Iot Based Icu Patient Monitoring Smart System

Abstract:

The IoT-Based ICU Patient Monitoring Smart System is designed to provide continuous, real-time monitoring of critical patient health parameters within an ICU setting. The system uses IoT-enabled sensors to measure vital signs such as heart rate, blood pressure, oxygen saturation (SpO2), body temperature, and respiratory rate. These health metrics are continuously sent to a cloud-based platform where data can be processed, stored, and analyzed. By leveraging cloud services and IoT technology, the system enables remote access to real-time data for healthcare professionals, allowing them to monitor multiple patients simultaneously and respond quickly to any abnormal changes. This smart monitoring solution reduces the workload of ICU staff, enhances patient safety, and improves response times for critical interventions.

Existing System:

Traditional ICU monitoring systems are often complex and limited by wired configurations, making them less flexible for real-time remote monitoring. Additionally, these systems may lack integrated data analytics or alerting capabilities, meaning healthcare staff must be physically present to assess vital data, which can lead to delays in critical care.

Proposed System:

The proposed IoT-based ICU monitoring system utilizes wireless sensor technology to collect real-time patient data and transmits it to a cloud platform. The data is then analyzed, and alerts are automatically triggered for any abnormal readings, allowing healthcare providers to take timely action. The system provides remote access to data, enabling healthcare staff to monitor patients from anywhere. This scalable solution can handle multiple patients and integrates advanced data analytics and visualization for quick interpretation, enhancing efficiency and patient care quality in ICUs.

Key Features:

Continuous Health Monitoring: Tracks and records critical patient health metrics in real-time, ensuring no vital change goes unnoticed.

Automated Alerts: Sends alerts to healthcare providers if any vital signs deviate from safe ranges, enabling rapid response to potential health emergencies.

Remote Access: Enables authorized healthcare personnel to monitor patients remotely, increasing flexibility and reducing the need for constant in-person observation.

Data Analytics and Visualization: Provides data analysis and visualization of patient trends over time, assisting healthcare staff in decision-making.

Software Tools:

AWS IoT Core: Connects IoT sensors to the cloud, ensuring secure, real-time data transmission.

AWS Lambda: Processes data as it arrives, identifying abnormal values and triggering alerts.

Amazon SNS (Simple Notification Service): Sends instant notifications to healthcare staff in case of critical health alerts.

Amazon RDS or DynamoDB: Stores patient data, allowing for real-time monitoring and historical analysis.

AWS CloudWatch (optional): Monitors the system's health, alerting staff to any operational issues.

Hardware Tools:

IoT Health Monitoring Sensors: Devices for tracking heart rate, blood pressure, body temperature, respiratory rate, and SpO2.

IoT Gateway: Collects data from the sensors and transmits it to AWS IoT Core.

Mobile/Tablet Device: For healthcare staff to view alerts and access the patient monitoring dashboard remotely.

AWS Cloud Infrastructure: Hosts the cloud-based platform, ensuring data processing, storage, and alerting capabilities.