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## SOLDIER HEALTH MONITORING SYSTEM USING IOT

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### **Abstract:**

*The protection of soldiers is a crucial aspect of any nation's defense system, particularly during a war with an enemy. There are various technologies available to monitor soldiers' health conditions and ensure their safety. The suggested system tracks the soldier's direction by utilizing GPS technology to calculate their latitude and longitude coordinates, making it easier to locate them. This GPS technology can be installed on the soldier's body, and the details can be sent to the control panel using IoT. The system comprises small wearable physiological devices, sensors, and transmission modules, which makes it an affordable option to safeguard soldiers' lives on the battlefield. To provide wireless tracking and monitor the soldier's heart rate and body temperature, the design of the system makes use of GPS and GSM technology. It is important to consider the privacy and security risks associated with the system, and it is crucial to ensure that strong encryption and authentication protocols are in place to protect against cyber threats.*

### **INTRODUCTION:**

The security and safety of troops in the army, navy, and air force is of utmost importance for maintaining the country's security. In the past, there have been instances of soldiers losing their lives due to a lack of communication and medical support during combat. In light of this, a project has been developed to monitor the soldiers' health and location using GPS and GSM technologies. Biomedical sensors like temperature and heart rate sensors are used to monitor soldiers' health parameters. Real-time transmission of

this data to the base station enables prompt medical attention in case of emergencies, reducing the rescue and search operation effort. Wearable technology is a crucial aspect of this project. As India has faced military conflicts in the past, it is imperative to prioritize navigation and health monitoring technology for soldiers in war zones. This project aims to provide soldiers with timely medical assistance, thereby ensuring their safety and reducing casualties.

### **PROBLEM DEFINITION:**

The defence services are rapidly expanding their technological research to keep up with modern times. The safety of soldiers is of utmost importance since they are the ones defending the nation against attackers. Border security is crucial in today's world, and the Army, Navy, and Air Force play a major role in ensuring national security. The safety of soldiers is a complex issue, and it is important for the army base station to be aware of their precise location and health status once they join the battlefield. Soldiers are lost or injured in combat every year, which is why tracking their location is vital. The challenge is to determine which technology would be most effective in addressing this issue quickly and accurately.

## **DRAWBACKS RELATED TO THE EXISTING SYSTEM:**

The disadvantage of present systems is that they depend on the databases that are provided to them, such as chatGPT, which prevents us from getting real-time data on soldiers' conditions like as heart rate and temperature.

## **HOW TO OVERCOME:**

The issue we're attempting to solve with IoT. Where we are suggesting a method to obtain real-time data on a soldier, such as heart rate, temperature, etc. Here, we'll create a prototype model using a WLAN node, Microcontroller, and DHT-1 temperature sensor.

## **Technology Used:**

IoT:

The Internet of Things (IoT) is a technology that connects physical items with electronics to allow them to communicate with each other and their environment. This innovative technology has the potential to revolutionize people's daily lives by providing advanced services in various fields such as medicine, present, there are over 9 billion physical devices connected to the internet, and this number is expected to increase to 20 billion in the near future. In order to create a prototype version of the project, JSP and servlet technologies will be used, and it will be hosted locally on the user's computer. The system will communicate via a wireless local area network, which will have limited connectivity. However, in the future, the project will be hosted via WAN, allowing it to communicate with the internet.

## **LITERATURE SURVEY(Research Done in this topic)**

**1.Soldier Health and Position Tracking System, Akshita V. Armarkar , Deepika J. Puneekar , Mrunali V. Kapse, Sweta Kumari, Jayshree A. Shelk, International Journal of Engineering Science and Computing,**

Here are the paragraphs in a reshuffled order:

1. GPS is employed for soldier tracking, while GSM is used to offer a wireless communication system. Using biomedical sensors like temperature sensors, we are keeping track of the soldier's health metrics and a heart rate monitor. In order to outfit the soldiers appropriately in the event of any climatic changes, an oxygen level sensor is utilised to detect atmospheric oxygen
2. In his essay, we concentrate on monitoring a soldier's location using GPS, which is helpful for the control room station to know the soldier's precise location and to direct them accordingly. Moreover, high-speed, short-range wireless connections between soldiers are used to transmit data on situational awareness, GPS navigation, bio-medical sensors, and wireless communication.
3. Constant Communication is Possible: Troops may communicate with one another at any time and from any location utilising RF, DS-SS, and FH-SS. Lower power consumption and less sophisticated circuitry. Using an ARM CPU and peripherals with low power requirements lowers the system's overall power consumption. The utilised modules are portable because of their compact size and light weight. Security and safety for troops: GPS records a soldier's

whereabouts anywhere on the planet, and a soldier's key health parameters are monitored by a health system, providing security and safety for soldiers.

4. The article describes a method for tracking and monitoring troops' health that is based on the Internet of Things (IoT). The suggested device may be installed on the soldier's body to use GPS to track their whereabouts and health status. Using IoT, these details will be sent to the control panel. Small wearable physiological devices, sensors, and transmission modules make up the proposed system. Thus, it is conceivable to adopt a low-cost system to defend the priceless human life on the battlefield with the use of the proposed equipment.

5 This system records all parameters in real time and transmits them to the base station using a GPS module and a wireless body area sensor network. The many sensor types employed in this system, including the humidity sensor, temperature sensor, and pulse sensor,

aid in determining the state of health of that specific army officer. The most crucial component of this endeavor is wearable technology.

### PROPOSED ARCHITECTURE

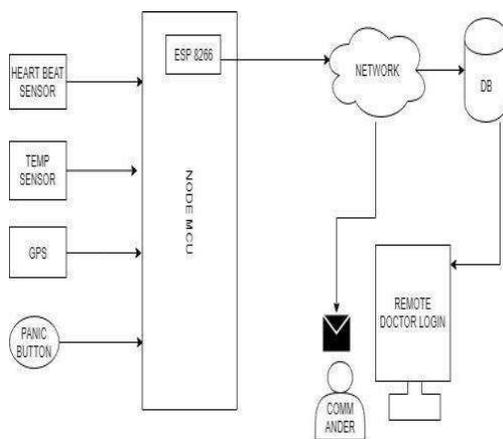


FIG:SOLDIER HEALTH MONITORING & TRACKING SYSTEM USING IOT

Algorithm:

The database is encrypted with AES.

Round keys are a specific collection of specially generated keys used in the encryption process.

They are used on an array of data that contains exactly one block of data—the data that will be encrypted—along with additional operations.

We refer to this array as the state array.

STEP 1: We will first use the cypher key which determines the set of the round keys

Block data is been set as the state array initial value. (plaintext).

Add the beginning state array's first round key.

Nine iterations of state manipulation we have to make.

Complete the tenth and final state manipulation round.

Copy the final state array out as the encrypted data (cipher text).

Flow of System:



Here, the sensors will gather medical data from the soldier and send it via the network to the database, where it will be recorded and shown online. The

medical history of a soldier will be shown on the website and will be available to the doctor, allowing us to follow the soldier's healthcare in real time.

### CONCLUSION:

An IoT-based system for tracking and monitoring the troops' health is described in the study. For the aforementioned purpose, an inexpensive Arduino board is employed. Every soldier's pulse, body temperature, and ambient characteristics are sent to the control room using biomedical sensors. By accurately locating a lost soldier who is in critical condition, this technology can assist to solve the problem of soldiers going missing in combat. The addressing system aids in providing accurate navigation to the control room and enhancing communication amongst soldiers when there is an emergency. Hence, it follows that this system will serve as a lifeguard for army soldiers across the world. A portable handheld sensor gadget with higher sensing capabilities might be created in the future to help the warriors.

### FUTURE SCOPE:

In future GOI hosts the project using WAN, it can communicate world wide web. Also the sensors used will be an industrial sensor apart from that even GOI can take a step under make In India and start manufacturing medical sensors and controllers in India especially for army sector or we can take an initiative if we will get any sponsorship from GOI.

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