**Analytics of Health Monitoring System using IoT**

**Externship Project**

**TABLE OF THE CONTENT:-**

**1. INTRODUCTION**

**1.1 Objectives**

**2. THEORITICAL ANALYSISS**

**2.1 Block diagram**

**2.2 Hardware/software designing**

**3. PYTHON CODE**

**4. RESULT**

**5. UI OUTPUT**

**6. ADVANTAGES & DISADVANTAGES**

**1.INTRODUCTION:-**

Health is one of the global challenges for humanity. In the last decade the healthcare has drawn considerable amount of attention. The prime goal was to develop a reliable patient monitoring system so that the healthcare professionals can monitor the patients, who are either hospitalized or executing their normal daily life activities.

Recently, the patient monitoring systems is one of the major advancements because of its improved technology.Currently, there is need for a modernized approach.

In the traditional approach the healthcare professionals play the major role. They need to visit the patient’s ward for necessary diagnosis and advising. There are two basic problems associated with this approach. Firstly, the healthcare professionals must be present on site of the patient all the time and secondly, the patient remains admitted in a hospital, bedside biomedical instruments, for a period of time. In order to solve these two problems, the patients are given knowledge and information about disease diagnosis and prevention. Secondly, a reliable and readily available patient monitoring system (PMS) is required. In order to improve the above condition, we can make use of technology in a smarter way. Wearable sensors are in contact with the human body and monitor his or her physiological parameters. We can buy variety of sensors in the market today such as ECG sensors, temperature sensors, pulse monitors etc. The cost of the sensors varies according to their size, flexibility and accuracy. The cloudant db which is a cheap, flexible, fully customizable and programmable small computer board brings the advantages of a PC to the domain of sensor network. In our system we are measuring patient’s parameters (ECG, temperature, heart rate, pulse, etc) with different available sensors. These sensors collected data i.e. biometric information is given to raspberry pi and then it is transferred to server.

1.1 **Objectives:-**

1.Internet of Things (IoT) is the emerging technology, which contains huge amount of smart object and smart devices connected to the internet for communicating with each other.

2. In this project to analyze and compute the patient health we are using Raspberry Pi, which is the heart of this project.

3.These smart devices are used to collect temperature, blood pressure, sugar level, heartbeat, lung and respiration information etc., which are used to evaluate the health condition of the patient.

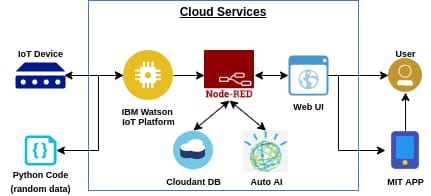
4.The final results are displayed on the android device, on web server and also the results are sent to the user through SMS.

5. These data results can be stored in data base centre which can be invoked from remote location at any time in an emergency case of patient without delaying the time.

6.This project may play vital role in saving the patient life at emergency time since “Time is life”

**2. THEORITICAL ANALYSIS:-**

**2.1Block Diagram:**



**2.2 Software Requirement:-**

* Python idle.
* IBM Watson
* Cloudant
* MIT App Inventor
* Node Red
* web ui

**3.PYTHON CODE**

import time

import sys

import ibmiotf.application

import ibmiotf.device

import random as rn

import json

#Provide your IBM Watson Device Credentials

organization = "4yerxq"

deviceType = "iotdevice"

deviceId = "1001"

authMethod = "token"

authToken = "1234567890"

# Initialize the device client.

pulse=0

bp=0

temp=0

def myCommandCallback(cmd):

print("Command received: %s" % cmd.data['command'])

if cmd.data['command']=='lighton':

print("LIGHT ON IS RECEIVED")

elif cmd.data['command']=='lightoff':

print("LIGHT OFF IS RECEIVED")

if cmd.command == "setInterval":

if 'interval' not in cmd.data:

print("Error - command is missing required information: 'interval'")

else:

interval = cmd.data['interval']

elif cmd.command == "print":

if 'message' not in cmd.data:

print("Error - command is missing required information: 'message'")

else:

print(cmd.data['message'])

try:

deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}

deviceCli = ibmiotf.device.Client(deviceOptions)

#..............................................

except Exception as e:

print("Caught exception connecting device: %s" % str(e))

sys.exit()

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times

deviceCli.connect()

while True:

pulse=rn.randint(80,100)

bp=rn.randint(80,120)

temp=rn.randint(97,104)

#Send Temperature & Humidity to IBM Watson

data = {"d":{ 'pulse': pulse,'bp': bp,'temperature':temp}}

#print data

def myOnPublishCallback():

print ("Published pulse = %s %%" %pulse, "BP = %s %%" %bp,"Temperature= %s" %temp ,"to IBM Watson")

success = deviceCli.publishEvent("Data", "json", data, qos=0, on\_publish=myOnPublishCallback)

if not success:

print("Not connected to IoTF")

time.sleep(1)

deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud

deviceCli.disconnect()

### 4.UI OUTPUT:-

**5.NODE RED**

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### 6.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 analyzing 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 implementation of the IoT in healthcare include:

* Privacy can be potentially undermined. 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 governmental medical establishments integrating the IoT in their workflow. These may restrict possible capacities to some extent.

**CHAPTER 06**

**6.0 Conclusion**

In conclusion, I am well satisfied with my training. I have learned many new concepts, acquired a number of new technical skills and improved another group of existing skills. What I liked most about my training is that it is very strongly related to new emerging technology. This refutes the common saying that very little of the materials taught in university engineering courses is used by engineers working in the labor market. This dependency (relationship) is clearest in engineering design. I may count the technical skills that I learned or improved at the training site, other than those gained at college. At last, I hereby conclude that I have successfully completed my industrial training in Smart Bridge and gained knowledge.

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