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IoT based Soldier Health Monitoring and Tracking System

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Abstract:- Soldiers play a key role in the security system of the country. So, it's a prime responsibility to provide security to a soldier also. This proposed project uses a health monitoring and tracking system to check health by records & track the location of the soldier by Longitude and Latitude details. The sensors are fitted on soldier's body, and with the help of a GPS tracker, thorough IOT, the data will be transmitted to the control room. The project is to contrivance a mechanism to protect valuable human life on the battlefield.

Keywords:- *IoT Technology, Heartbeat/Pulse Sensor, Temperature sensor, GPS tracker.*

I. INTRODUCTION

Security of any country is monitored by the Defense which includes ARMY, NAVY, and AIR FORCE. The soldiers who are at more risk are the ARMY who stay near the boundaries & keep watch on the various activities. The life of these soldiers is always at high risk and unaware of the unknown facts that may affect the scrutiny of the area. It's the biggest challenge for the headquarters to get the health record and location of any soldier on the field. For soldiers, safety is the main factor to consider so we did brainstorming to develop a kit to monitor the health & location of a soldier, so as will help to provide necessary medical help. Using GPS soldiers are tracked and a wireless communication system is provided using GSM for monitoring the health parameters of soldiers, we have used biomedical sensors such as heartbeat sensors and temperature sensors, it is essential for the headquarters to determine the exact location and soldiers' health status, Using this project, in on-time the location and the health reading of the soldier can be sent to the Head office & battalion so that the immediate actions can be taken in case of emergency. This technology helps to reduce the rescue, time, and search operation effort of the army unit. This is a wearable technology which is the most important factor of this project.

II. METHODOLOGY

A. Software Requirements:

- Operating System: Microsoft Windows 7 and Above
- Programming Language: Java
- IDE: Net beans

B. Hardware Requirements:

- Processor: Intel Core I3 or Higher
- RAM: 4 GB or Higher
- Hard Disk: 100 GB (min)
- Controller: Node MCU
- Sensors: Heartbeat, Temperature, GPS tracker.

C. Sensors :

a) Controller: Node MCU:
Data transfer using WIFI Protocol is possible by connecting it to the Node MCU ESP8266.

Fig. 1

b) Heartbeat Sensor:
The Heartbeat using pulse sensor SEN – 11574. The principle behind the working of the Pulse Sensor is Photoplethysmography. As per the principle, the changes in the flow of blood in a body, are measured by the changes in the intensity of the light passing through that organ.

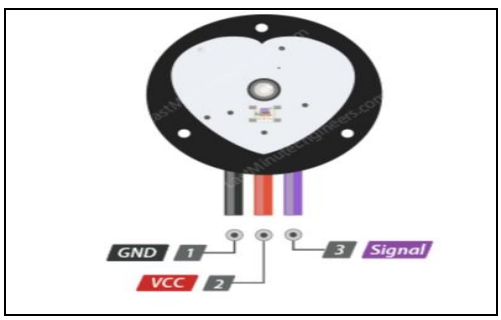

Fig. 2

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c) Temperature Sensor:
The (DHT11) consists of a humidity sensing component, an NTC temperature sensor (or thermistor), and an IC on the backside of the sensor. For measuring humidity, two electrodes with moisture-holding substrates between them are used.

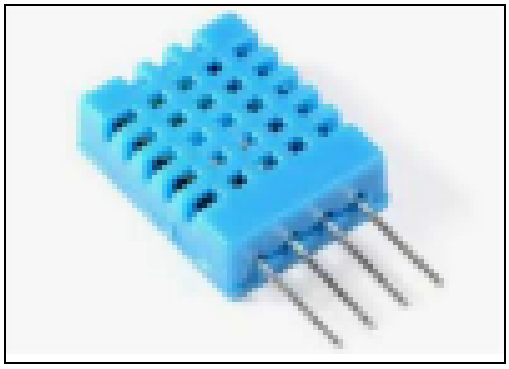


Fig. 3

d) GPS tracker:
GSM localization uses multiliterate to determine the location of GSM mobile phones, or dedicated trackers, usually with the intent to locate the user.

Fig. 4

e) Waterfall model:
The Waterfall Model is among the very first and old models of software development life cycle. It is also called a linear-sequential life cycle model. This is very simple and easy to understand or use. This is a step-by-step method so the next step can can only be begun once earlier has been completed. This is mainly used for a small-scale projects. The constant or fixed requirements should be there for this type of model.

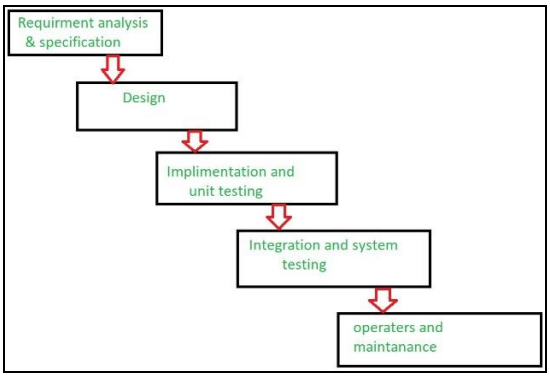
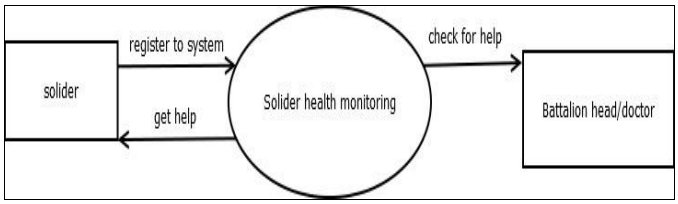
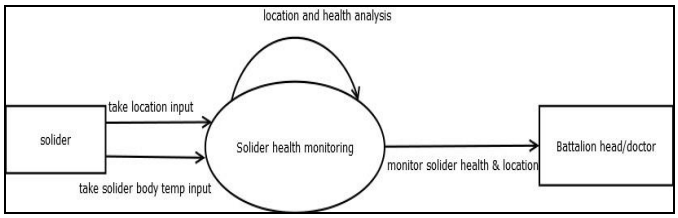


Fig. 5

III. DATA FLOW



Data Flow Diagram – Level 0



Data Flow Diagram – Level 1

IV. SEQUENCE OF OPERATION

- The First soldier has to register himself at the posted battalion through the head in the system.
- After successful registration, reference data will be sent to the controller or battalion head like GPS Location (longitude & latitude), Body Temperature, and Heart bit rate.
- Then data will monitor the threshold values for Body Temperature, and Heart bit rate.
- To help the soldier, IOT receive & transfer the data to the destined controller in terms of the panic button pressed then Location & longitude will send to the battalion head & in terms of health issues like heart bits, up/down or body temperature increased.

V. CONCLUSIONS

We conclude that a IoT Based Health monitoring and tracking system is designed. The developed system will in real manner help to provide security to our soldiers. By this system, if we can save the life of any soldier then we are supposed to be successful.

VI. FUTURE SCOPE

In the future, we can implement on the field using advanced components assembled on a strip band which can be worn on the arms/chest of the soldier.

- Optical pulse sensor: ROHM BH1790GLC-E2 Biometric Sensor
- Temperature sensor: Melexis MLX90632 miniature SMD thermometer IC

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