**Chapter 1**

**IOT Based Health and location Tracking System**

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**1. Project Overview:**

This system allows to army head office to track location and get health status of solider in the war. We use IOT device to track and get health status of soldier. Our main concern is to provide safety to army solider in the war if anything happen with him . Army soldier wear a IOT based gadget. Existing system are working like that but it is not provide complete web panel for based station and also it did not provide security between IOT gadget and based station. So our main focus is give complete end to end security and web interface for based station.

**2. Project Aim:**

Our work focuses on tracking the location of soldier with secure communication which is useful for control room station to know the exact location of soldier and accordingly they will guide them. Control unit gets location of soldier using GPS. It is necessary for the base station to guide the soldier on correct path if he lost in the battlefield.

**3. Project Objectives:**

Our main objective is to provide safe and secure communication channel between based station and soldier in the war.

Some Others objective as follows:

* Track Location of soldier.
* Get Update of soldier health status.
* Secure Communication Between Solider and Based station.
* Complete Web panel for managing and observing whole war.

**4. Project Scope:**

1. **-Web Panel**
2. Admin can add new soldier.
3. Admin can delete soldier.
4. User can see all soldier.
5. User can See Soldier profile and health status.
6. User can track soldier
7. User can add operation
8. Admin can assign operation to soldier
9. User can complete operation
10. User can detect gadget is on off and identify health status and location
11. User can get Alert from Soldier if he get injured
12. User can show location of soldier in graph
13. User can show health status in graph
14. User can show total operation
15. User can login
16. Admin can add new observer.
17. Admin can see all observer.
18. Admin can see details about observer
19. Admin can delete observer
20. Two user level one is admin other is observer
21. **2-Android App**
22. User can see all soldier and operation
23. User can see soldier location and health status on map
24. User can track soldier
25. User can login
26. **3-Resbery Pi Gadget**
27. User can see his current heartbeat, temperature and location
28. Get help from other solider by pressing button
29. Send current data to based station
30. Login soldier by entering 4 digit key

**5. Problem Statement:**

IOT nodes have communication security problems. In the war soldiers are lost their location and control unit didn’t know the location and health status of soldier. Control unit did not know the current situation of war. In this situation communication between two nodes are very insecure.

**7. Proposed Solution:**

Our system will solve this problem through encryption and provide reliable communication between based station and soldier. Through this system control unit track location , get health status and also make war strategy for the future.

**8. Proposed System Components**

**1**- Web panel for control unit

2- Android app for control unit

3- IOT Based Gadget for soldier

**9. Proposed System Output**

1- Our system provide reliable communication between soldier and based station

2- Based station check health status and location from app and web panel

3- IOT device send properly data to based station

**10. Methodology:**

Our system requirements changing dynamically and risky due new technology

for to this reason we use Xtreme Programming Model for developing our system.

**11- Project life cycle**

1. Requirements Analysis (4 weeks )
2. Design (4 weeks )
3. Development (12 weeks )
4. Testing (2 weeks )

**12- Software/Tools Requirement:**

1. Android Studio for Android App
2. Sublime for Web panel
3. Rational Rose for Design
4. Raspberry Pi IOT based Gadget

**13- Language**

1. Kotlin
2. Node Js and Angular
3. Python

**14- Hardware:**

1. Temperature Sensor
2. Heart Beat Sensor
3. Humidity Sensor
4. Arduino board
5. Battery
6. 4X4 Matrix Keypad
7. GSM Module
8. GPS Module
9. Display Screen
10. Android Mobile

**15- Deliverable**

1. Complete Documentation
2. Android App s
3. Web panel
4. IOT Device

**16**- **Literature Review**

1. **IOT Based Soldier Navigation & Health Indication System**

This system includes Wi-Fi module that establishes a base station network and collects important information about soldier health parameters (using temperature sensor and pulse sensor) and location at the base station. GPS monitors soldier's place in the war as well as health parameters that provide soldiers with protection. The temperature, longitude, latitude and BPM output values are observed on the soldier unit's LCD screen. This system is only for observing health status. and current location of soldier on Map. This include Wi-Fi module which is not good for long range internet connectivity. It works in local area network. [1]

1. **Soldier Health and Position Tracking System using GPS and GSM Modem.**

This system includes all functionalities that are discuss in above system except Wi-Fi module. This include GSM module which is good for long range internet connectivity. It works in wide area network. This system is only observing current location and health status of soldier through message on mobile. [2]

1. **Health Monitoring and Tracking System for Soldiers using Live track Application**

This system consists of two main functions, such as data acquisition from hardware and data transfer through cloud computing. The LM35 temperature sensor, the toxic gas detector, the blood pressure sensor, the accelerometer oxygen level and the GSM to continuously monitor the health status of the soldier are used to relay all information from the above sensors. GPS is used to assess location and orientation in real time. Data from sensors and GPS receivers are analysed and stored using the Arduino (ATmega328P) computer. [4]

1. **IoT implementation using secure communication protocols**

In the near future, everything is likely to be fitted with tiny built-in devices that can connect to the Internet. This skill is useful in different domains in our daily lives. Nevertheless, the more IoT systems are deployed, the greater the risk to our information system. Nonetheless, IoT's non-negligible number of devices is victim of security threats, such as denial of service and replay attacks, due to their limited resources and lack of defence methods. This type of attack leads to poor and unreliable performance of sensing applications. In more serious cases, leakage of information from such tiny devices could expose sensitive data to the outside. This paper summarize the challenges to be tackled by the IoT.[5]

**17- Critical Analysis from Literature Review**

In existing system there are major problem of communication security. [3] Our system provides reliable communication between based station and soldier, and soldier to soldier. We will increase communication security between nodes. We build a complete web panel and android app for based station with new tools and language. We use GSM module rather than Wi-Fi module. Through this system control unit track location, get health status and also make war strategy for the future.

**18- Project Summary**

This system allows the Army Head Office to track the location and to gain a stronger health status in the war. We use the IOT device to track and get a soldier's health status. Our main concern is to provide security for a stronger army in the war if anything happens to it. Army soldier wears a gadget based on IOT. The existing system works like this, but it does not provide a complete web panel for the station, nor does it provide security between the IOT gadget and the station. So our main focus is on putting an end to the security end and the web interface for the station.

**References :**

1. <http://www.ijste.org/articles/IJSTEV4I7037.pdf>
2. <https://www.ijert.org/research/soldier-health-and-position-tracking-system-using-gps-and-gsm-modem-IJERTCONV6IS13079.pdf>
3. <https://www.researchgate.net/publication/273126211_IoT_Challenges_Projects_Architectures>
4. <https://pdfs.semanticscholar.org/ee0c/d29e111ba766f8e5178be8ad65d4f8e3865c.pdf>
5. <https://www.researchgate.net/publication/329170328_IoT_implementation_using_secure_communication_protocols>