CENTRALIZED HEALTH MONITORING SYSTEM IN HOSPITALS

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ABSTRACT

One hospital employee may only watch one patient at a time, which is one of the main issues with the present health monitoring systems in hospitals. For nurses and physicians, this restriction adds to the workload and complexity, particularly when done manually. Examining each patient's health state. For ventilated patients, who need immediate, continuous monitoring of their body temperature, respiratory rate, and oxygen levels, the situation is much more dire. This research suggests designing a centralized health monitoring system that can remotely follow the critical health parameters of patients using ventilators in order to address these issues. Heart rate, breathing rate, and oxygen saturation are just a few of the vital health data that this device will continuously collect and send to a secure web platform. Theprovision of healthcare is the main goal.

I.   INTRODUCTION

Effective patient health monitoring is crucial in contemporary healthcare institutions. particularly for people in need of critical care, such ventilator-dependent patients. The fact that a single member of the healthcare staff can normally only supervise one patient at a time frequently limits the capabilities of the current health monitoring systems. Due to this restriction, doctors and nurses must manually confirm each patient's health status, which puts significant burden on them and may cause missed appointments and delays in patient care. Particularly, patients on ventilator need to have their heart rate, temperature, and oxygen saturation accurately and continuously monitored. Serious health issues may arise from any error or delay in monitoring these indicators. The healthcare delivery process is made more difficult by the labour-intensive and human error-prone nature of the current manual procedures. This suggests creating a centralized health monitoring system to remotely monitor and control the health parameters of ventilator-dependent patients in order to address these issues. This system will collect and send real-time data on important health variables to a secure web platform using cutting-edge technologies. The system seeks to improve patient outcomes, expedite hospital workflow, and increase the quality of patient care by giving medical staff immediate accessto critical patient data.

II.   LITERATURE SURVEY

A crucial development for enhancing patient care and operational effectiveness is the centralization of hospital health monitoring systems. Healthcare providers can improve data accessibility, promote real-time decision-making, and streamline communication by combining many monitoring technologies into a single platform. The advantages, difficulties, and creative approaches related to centralized health monitoring systems in clinical settings are examined in this review of the literature. Patil et al.

[1] (2024) A Centralized Health Monitoring System to improve patient care by integrating sensor technology, real-time data processing, and secure networks. Abdulmaleket al.

[2] (2022) A comprehensive review of IoT-based healthcare monitoring systems, examining their effectiveness, efficiency, security and privacy aspects. They classified healthcare monitoring sensors, discussed challenges and open issues, and provided recommendations for future IoT healthcareapplications. Shafi et al.

[3] (2024) An IoT- based patient health monitoring system to address the challenges posed by the COVID- 19 pandemic. Their system utilizes sensors, an ESP-32 microcontroller, and cloud storage to collect and analyse vital patient data in real- time. This approach aims to improve patient care by enabling remote monitoring and earlydetection of health issues. Pawar et al.

[4] (2024) An IoT-based patient health monitoring system that collects vital signs data from patients using mobile devices and transmits it to a central care center. The system analyses the data to detect abnormalities and alerts healthcare providers in case of critical incidents, aiming to improve patient outcomes and reduce healthcare costs. Reddy andKumar

[5] (2023) A statistical review of Health Monitoring System Models (HMSMs), comparing various models based

on IoT, ML, blockchain, and other technologies .They introduced performance metrics (HM3) to evaluate models and provided a comprehensive analysis to aid in modelselection for specific healthcare applications.

III.   BLOCK DIAGRAM
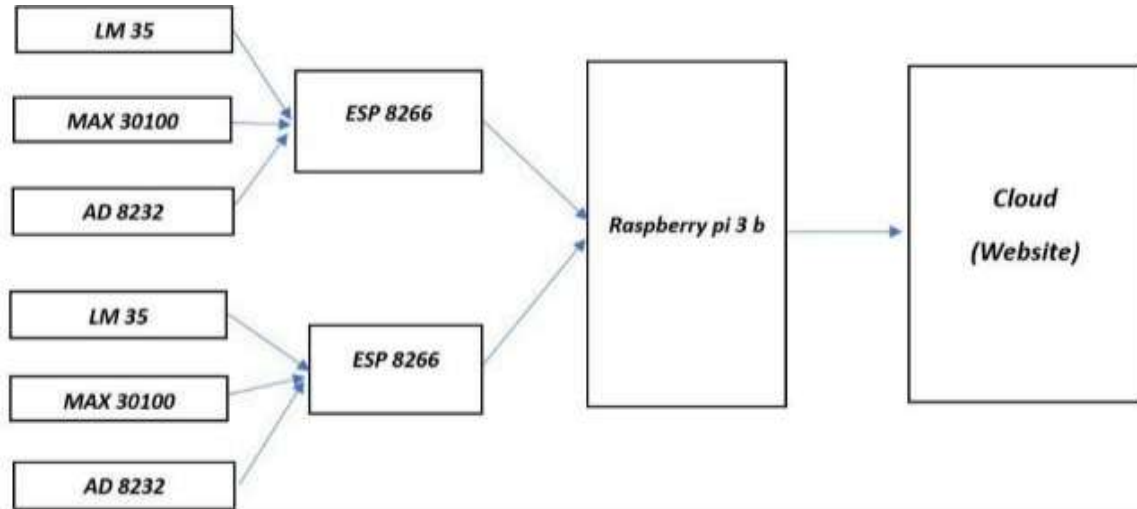
Figure 1: Block Diagram

A patient's critical information is gathered via the healthcare monitoring system's numerous sensors, which include an ECG, temperature, and heartbeat sensor. A Raspberry Pi serves as the central unit that receives the data from these sensors and is in charge of collecting and sending it. As the center for data collecting, the Raspberry Pi makes sure that each sensor's readings are processed and sent for additional examination. A data processing and monitoring system receives this collected data, evaluates the values, and gets them ready for remote access. The processed data is sent to a Cloud Storage system via the Internet and kept safely there. This cloud storage allows both medical professionals and caregivers to keep an eye on the patient's condition in real time, guaranteeing prompt treatment and intervention when needed. This setup creates a streamlined, continuous flow of vital health data from the patient's body to medical professionals, enhancing remote patient monitoring and healthmanagement.

IV.   DESIGN AND DEVELOPMENT

A hospital's Raspberry Pi-based centralized health monitoring system gathers patient data from sensors (heartbeat, temperature, ECG). After processing this data, the Raspberry Pi transmits it to a monitoring system linked to cloud storage over the internet. Doctors and caregivers can monitor patient vitals in real- time by using a web ormobile interface to retrieve the data. Important Elements:

Sensors: Measure vital signs (heartbeat,temperature, ECG).

Raspberry Pi: Collects and transmits sensordata to the cloud.

Cloud Storage: Stores the data for centralizedaccess.

Monitoring System: Displays real-time datafor doctors and caretakers.

Alerts: Triggered when abnormal readings aredetected.

The system is designed for continuous monitoring, providing healthcare staff with real-time access to patient data.

V.   CONCLUSION

After doing this review, I've come to the conclusion that this system will be useful forstudents, patients, athletes, and gymnasts to quickly analyse their health from anywhere. This complete health monitoring system can be combined into a tiny, portable device the size of a wristwatch or cell phone. This will make it easier for the patients to take the equipment with them wherever they go. Project developers for biomedical device systems will also find it helpful.

VI. REFERENCES

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