

IoT Analytics in Health Monitoring

Introduction:

Overview:

Now a days wireless technology is coming into the all sectors for making things better and smarter. In these recent years IoT is merging into all industrial sectors especially in automation and control. In medical field, it has a wide scope of service. Not only in hospitals, personal health care is achieved by IoT technology. So having smart system is cost effective, efficient, saves time and many more. By using iot one can monitor the health parameters of a patient regularly, and can take necessary precautions.

Purpose:

By this project, we can know the patient health parameters directly into mobile app or webpage everywhere and anywhere in the world.

Literature Survey:

Existing problem:

Let us consider, In a hospital a patient is on ventilator, the nurse or doctor has to move physically to check the condition of patient regularly. Thus, any critical situations cannot be found easily unless the nurse or doctor checks the patient's condition at the moment.

This may be a strain for the doctors who have to take care of a lot number of people in the hospital. Also, when medical emergencies happen to the patient, they are often unconscious and unable to press an Emergency Alert Button.

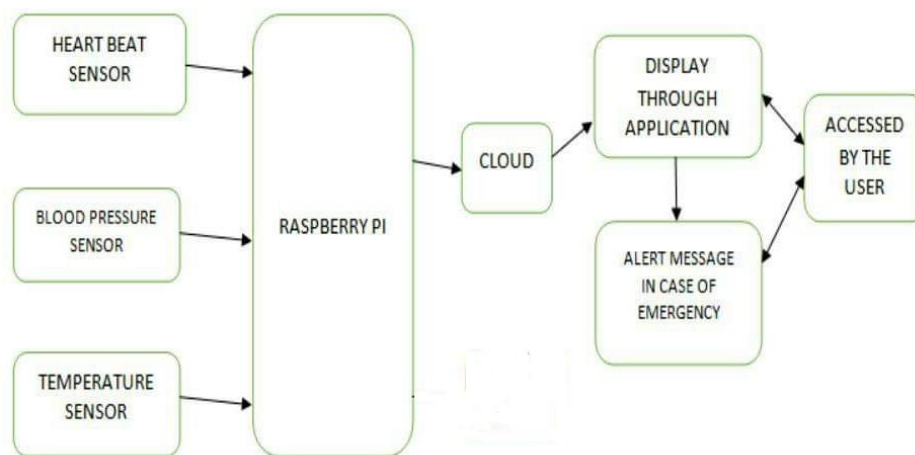
And also when ambulance is carrying a patient to hospital , after patient has reached to hospital he has to be check with the basic health parameters like BP, Pulse, Temperature , It takes much time.

Proposed solution:

By using IoT we can establish a connection between patient and nurses to get patient health parameters like Temperature, Pulse, Systolic Pressure, Diastolic Pressure etc., For ambulance services, this smart system allows doctors in the hospital to get to know health parameters in advance.

Theoretical Analysis:

Block diagram:



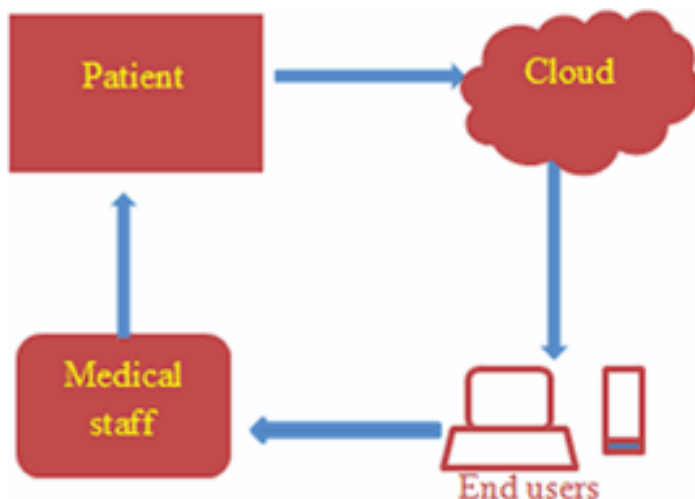
Hardware/ Software Designing:

The hardware of this project involves Raspberry pi or Arduino UNO with wi-fi module. The three sensors like temperature, blood pressure sensor and pulse sensor are attached with raspberry pi through ADC. The sensor values are read by the raspberry pi have been processed and sent it to the cloud through wi-fi module. The node red application is developed to fetch the values from IBM IOT platform and send it to the Watson studio for prediction. The Watson studio is deployed with machine learning model to get prediction. Finally, the predicted output from the Watson studio is displayed on the webpage. Here, we also developed a MIT App to get access to the patient relatives.

Experimental Investigation:

There are several IoT authentication challenges and issues that need to be understood before employing the right security solution that can dynamically vary with the situation. Based on certain critical situations such as IoT health applications, frequent authorization and authentication are necessary and could dynamically vary, potentially resulting in changes to the authorization of IoT devices. To address these issues, automated mutual authentication without user intervention is required in supporting users from remembering passwords for a large number of devices.

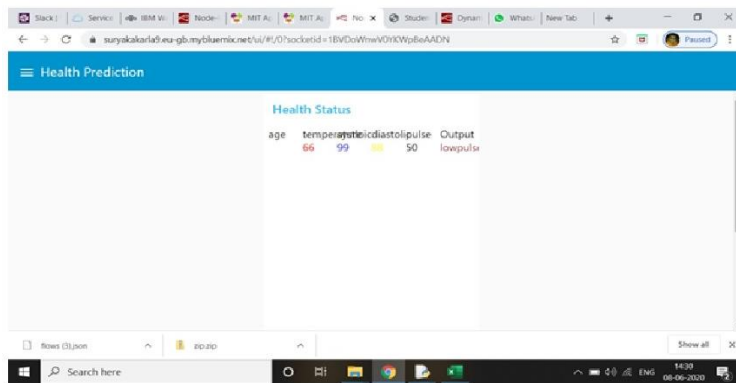
Flowchart:



Result:

The screenshot displays a mobile application interface titled "Screen1" with a status bar at the top showing the time 12:09 and various icons. Below the title, there is a section header "BODY PARAMETERS". Under this header, four parameters are listed, each with a corresponding input field containing a numerical value:

Parameter	Value
Temperature	49
PulseRate	53
SystolicPressure	115
DiastolicPressure	83



Advantages & Disadvantages:

Advantages of IOT in Healthcare:

The 'all-consuming' connection of health devices and data centralization brings many significant benefits to the table, such as:

- All-around technological enhancement. Rendering hospital visits unnecessary, passively accumulating and deeply analysing important health data, etc., We've already pondered on all these advanced tech capacities galore enough. The IoMT provides space for fantastic long-term innovations.
- Cost savings. One of the greatest advantages of IoT in healthcare is that efficient autonomous systems will cost less to manage and 'employ' in the long run. Things are even better when it comes to patient cost savings due to fewer hospital journeys as well as accelerated diagnostics and treatment.
- Accessibility: Doctors can view all the necessary data on command and check real-time patient conditions without leaving their office.

Disadvantages of IoT in healthcare:

Alternatively, some downsides that come along with the massive implementations of the IoT in healthcare include:

- Privacy can be potentially undetermined: As we've already mentioned, systems get hacked. Lots of attention will need to

be focused on data security, which requires significant additional spendings.

- Unauthorized access to centralization: There is a chance that dishonest interlopers may access centralized systems and realize some cruel intentions.
- Global healthcare regulations: International health administrations are already issuing guidelines that must be strictly followed by government medical establishments integrating the IoT in their workflow. These may restrict possible capacities to some extent.

Applications:

- Medication management app
- Fitness apps
- Body, activity & sleep tracking apps
- Pregnancy monitoring apps
- Individual health recording apps
- Tracked Ingestible Sensors
- Remote Patient Health Monitoring

Conclusion:

Thus, the proposed smart system could be able to read health parameters and send it to cloud where processing takes place based on data set and gives health condition of patient. It monitors the vital signs and sense abnormalities. These abnormalities alert the medical staff, it reduces the manual monitoring.

Future Scope:

In future, the automation in health care takes place and doctor could be able to check patient's health from his home.

Bibliography:

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