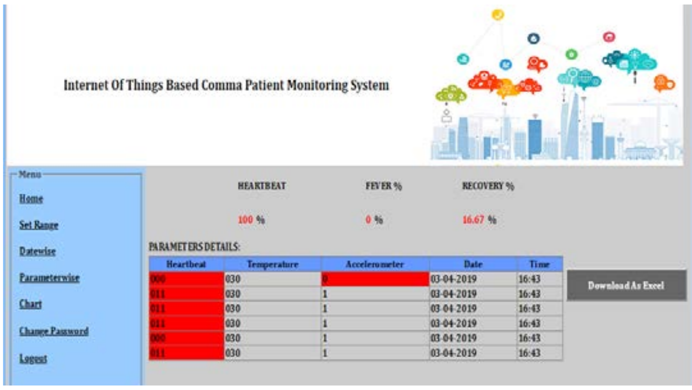


Fig 2. Home Page

SET RANGE

The user can manually set the range of the parameters and it can be viewed.

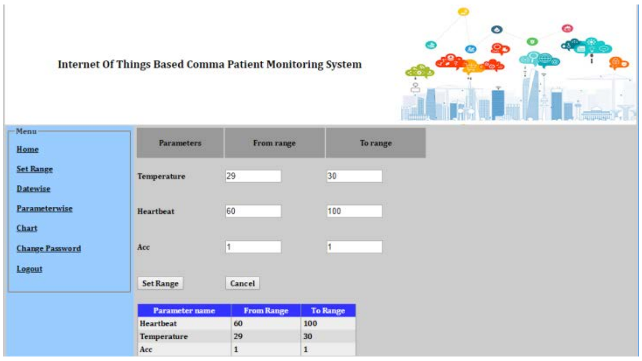


Fig 3. Set Range

DATEWISE PAGE

The patient's data can be monitored date wise.

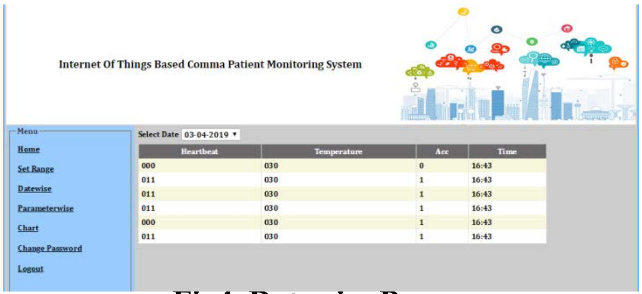


Fig4. Datewise Page

PARAMETERWISE ACCELEROMETER PAGE

The patient data can be viewed by the user by their accelerometer .

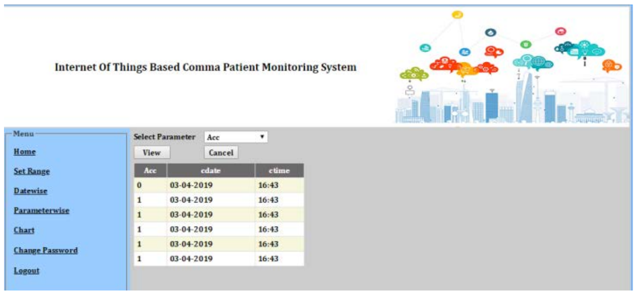


Fig 5. Parameterwise Accelerometer Page

PARAMETER WISE TEMPERATURE PAGE

The patient data can be viewed by the user by their temperature.

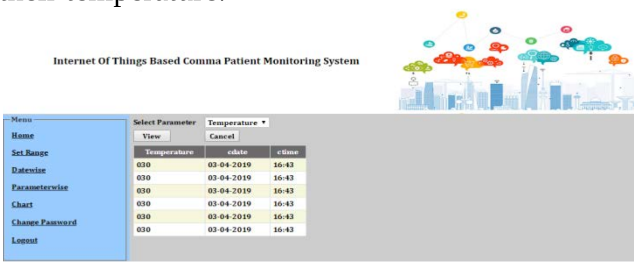


Fig 6. Parameter wise Temperature Page

PARAMETER WISE HEARTBEAT PAGE

The patient data can be viewed by the user by their temperature.

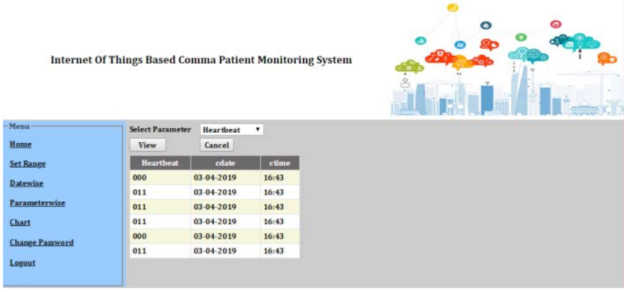


Fig 7.Parameterwise Heartbeat Page

CHART PAGE:

The chart was designed based on readed input data.

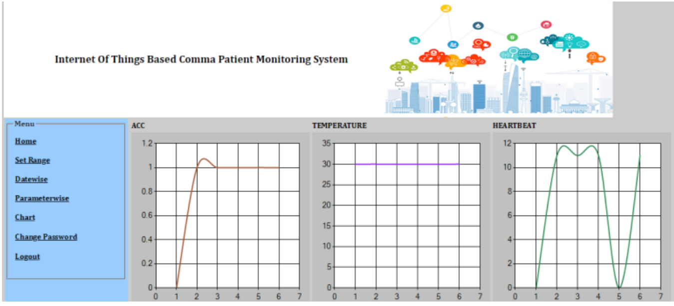


Fig 8. Chart Page

CHANGE PASSWORD PAGE

The user can change the password into new password of the user login system.

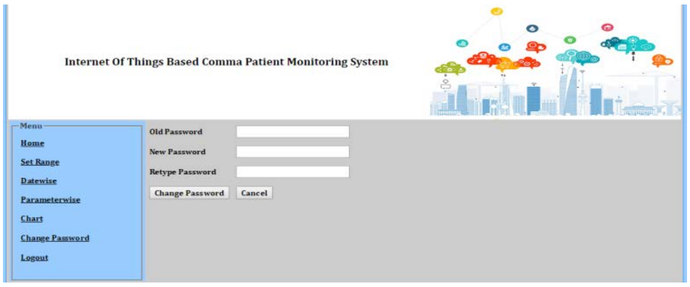


Fig 9. Change Password Page

EXCELPAGE DOCUMENT:

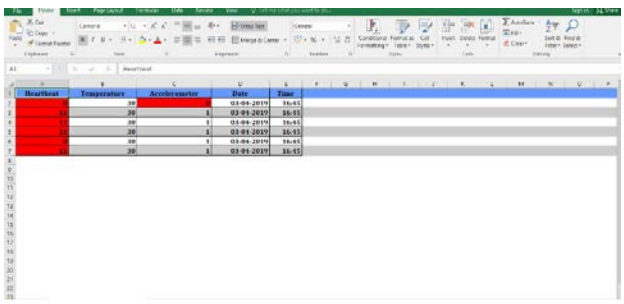


Fig 10. Excelpage document

V.CONCLUSION AND FUTURE ENHANCEMENT

IOT methodologies with medical industries are undoubtedly the core technologies of future IoT. Many researchers have studied various research issues on integrating IOT medical and sensor technologies. At present, efforts are being made to integrate these two technologies on the same IoT platform in different fields. Unlike conventional studies that provide IoT platforms at the architecture level only, this study proposed an implementation model of a sensor data repository on the basis of MongoDB. Furthermore, based on logistic process simulation of automotive parts, the proposed RFID/sensor data repository was empirically validated in terms of even distribution of data and query speed.

This phase is implemented up to IOT hardware unit, which works more perfect than expected.

This future work is based on the internet principle model, which connected the hardware with the internet model. Here the integrated sensor unit will be converted in to 32-bit serial bit data. The converted data will be centralized in a server for machine communication.

The integrated hardware will be communicated with the centralized server for sensor communication using serial bit data.

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