IOT-BASEDPATIENTHEALTHMONITORING SYSTEM·

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*Abstract:*TheIoT-basedpatienthealthmonitoringsystemaimstoprovideareliableandreal-timehealthmonitoring solution using modern technology. The system leverages an ESP8266EX microcontroller, an I2C LCD display, a humidity sensor, the MAX30100 sensor for measuring heart rate and oxygen saturation (SpO2), and a buzzer for alerts. This project integrates these components to continuously monitor and display vital health parameters, facilitating timely intervention and management of patient health. With the increasing demand for remote health monitoring solutions, this project addresses the need for a costeffective and efficient system that can provide real- time data to caregivers and medical professionals. The primary objective is to develop a system that monitors key health parameters, namely humidity, heart rate, and SpO2 levels, and alerts the user through a buzzer and a mobile application using the Blynk IoT platform. The implemented system successfully monitors the patient's health parameters and provides real-time updates on the I2C LCD display and the Blynk mobile application. The buzzer effectively alerts users to any anomalies, ensuring prompt attention and action. The project demonstrates the feasibility and effectiveness of using IoT technology for patient health monitoring, offering a scalable solution that canbeexpandedwithadditionalsensorsandfunctionalities.Thissystemprovidesasignificantcontributiontowards improving patient care and health management in both home and clinical settings

Index Terms -IOT , Sensors, Health Monitoring .

I. INTRODUCTION

Monitoringpatients,especiallyelderlyones,hasbecomeincreasinglychallenginginmoderntimes.Keepingtrack of a patient's health status at home is particularly difficult, and caregivers often need timely updates on the patient's condition while they are at work.To address these challenges, we propose an innovative system that simplifiesandautomatesthetaskofhealthmonitoring.Thisprojectaimstodesign,develop,andimplementan IoTbasedpatienthealthmonitoringsystem.Thesystemwillcontinuouslymonitorvitalhealthparameterssuch as heartrate,oxygensaturation(SpO2),andhumiditylevels aroundthepatient.Thedatacollectedbythesystem willbetransmittedinreal-timetohealthcareproviders,ensuringcontinuoussupervisionandpromptintervention when needed. The project integrates both hardware and software components. The hardware includes the ESP8266EXmicrocontroller,MAX30100sensorforheartrateandSpO2measurement,ahumiditysensor,anI2C LCD display for showing real-time data, and a buzzer for alerting. The software component involves data processing,userinterfaces,andanalertsystemviatheBlynkIoTmobileapplication.Whenanyabnormalitiesare detectedinthemonitoredparameters,thebuzzerwillsound,promptinguserstocheckthedetailedinformation through the Blynk mobile app. This system provides a reliable and efficient way to continuously monitor a patient's health, reducing the need for frequent hospital visits and ensuring timely medical intervention. It enhancespatientcareandoptimizeshealthcareresources,makingitavaluabletoolforbothhomeandclinical environments.

II. LITERATURE SURVEY

The literature survey indicates that existingIoT-based patient health monitoring systems are proficient in continuous real-time monitoring and data collection but generally lack immediate alert mechanisms for abnormal health conditions. These systems successfully track vital signs such as ECG, heart rate, and temperature, storing data on cloud platformsfor remote accessand long-termanalysis. However,they do notinclude real-time alertsto notify usersofdeviationsfromnormalranges.Thisprojectaddressesthisgapbyincorporatingabuzzerthatsoundswhen abnormalities are detected. Users can then check the Blynk IoT mobile app for detailed information. This approach enhancespatientsafetybyprovidingimmediatealertsthroughbuzzer.
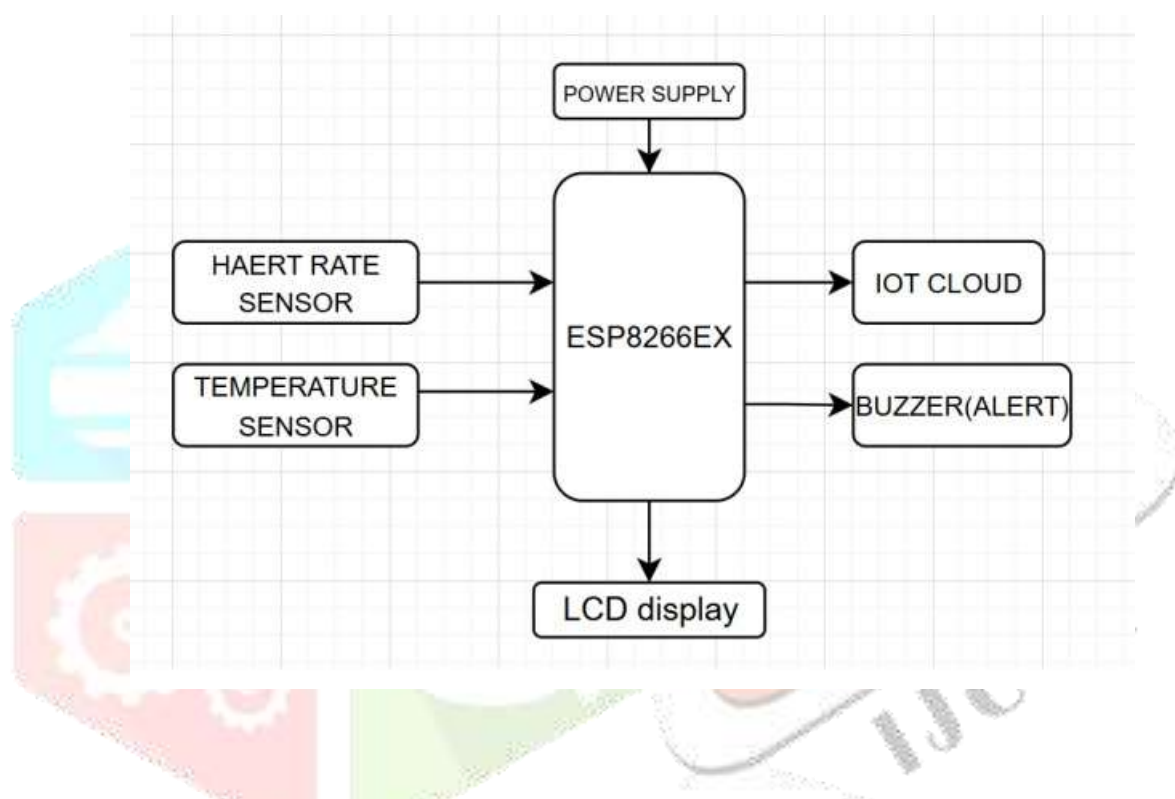
III. RESEARCH METHODOLOGY

Fig1.:BlockDiagramOfIOTBasedPatientHealthMonitoringSystem

This project aims to create a system that continuously monitors a patient's vital signs and provides real-time alerts when there are abnormalities. How It Works: The sensors continuously measure the patient's vital signs. The MAX30100 sensor records heart rate and SpO2 levels, while the humidity sensor monitors the surrounding environmental conditions. The ESP8266EX microcontroller collects the data from these sensors. It then processes thedatatodetermineifthereadingsarewithinnormalranges.Predefinedthresholdsaresetforeachparameter(e.g., normal heart rate range). If the sensor readings are within normal ranges, the system continues to monitor without any alerts. If any parameter goes beyond the safe limits, the ESP8266EX triggers the buzzer. The buzzer makes a sound to alert the user that something is wrong and needs attention. Simultaneously, the ESP8266EX sends the healthdatatotheBlynkIoTplatformusingWi-Fi.TheBlynkmobileappdisplaysthisdatainreal-time,allowingremote monitoring. When the buzzer sounds, the caregiver or medical professional can open the Blynk app on their mobile devicetoseewhichparameterisabnormalandtakeappropriateaction.Thisensuresthatthepatientgetstimelyhelp when

IV. RESULTS AND DISCUSSION

needed. In summary, the system continuously monitors vital signs using sensors and the ESP8266EX microcontroller.Itprovidesimmediatealertsthroughabuzzerifanyhealthparametersbecomeabnormalandallows remote monitoring through the Blynk mobile app. This setup ensures continuous, real-time health monitoring and quick responses to potential health issues

TheIoT-basedpatienthealthmonitoringsystemwithMAX30100,ESP8266EX,buzzer,andI2CLCDmonitorsheart rate,SpO2,andtemperature.Real-timedataisdisplayedontheLCDandsenttotheBlinkIoTappforremoteaccess.

Ifthetemperatureexceedsasetthreshold,thebuzzersounds,anda"HIGHTEMPALERT!"isshownontheLCD.The BlinkIoTappcontinuouslyreceivesdata,butonlythebuzzerandLCDhandletemperaturealertslocally.Thesystem ensures efficient health monitoring with immediate local alerts and remote data access.

V. CONCLUSION

TheIoT-basedpatienthealthmonitoringsystem successfullyintegrates moderntechnologytoprovidecontinuous and efficient monitoring of vital signs. By leveraging the ESP8266EX microcontroller, MAX30100 sensor, humidity sensor, I2C LCD display, and buzzer, the system ensures real-time tracking of heart rate, oxygen saturation, and environmentalconditions.Thebuzzerprovidesimmediatealertswhenabnormalitiesaredetected,promptingusers to check the Blynk IoT mobile app for detailed information. This feature enhances patient safety by facilitating timely medical intervention. The remote monitoring capability of the Blynk app allows caregivers and healthcare professionals to oversee patient health from anywhere, improving the overall efficiency of patient management. This system offers a valuable tool for home healthcare, chronic disease management, and hospital settings, showcasing the potential of IoT in advancing patient care and health monitoring

VI. ACKNOWLEDGMENT

VII. REFERENCES

1. Satija,U..,Ramkumar,Barathram.,&Manikandan,M.Sabarimalai.(2017).Real-TimeSignalQuality-AwareECG TelemetrySystem for IoT-BasedHealth Care Monitoring.IEEE Internet of Things Journal, 4. http://doi.org/10.1109/JIOT.2017.2670022815-823

2. InternetofThings(IoT)BasedHealthcareMonitoringSystemusingNodeMCUandArduinoUNOKhinThetWai, Nyan Phyo Aung, Lwin Lwin Htay https://doi.org/10.31142/ijtsrd26482

3. HealthMonitoringsystemusingIoTShivleelaPatill,Dr.SanjayPardeshi2e-ISSN:2395-0056

4. F.Shaninetal.,"PortableandCentralisedE-HealthRecordSystemforPatientMonitoringUsingInternetofThings (IoT)," 2018InternationalCET Conference onControl, Communication, andComputing(IC4), Thiruvananthapuram, India, 2018, pp. 165-170, doi: 10.1109/CETIC4.2018.8530891.