HEALTH MONITORING AND TRACKING SYSTEM

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Abstract

The project is on internet of things which is based on health monitoring and tracking system for soldiers the system can be mounted on the body of the solider so that it could easily track the health status as well as position of the solider through GPS tracking this information is transmitted to the control room and they observe this all in software where the value is updated. No need to go on the filed, Higher reliability, Low cost, Fast and efficient When the above system once's get completed then it would help to track the health status of the solider it would also track the position of the soldier on the battlefield it is very useful for them to know all the health status and position of the soldier. To save our soldiers and our nation this is the process to save them all.

Keywords: GPS tracker, health monitoring, tracking system, transmitting.

1.1 INTRODUCTION

The best and main part in our nation is our security. Many of the enemy people are planning to clean our nation by killing our people and to stole everything from us. They are planning to keep a bomb, killing people by gunshots and whatnot to stop all this things our nation has been planed to create a new form which is know as soldier. Who are ready to give their life and take the lives of our enemy in the war to save us from them and should live a fearless life and to be their safety they use many of the technology using the satellite like GPS tracking, GSM modem, satellite devices, walkie talkie and whatnot to their security and to save their lives we have been created this system of technology using IOT which is known as health monitoring and tracking system.

1.2 WHY IS IT IMPORANT?

It is important as there are risking their lives only to save us so, now its our turn to save their lives with in time they have we cant go their and save but we have a updated and advanced technology where we can make a different services to check their health updates and electronic devise to them in which they can use in the war like electronic bombs, electronic gadgets, electronic watches, and so on in the same way this object is used to check their health condition as well as their pulse rate and temperature when they are in life and death border by knowing his health condition we be gonna in alert and could save their live on time.

1.3 WHY IS IT NOT INVENTED BEFORE?

As the technology goes on advanced at the same time new technology is also get developed as new software are getting updated at the same time even in the reality lives new technology is also updated when this object system is taken into the war whatever the update is there in the war it is shown in the software system which is placed in the base station by seeing this updates on time to time the soldiers who are staying in the headquarters gets alert for their emergency time and save their lives. It has been not inverted before due to not advance technology and not even getting this idea to anyone else but during the war they are losing many lives because of the only reason that they were not on time so they have thought to make this device and with this they has been in benefit way at least they are saving some of the life but still research is going on for this device to clear the drawbacks so that it would be perfect useful for our soldier.

2.1 LITERATURE REVIEW

At first Nikil patil and dr. Brijesh iyer has been thought of this device as they thought they start working on it and has been successfully made the device but it has been rejected due the reason that the communication was established between the soldier and the server which are placed in the base unit. They again started to research on the device to find out the problem but they will failed. After knowing the rejected reason dr. R.Shaikh has find the solution that communication was established due the reason that there was not GSM modem for transmitting the data or communication the GSM modem takes the net from the satellite and helps to transmit the date and it is very useful in the telecommunications too.

After being created the device still it was difficult to work on it due to the one reason that is they were unable to find the position of the soldier it was very tough for them to find the body of the soldier then S.Dixit and A.Joshi got the solution for this drawback they thought to also add the GPS tracking so that with the help of the satellite we can check the position of the soldier and it was succeed. When ever they fallen sick in the battlefield and it was tough to take the temperature and medical kit on the battlefield so S.Rajeshwari and R.kalaiselvi has invented the temperature sensor using the LM35 they had used the LM series for checking the body temperature

3.1 HARDWARE COMPONENT

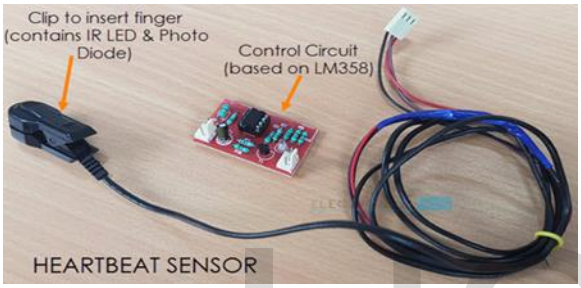
1. lcd
2. power supply
3. GSM module
4. GPS tracking module
5. temperature sensor
6. pulse rate sensor
7. danger switch

3.2 SOFTWARE COMPONENT

1. ubidots software
2. KEIL version software
4. c programming

4.1 PULSE RATE SENSOR

The pulse rate kit contains a clip from which it receives the module. It is used to monitor the heart beat of the soldier to check whether it is increasing or decreasing with the help of this we can be known whether it is emergency. The result of the pulse rate is shown in lcd the pulse rate sensor contains three unit in which one is connected to supply first unit is connected to power supply and second unit is connected to ground and third one is connected to pin number 4.



[FIG1: PULSE RATE SENSOR]

4.2 TEMPERATURE SENSOR

LM35 is used to made it. The LM series are integrated circuit temperature sensor whose output voltage is linearly proportional to the Celsius temperature. In this it contains of three units and they are first is connected to power supply middle is connected to output and third one is to ground. It is used to check the body temperature of the solider.

[FIG2: TEMPERATURE SENSOR]

4.3 GPS MODULE

Global position system is the full abbreviation and the name itself says that it is use to track the position of the solider. It is a satellite based system that uses satellite and ground stations to compute its position. It receives or takes the signal from satellite. To receive data it takes from at least 4 satellites.

[FIG 3: GPD MODULE]

4.4 GSM MODULE

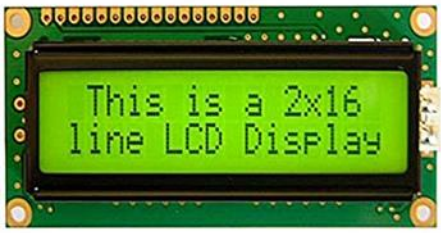
The full abbreviation of GSM is global system for mobile communication the name itself says that it is used for transmitting mobile voice and data services. It is digital cellular technology it operates on the

communication bands 900mhz and 1800mhz. it accepts standard in telecommunication.

[FIG 4: GSM MODULE]

4.5 LCD

It is display device which is made up of a liquid crystal and it is arranged in front of the light source or reflector. It is used to display the value of sensors. It is a 16 pin IC. Displays only 32 characters.



[FIG 5: LCD]

4.6 POWER SUPPLY

It supplies the voltage to the system and it gives 12volts and 5 volts the power supply is connected to the GSM module.

[FIG 6: POWER SUPPLY]

4.7 DANGER SWITCH

Danger switch is used to send a signal of emergency to the base station with the help of that signal all the people who are there in the base station gets alert with this signal.

[FIG 8: DANGER SWITCH]

5.1 KEIL COMPILER

Keil micro version is an integrated software that to be run on embedded system. It allows all the software to write the program is assembly or c-programming language. Language and the software to be simulated on a computer before being loaded onto the microcontroller.

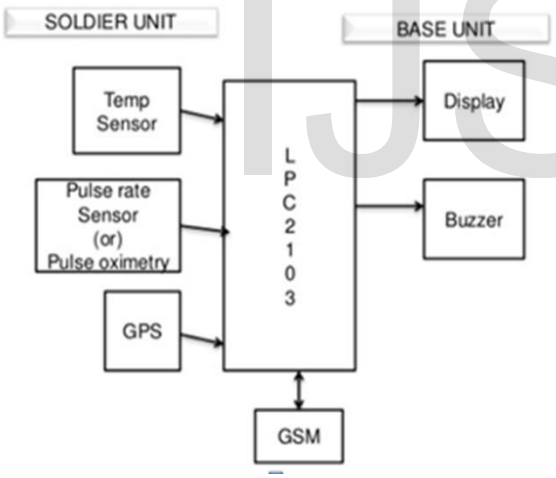
5.2 C-LANGUAGE

C is a general purpose procedural imperative computer programming language. It was developed by Dennis M.Ritvhie in 1972. Easy to learn and produces efficient program. It is compiled on variety of computer platforms.

5.3 UBIDOTS

Ubidots is the software where we could find the position and temperature and location of the solider the people who sits in the base station could track the solider through this software. Program gets simulated and even the hardware system so that value gets easily updated on this software.

6.1 BLOCK DIAGRAM

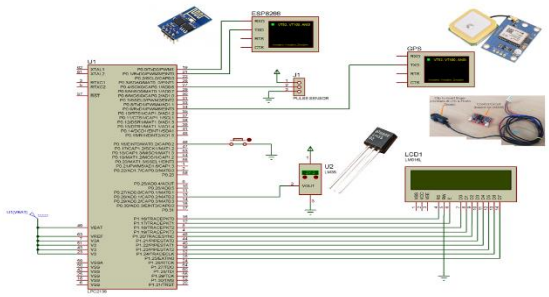


[FIG 9:BLOCK DIAGRAM]

6.2 EXPLANATION

In this system it contains two units one is solider unit and other one unit is base unit. Solider unit contains all the sensor that is temperature sensor that is used to check the body temperature of the soldier and other sensor is pulse sensor that is used to check the pulse rate of the solider and also it contains the GPS module which is used to track the position of the soldier and also it contains GSM module which is used to transmit of data of communications with the help of the GSM we could able to contact with the base station and other unit is base station the head of the security agents observe everything thing from this through software it contains of all advance technology and also the buzzer when the soldier press the emergency switch then buzzer start ringing with the help of this buzzer the people who are present in the base station gets alerts. And with the advance technology the people observers the health status of the soldier even its position in ubidots software.

7.1 CIRCUIT DIAGRAM



[FIG 10: CIRCUIT DIAGRAM]

7.2 EXPLANATION

The above figure describes the connections of the system all the sensors are connected to the arm 7 microcontroller and in every sensor it consists of the three units in which it is connected to the ground and power supply and the end of the unit of the sensors are connected to the pins of the arm 7. As we can see from the figure that ESP8266 microcontroller of receiver unit is connected to the pin p0.0 and the transmit unit is connected to the pin p0.1. pulse rate sensor first unit is connected to power supply and the second unit is connected to p0.4 and the third unit is connected to the ground. In GPS tracking system of transmit point is connected to pin p0.9. in power supply it is connected to the pin p0.16. and the temperature sensor is connected to the pin p0.28. the lcd display only read and write unit is connected to ground but other units are connected to the module from pin p1.16. thus this are connections of the system from this we gonna et the output of the system.

8.1 PROGRAM

```
#include <lpc214x.h>


#define rs 0x00010000
      //P1.16
#define en 0x00020000
      //P1.17
#define sw 0x00010000
      //P0.16


#define                          tid
"60ae1efd1d847236093713b7"
#define                          pid
"60ae1f031d847237b939bfcb"



unsigned char lat[12],lon[13];
void delay(unsigned int i)
{
       unsigned int j;
       for(;i>0;i--)
         for(j=0;j<15000;j++);
}
void cmd(unsigned char z)
{
       unsigned int k;
       k = z<<18;
       IOPIN1 = k;
       IOCLR1 = rs;
       IOSET1 = en;
       delay(3);
       IOCLR1 = en;
       delay(3);
}
void disp(unsigned char z)
{
       unsigned int k;
       k = z<<18;
       IOPIN1 = k;
       IOSET1 = rs | en;
       delay(3);
       IOCLR1= en;
       delay(2);
}
void dispstr(unsigned char *s)
```

```
{
	while(*s)
		disp(*s++);
}


void lcd_val(unsigned int x)
{
	unsigned int a,b,c;
	a = x / 1000;
	b = x % 1000;
	c = b;
	b = b / 100;
	c = c % 100;
	x = c;
	c = c / 10;
	x = x % 10;
//disp(a|0x30);
	disp(b|0x30);
	disp(c|0x30);
	disp(x|0x30);
}



void tx(unsigned char x)
{
	U0THR = x;
	while(!(U0LSR & 0x20));
}


void txstr(unsigned char *s)
{
	while(*s)
		tx(*s++);
}
void txstrln(unsigned char *s)
{
	while(*s)
		tx(*s++);
	tx(0x0D);
	tx(0x0A);
}


unsigned char rx()
{
	unsigned char x;
	while(!(U0LSR & 0x01));
	x = U0RBR;
	return x;
}

unsigned char rx1()
{
	unsigned char x;
	while(!(U1LSR & 0x01));
	x = U1RBR;
	return x;
}
void dispnum1(int x)
{
	unsigned int c;
	c=x;
	c = c / 10;
	x = x % 10;
```

```
        disp(c|0x30);
        disp(x|0x30);
        delay(100);
}
void txnum1(int x)
{
        unsigned int c;
        c=x;
        c = c / 10;
        x = x % 10;
        tx(c|0x30);
        tx(x|0x30);
        delay(100);
}
void txnum2(int x)
{
        unsigned int a,b,c;
        a = x / 1000;
        b = x % 1000;
        c = b;
        b = b / 100;
        c = c % 100;
        x = c;
        c = c / 10;
        x = x % 10;
        tx(a|0x30);
        tx(b|0x30);
        tx(c|0x30);
        tx(x|0x30);
        delay(100);
}


void dispfloat(float f)
{
 int i;
 i=f;
 dispnum1(i);
 disp('.');
  f=(f-i);
       f = f * 1000;
  i=f;
  dispnum1(i);
}


void txfloat(float f)
{
 int i;
 i=f;
 txnum1(i);
 tx('.');
  f=(f-i);
       f = f * 10000;
  i=f;
  txnum2(i);
}


void  upload(unsigned  int,unsigned
char *);
void uploadgps(void);


void gps(void)
{
       unsigned char x,i;
back1:
              x = 0;
              while(x!='$')
```

```
{
	x = rx1();
}
x = rx1();
if(x!='G')
{
	goto back1;
}
x = rx1();
if(x!='P')
	goto back1;
x = rx1();
if(x!='G')
	goto back1;
x = rx1();
if(x!='G')
	goto back1;
x = rx1();
if(x!='A')
	goto back1;


for(i=0;i<11;i++)
{
	x = rx1();
}
for(i=0;i<12;i++)
{
	lat[i]=rx1();
}
x =rx1();
for(i=0;i<13;i++)
{
	lon[i]=rx1();
}
cmd(0x01);
for(i=0;i<12;i++)
{
	disp(lat[i]);
}
cmd(0xC0);
for(i=0;i<13;i++)
{
	disp(lon[i]);
}
delay(1000);
}

int main(void)
{
 unsigned                    int
i,count,val,x,p,hbt,co[10],se;

 unsigned char ip[10];
  float volt,fah;
 PINSEL1 = 0x01000000;
//P0.28 acts as ADC0.1
 count=0;
 IODIR1 = 0x03FF0000;
 cmd(0x38);
 cmd(0x01);
 cmd(0x06);
 cmd(0x0E);
 cmd(0x80);
 delay(1000);


 PINSEL1 |= 0x01000000;
 AD0CR = 0x00200000;
```

```
        PINSEL0 = 0x00050005;
        U0LCR = 0x83;
        U0DLL = 0x62;
        U0DLM = 0x00;
        U0LCR = 0x03;
        U1LCR = 0x83;
        U1DLL = 0x62;
        U1DLM = 0x00;
        U1LCR = 0x03;
        dispstr("Health
Monitor..");
      txstr("AT");
        tx(0x0D);
        tx(0x0A);
        delay(200);
back:
        txstr("AT+CWMODE=1");
        tx(0x0D);
        tx(0x0A);
        delay(200);


        txstr("AT+CIFSR");
        tx(0x0D);
        tx(0x0A);


        x = 0;
        x = rx();
        while(x!='.')
        {
               x = rx();
        }


        for(i=0;i<10;i++)
        {
               ip[i]=rx();
        }
        cmd(0x01);
        dispstr("IP Address: ");
        cmd(0xC0);
        for(i=0;i<10;i++)
        {
               disp(ip[i]);
        }
        delay(1000);
        if(ip[0]=='0')
        {
               cmd(0x01);
               dispstr("WiFi    Not
Connected");
               goto back;
        }


        cmd(0x01);
        dispstr("WiFi Connected");


        txstr("AT+CIPMUX=0");
        tx(0x0D);
        tx(0x0A);
        cmd(0x01);
        while(1)
        {
               se = IOPIN0;
               se = se & sw;
               while(se==0x00)
               {
                      cmd(0x01);
```

```
dispstr("Emergency...");
                        gps();
                        uploadgps();
                        se = 0x01;
                }
                se = 0x00;


                cmd(0x01);
                dispstr("TEMP:");
     p = 0x00;
                AD0CR |= 0x01000002;
                while(p==0x00)
                {
                        p = AD0DR1;
                        p   =   p   &
0x80000000;
                }
                val = AD0DR1 >> 6;
//              cmd(0xC0);
                val = val & 0x03FF;
//              lcd_val(val);
                cmd(0x85);


                volt = (val * 3.3);
                volt = volt/1023;


                volt = volt * 100;
                volt +=7;


                lcd_val(volt);
                cmd(0x8A);
                fah=(volt*9);
                fah = fah / 5;
                fah = fah + 32;
                lcd_val(fah);
                disp(' ');
                disp('F');
                upload(fah,tid);
                delay(100);


        se = IOPIN0;
                se = se & sw;
                while(se==0x00)
                {
                        cmd(0x01);
dispstr("Emergency...");
                        gps();
                        uploadgps();
                        se = 0x01;
                }
        onceagain:
        for(i=0;i<10;i++)
        {
                count = 0;
                do
                {
                        x=IOPIN0;
                        x          &=
0x00000010;      //wait for pulse
                        }while(x==0);


                delay(10);
```

```
count=0;
while(x==0x00000010)
{
	x=IOPIN0;
	x &= 0x00000010;
	count++;
	delay(5);
}

while(x==0x00000000)
{
	x=IOPIN0;
	x &= 0x00000010;
	count++;
	delay(1);
}
co[i]=count;
}

se = IOPIN0;
se = se & sw;
while(se==0x00)
{
	cmd(0x01);
	dispstr("Emergency...");
	gps();
	uploadgps();
	se = 0x01;
}

hbt = 0;
for(i=0;i<10;i++)
{
	hbt = hbt + co[i];
}
count = hbt / 10;
if(count>200)
	goto onceagain;

	cmd(0x01);
	dispstr("PULSE RATE:");

	lcd_val(count);
	upload(count,pid);

	for(i=0;i<10;i++)
	{
		co[i]=0;
	}
	delay(50);

	}
}

void upload(unsigned int val,unsigned char *id)
{
	unsigned char z;
	unsigned int x,y;
bac:
	delay(100);
```

```
txstrln("AT+CIPSTART=\"TCP\",\"thi
ngs.ubidots.com\",80");
       z =rx();
       while(z!='L' && z!='F')
       {
              z = rx();
       }
       if(z!='L')
       {
              cmd(0xC0);
              dispstr("Failed   to
Link");
              goto bac;
       }
       cmd(0xC0);
       dispstr("Linked..");
       txstrln("AT+CIPMODE=0");
       delay(10);
       txstr("AT+CIPSEND=");
       if(val<10)
       {
              txstrln("210");
       }
       else if(val<100)
       {
              txstrln("211");
       }
       else if(val<1000)
       {
              txstrln("212");
       }
       txstr("POST
/api/v1.6/variables/");
       while(*id)
              tx(*id++);
       txstrln("/values
HTTP/1.1");
       txstrln("Content-Type:
application/json");
       txstr("Content-Length: ");
       if(val<10)
       {
              txstrln("12");
       }
       else if(val<100)
       {
              txstrln("13");
       }
       else if(val<1000)
       {
              txstrln("14");
       }
       txstrln("X-Auth-Token:
BBFF-
RHnqFWzrgmlZ6oRbd0haOME6yj5l4Y");
       txstrln("Host:
things.ubidots.com");
       tx(0x0D);
       tx(0x0A);
       txstr("{\"value\": ");
       if(val<10)
       {
              tx(val|0x30);
       }
       else if(val<100)
       {
              y = val/10;
              val = val%10;
              tx(y|0x30);
```

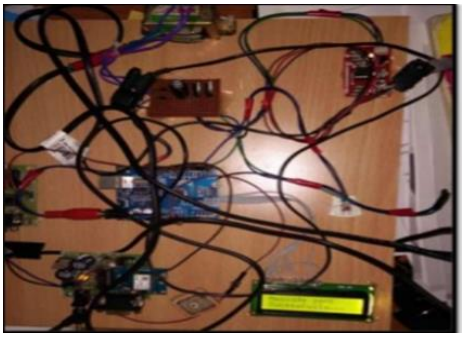
```
		tx(val|0x30);
	}
	else if(val<1000)
	{
		x = val/100;
		val= val%100;
		y = val/10;
		val = val%10;
		tx(x|0x30);
		tx(y|0x30);
		tx(val|0x30);
	}
	tx('}');
	tx(0x0D);
	tx(0x0A);


	cmd(0xC0);
	dispstr("Value Updated   ");
	delay(500);
	txstrln("AT+CIPCLOSE");
	delay(100);
}



void uploadgps()
{
	float
lat1,lat2,lat3,lon1,lon2,lon3;
	unsigned char z;
	 lat1=((lat[0]-
0x30)*10)+(lat[1]-0x30);
	 lat2	=	((lat[2]-
0x30)*10)+(lat[3]-0x30);
	lat3	=	((lat[5]-
0x30)*100)+((lat[6]-
0x30)*10)+(lat[7]-0x30);
	lat3 = (lat3/1000.0);
	lat2	=	((lat2	+
lat3)/60.0);
	lat1 = (lat1 + lat2);
	cmd(0x01);
	dispfloat(lat1);
	delay(200);


	lon1=((lon[0]-
0x30)*100)+((lon[1]-
0x30)*10)+(lon[2]-0x30);
	lon2	=	((lon[3]-
0x30)*10)+(lon[4]-0x30);
	lon3	=	((lon[6]-
0x30)*100)+((lon[7]-
0x30)*10)+(lon[8]-0x30);
	lon3 = (lon3/1000.0);
	lon2	=	((lon2	+
lon3)/60.0);
	lon1 = (lon1 + lon2);
	cmd(0xC0);
	dispfloat(lon1);
	delay(2000);


back:
		cmd(0x01);

dispstr("Uploading...");
		 delay(200);
	z =0;

txstr("AT+CIPSTART=\"TCP\",\"thing
s.ubidots.com\",80");
	tx(0x0D);
```

```
        tx(0x0A);


   while((z!='L')  &&  (z!='F')  &&
(z!='E'))
   {
              z =rx();
   }
   if(z!='L')
     goto back;
        cmd(0xC0);
        dispstr("Linked..");
        txstrln("AT+CIPMODE=0");


        delay(20);
        z=0;
        txstrln("AT+CIPSEND=254");


        while(z!='>')
              z = rx();
        txstr("POST
/api/v1.6/variables/");

txstr("60ae1ef31d847237b939bfca");
        txstrln("/values
HTTP/1.1");
        txstrln("Content-Type:
application/json");
        txstrln("Content-Length:
53");


        txstrln("X-Auth-Token:
BBFF-
RHnqFWzrgmlZ6oRbd0haOME6yj5l4Y");
        txstrln("Host:
things.ubidots.com");
        tx(0x0D);
        tx(0x0A);
        txstr("{\"value\":
10,\"context\":{\"lat\":");


        txfloat(lat1);


        txstr(",\"lng\":");
        txfloat(lon1);
        tx('}');
        tx('}');
        tx(0x0D);
        tx(0x0A);
        tx(0x0D);
        tx(0x0A);
        z=0;
        while(z!='O')
              z=rx();
        cmd(0xC0);

dispstr("Completed");
        delay(1000);
        txstrln("AT+CIPCLOSE");


        delay(130);
              cmd(0x01);
        dispstr("Location
Updated");
        delay(530);
}
```

9.1 WORKING OF THE SYSTEM

First we have to give the connections on the board according to the circuit diagram then we have to create the account on the ubidots software and design our app then we have to write the program on the KEIL micro version software and also should check the errors if the program shows lot of errors then it is tough to get simulated with the system when you clear all the errors then with the help of the USB cable connection we can simulated the program with the system we have to simulate the program in ubidot software then remove the USB cable hence the program is fixed into that after that switch on the power supply give the power to the module thus it shows the temperature on lcd display it also shows the temperature in faherits using the formula (Celsius*9/5)-32 degree faherits then with the help of the clip we can check the pulse rate and to find out the location we have to press the danger switch then location is trace and location is shown in the form of longitude and latitude and whatever the values are shown in the display that gets updated on the software so that the people who are in base station can see the health status and position of the solider.

9.2 PROJECT RESULT



[FIG 11: RESULT]

10. Advantages

1. sophisticated security
2. no need to go on filed
3. higher reliability
4. low cost
5. fast and efficient
6. mobile number can be changed at the time
7. alert message to mobile phone for remote information

Disadvantages

1. at some places if there is no GSM module networks then it is tough for communication.
2. When the device will be fallen down from their body then it is will be tough to find them.

11. FUTURE SCOPE

The developers are thinking to make it more advance by inter connecting a camera to the module that takes the photograph of the all the accidents and as well as the plan of the enemy people to the head of the security agent with that they would get alert and provides more security.

CONCLUSION

when the above system once's get completed then it would help to track the health status of the solider and it would also track the position of the solider on the battlefield. It is very useful for them to knew all the health status of the solider who got shot on the filed it gives up to information and also sends all the information to the base station.

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