ABSTRACT:

As the world battles with the effect of COVID-19, organizations and governments are looking for approaches to securely restart worldwide business and neighborhood economies to moderate the monetary effect of the infection. This will affect numerous individuals getting back to their working environments. Notwithstanding, with progressing COVID-19 episodes and the danger of a subsequent wave actually present, the need to keep noticing social removing and contact following will be a significant component in any arrangement for the safe resuming of organizations and functional offices.

For most business pioneers, these contemplations are on the whole new. While structures are intended to help a consistent progression of individuals, hardly any draftsmen might have imagined the requirement for a low thickness of traffic in mutual regions, doorways and ways out, passageways, or other open spaces. The structure, notwithstanding how keen it very well might be, is probably not going to give the vital innovation to help social removing. It tumbles to new answers for give the appropriate response.

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Enter Student Name

CHAPTER -1

INTRODUCTION

1.1 Preface
The expression "Social distance " is presently used to depict the safety measures that society needs to consider to restrict or forestall the danger of transferable illnesses like COVID-19. Numerous researchers accept the episode of another infection is inescapable eventually; it's not possible for anyone to say without any hesitation how extreme or common it could be. The new typical, in this way, is to have careful steps prepared for arrangement. For infections that assault the respiratory framework, for example, COVID-19, keeping an actual separation is a successful method of

forestalling its spread, and contact following is a viable method of containing the spread subsequent to recognizing a flare-up.

1.2 **EXISTING SYSTEM**

In the existing system there is no any electronic gadget which continuously monitors the distance between persons standing in a queue, in front of counters, shops rectangular box with normal distance would be drawn to make people stand at that box hence safety distance could be achieved.

The app such as Arogya sethu lists the number of infected persons present in the surrounding area, it works on blue tooth and it has dependent on the users provided information, if users gives wrong info it fails to achieve its aim.

1.2.1   Limitations of existing system

1. Not reliable
2. If users violates the rules intentionally or un knowingly it fails to detect
   If users fail to note the mobile notifications again it causes problemsBelow image shows the various components the proposed will have and the way they are connected with each other to achieve the aim. The components such as development board, range sensor, external battery and buzzer are the key elements required to implement

1.3 PROPOSED SYSTEM

Proposed system is an iot based solution to enforce social distance between the people standing in queue and counter or any premises, the proposed system used rang sensors such as ultrasonic interfaced with microcontroller such as Arduino nano.

It continuously monitors the range and alerts by means of beep sound if any normal distance is violated. It power with 9v battery.

1.3.1 Advantages of proposed system

1. Reliable as it monitors continuously

2. since its electronic device notifies instantly, no delay in the response from system
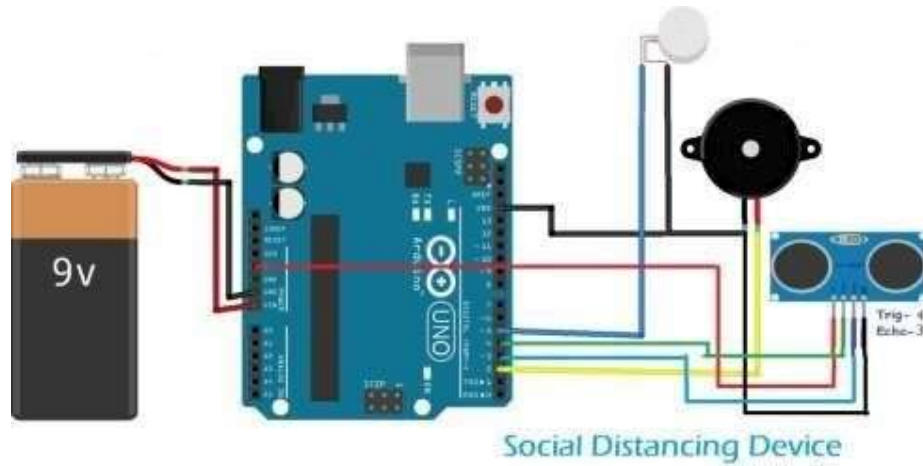
Figure 1: Proposed System Design

CHAPTER 2
SYSTEM SPECIFICATION

2.1 Hardware Specification

Processor	-i3 processor or Higher
RAM	- 2GB or Higher
Hard disk	- 500 GB

Arudino

UNO Board

Ultra sonic

Sensor

Bread board

Jumper wires

Buzzer

2.2 Software Specification

Programming Language   - Arduino Programming language

Operating System   - Windows 7 or Any Compatible

IDE   - Arduino

2.3 Introduction to Programming

In this project to program UNO development board, we are going to use Arduino IDE,in this platform program written for hardware boards is called sketch,to write sketch,knowledge of C,C++ is usefull because this sketch too has similar features with little modifications.

The language has fallowing characteristics

- High-level language
- Structured
- Modular approach ☐ Best suited for communication with hardware.

In c each program includes one more functions' hence it is called procedural programming language. A function can be defined with the fallowing syntax.

<return type><function name>(parameters)

{

      Body of the function.

}

Here return type indicates the type of value being returned by the function, function name can be any valid identifier. Body of the function includes one or more statements.

Example:-

```
intiseven( intnum )
{ if( num%2 == 0 )
        return(1); else


        return(0);
}
Basic datatypes used in the C are
    1.  int
```

2. float

3. double

4. char

All whole numbers irrespective of sign are known as integers, fractional numbers irrespective of sign with 6 digits decimal points are known as floats, fractional numbers irrespective of sign with 16 digits decimal points are known as doubles. In Arduino we have 2 user defined functions called setup() and loop(), setup() function gets called only once we code is launched to device and loop() function gets called continuously.

Arudino UNO board

This kit fetches the information form sensors and converts the analog data to digital; these data get processed using C language and uploaded to server using Wi-Fi configured network.

Functional Requirements

Following are the functional entities observed in the project

Sensors

Are the transducers used to fetch information like temparature, humidity and voltage; they operate at low voltage and help to fetch information.

Arudino UNO board

This kit fetches the information form sensors and converts the analog data to digital; these data get processed using C language and uploaded to server using Wi-Fi   configured network.

Non Functional Requirements

Correctness:

In this project care is taken by means of business rules to ensure only valid data is accepted using appropriate sensors

Reliability:

The proposed project works well in all environments, its being tested for various scenarios

Robustness:

The code takes care to deal with unexpected cases by means of alerts

Maintainability:

Project works fine with the given requirements, new requirements could be done with the assistance of developer.

Portability:

This application works on all platforms irrespective of operating system and machine details.

CHAPTER -3

3.1 FEASIBILITY STUDY

Feasibility study is a study of project where it will verify whether the projected project is technically and economically possible or not. In feasibility study we analyses the` project to determine the ability to complete the project successfully with all the feasible cost and technical services. Feasibility study main goal is analyzing the entire feasible test for economical and operational and function feasibility so that the proposed project cost will be not much expensive.

Feasibility study is a decision making of project documentation where it will provide idea to perform the task by using this feasibility report. It also provides the economical and all the technical cost and resources we needed to perform our task to propose our project. Feasibility study also used for identifying the scope of our project.

Feasibility study is over all examination of project strength and weakness of project and required cost to develop our project and also it will provide the problems available in the offered system and what features we need to include in the existing system to overcome from the problem of existing system. The feasibility study as follows

- Technical Feasibility
- Operation Feasibility
- Economic

3.2 Technical Feasibility

The technology feasibility to the proposed system could be summarized as below.

Data storage

Data read form sensor is fed to GPIO, which converts analog data to digital using Analog to digital converts, which are built facility available in the board.

Data processing

Data read from sensors is processed using aurdino programming techniques, it supports both procedural and object oriented philosophy.

Library

To read data from sensor we are going to use a library called NeWping.h, it has built in functions to read the data from sensors, only we need to set Trigger and echo pin along with maximum distance.

Operational feasibility

The device operates with minimum voltage of 5v, board is capable of handling input voltage of 12 v with built in regulator where as sensor needs max of 5v to operate properly

3.3 Arduino IDE

In this project this IDE is used to write, test and deploy C code to hardware circuit , program written using this IDE are called as sketch, each sketch is written in C or C++, this ide allows to communicate with the circuit boards connected to USB port of the development computer.

The sketch can be compiled and loaded to device connected to the pc, if code has any errors they get displayed for users reference.

CHAPTER 4

SYSTEM DESIGN
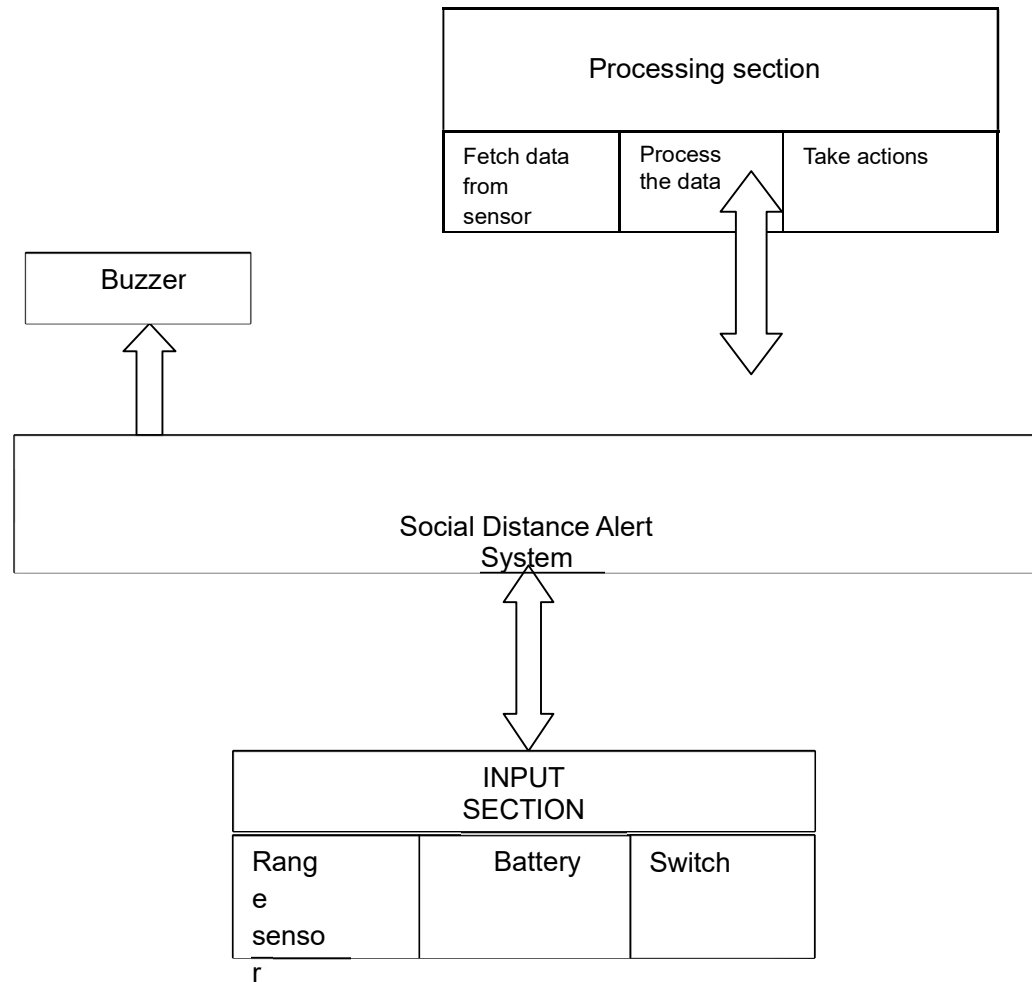
4.1 System Perspective

Figure 4.1 Architecture diagram

Above diagram shows various functional units being used in the project, it has sections like input, processing and server, input makes use of sensor, processing is done programmatically and action is taken based on the predefined conditions
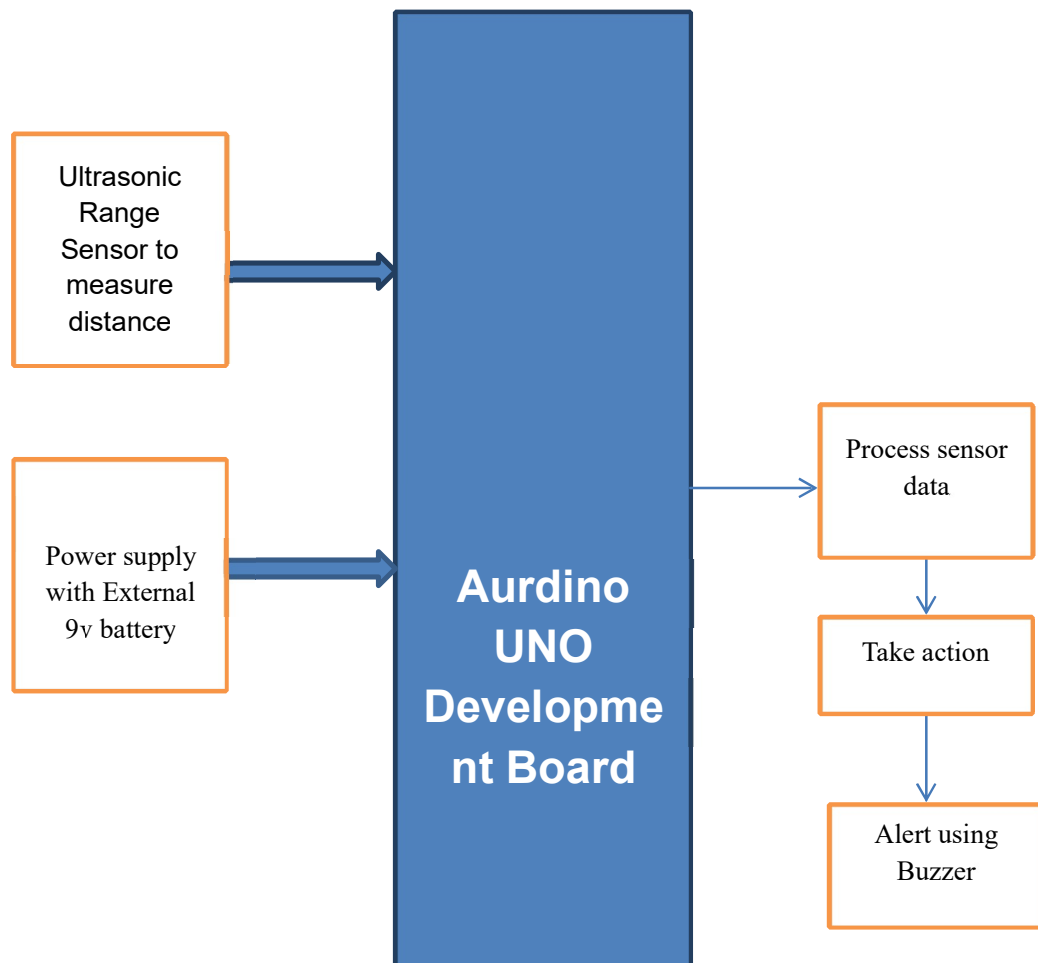
4.2 Context Diagram

Fig 4.2 Context diagram

Above diagram shows various building blocks used in the project by means of Context diagram. Range sensor also known as ultrasonic sensor is the input device which continuously monitors for the objects in front of it by sending sonic waves, the read

information is processed at arduino board at loop function, based on the read information and business logic devices such as Led and Buzzer are controlled.

CHAPTER 5

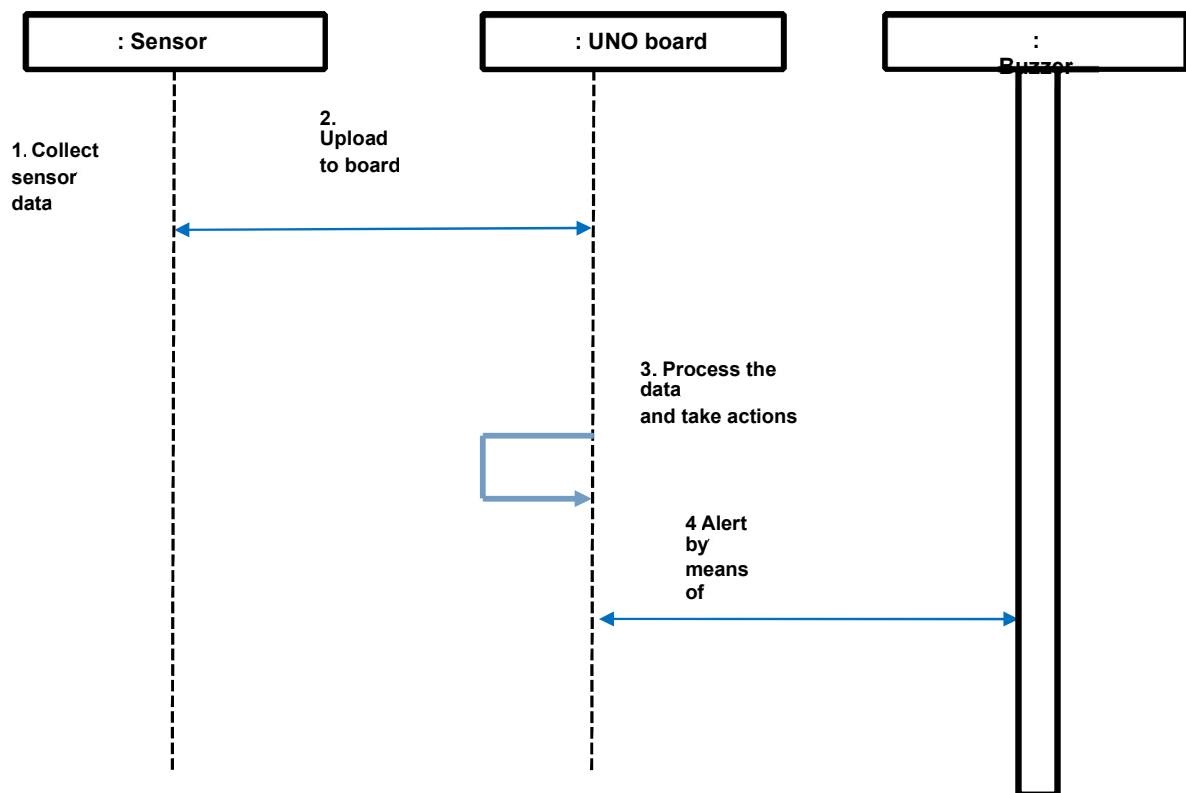# DETAILED DESIGN

5.1 Sequence diagram

Fig 5.1 sequence diagram

Above diagram shows various series of actions being carried out according to timeline.

As diagram indicates information fetching is the initial task system supposed to do, later

it get processed at board using programming technique and based on the values alerting

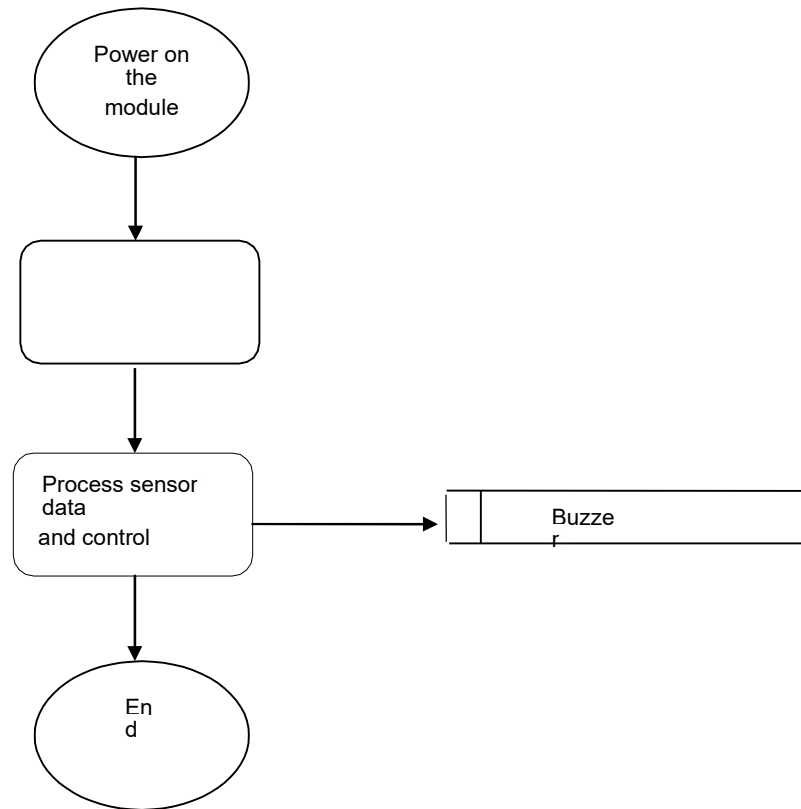is done

5.2 Dataflow diagram

Fig 5.2 Dataflow diagram

Above diagram shows the various processes and respective external entities being used, the symbol oval represents the process and rounded rectangles shows tasks to be done and half closed rectangles indicate the external entities being referred in the proposed prototype. Soon after supplying power to module it starts working and performs the desired task
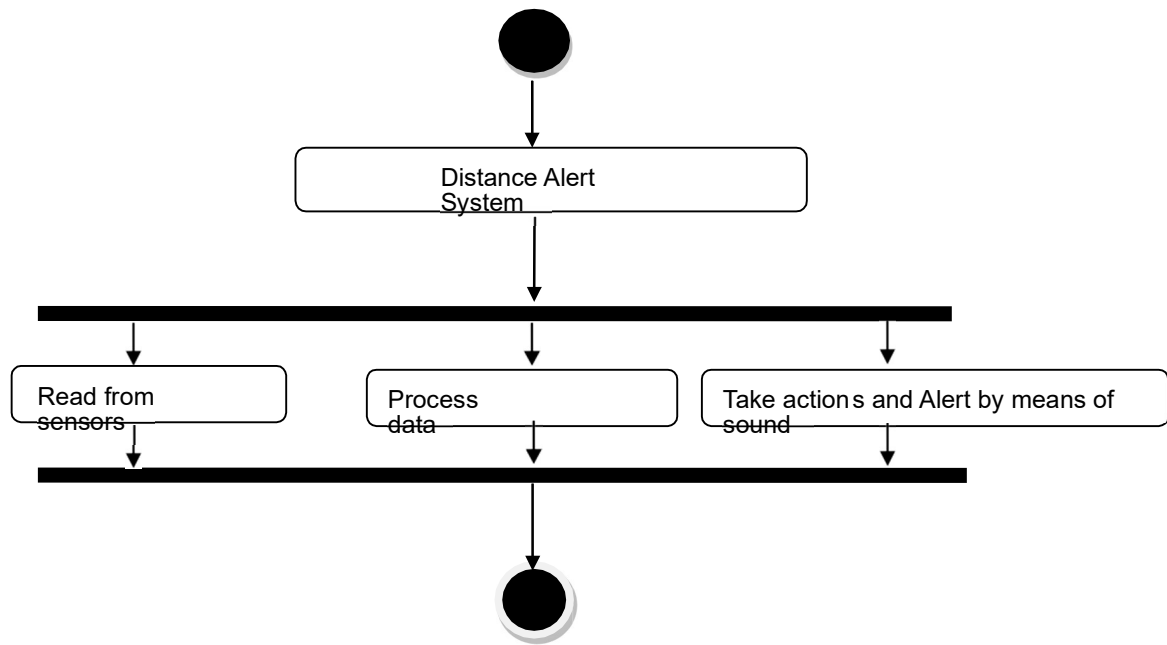
5.3 Activity Diagram

Fig 5.3 Activity diagram

Above diagram shows the various activities being carried out to implement proposed project. The module called distance alert system makes use of above said processes to implement the task.

CHAPTER 6
IMPLEMENTATION

6.1 Algorithm and coding used in the project

6.1.1 Algorithm for reading Range

Step1: Configuring the Range sensor for reading values

Range sensor will have 4 pins, V_{CC}, GND ,Trigger and Echo, connect V_{CC} to 5V, GND to ground Trigger to 11 and Echo to 12 of UNO board. And turn on the kit, following steps should be followed to read the values.

Function ReadDistance( )
Begin

Value=ReadValues(pin number)

process(value) IntroduceDelay()

End of function

A function needs to be defined for reading values of range sensor with an average delay of 1 or 2 seconds. The read value must be processed according to business rules

Algorithm for coding using IDE Step

1:

Launch Arduino IDE

Step2:

Include all necessary header files

Step 3:

Define constants

Step 4:

Within setup () method initialize pin configurations
Step 5:

Read sensor data from GPIOS , define this task in loop method as this method gets

called repeatedly. **Step 6:**

Using digital write methods control the devices

Step 7:
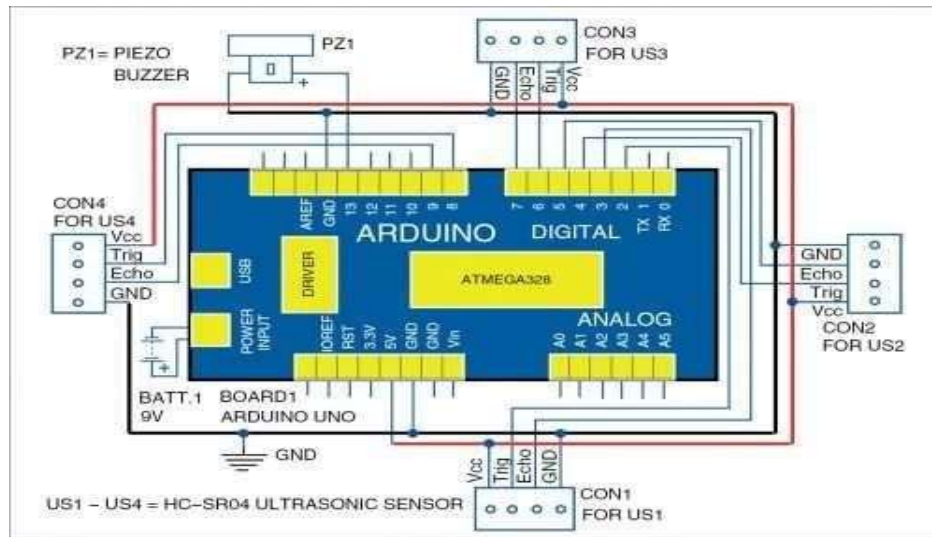
Close connection.

6.2 Modules

Figure 6.2.1 proposed system circuit diagram

The above circuit diagram shows the various components being planned to use in the proposed project, it has ultra-sonic sensor which sends sound waves continuously and measures the time taken by waves to return after having hit with any obstacles. Based on the time taken and frequency distance is measured.

Microcontroller is programmed to continuously read information from sensors and alerts the users when distance is violated. To alert users buzzers are activated.
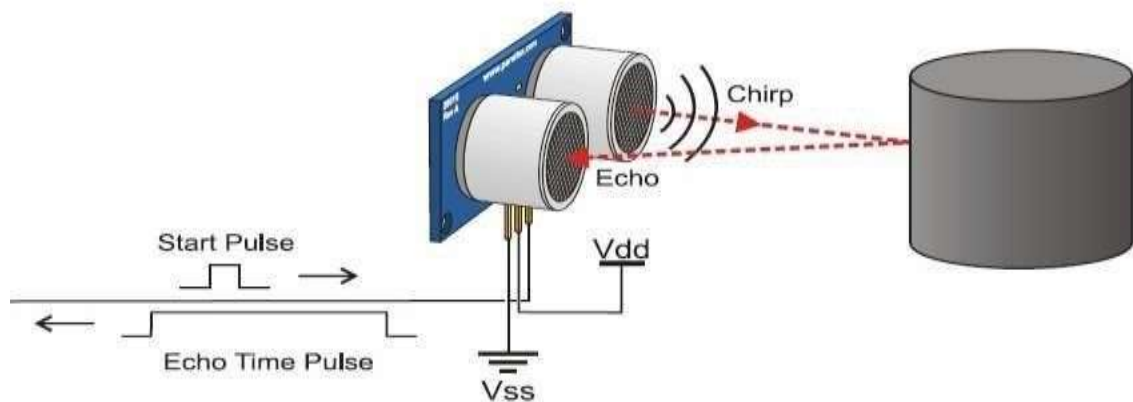
Ultrasonic Sensor
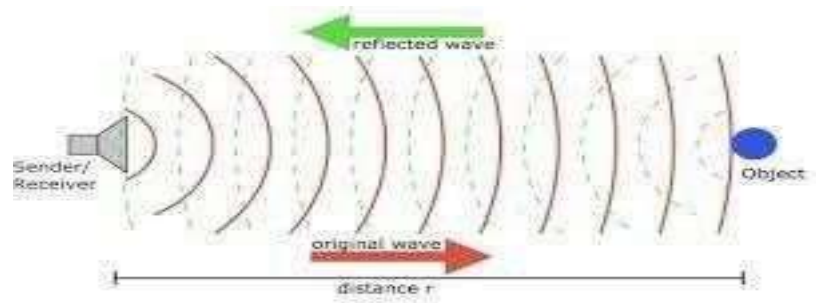

Fig 6.2.2 -Ultrasonic sensor

Fig 6.2.3-Ultrasonic sensor sending and receiving signals
through waves

The above diagrams shows the working principle of range sensor, it has two sections i.e transmitter and receiver , transmitter sends the sound waves over air media, these waves hits the in front object and gets back, returned signals received by the receiver, the time taken by the waves during transmission and frequency are used to measure the range.

Jumper wires

Figure 6.2.4: Jumper wires

These are things we are going to use in the project for connection purpose, we can get to see 3 types of wires like male to male, male to female and female to female. Using them we can establish connection between different components easily without need of soldering.
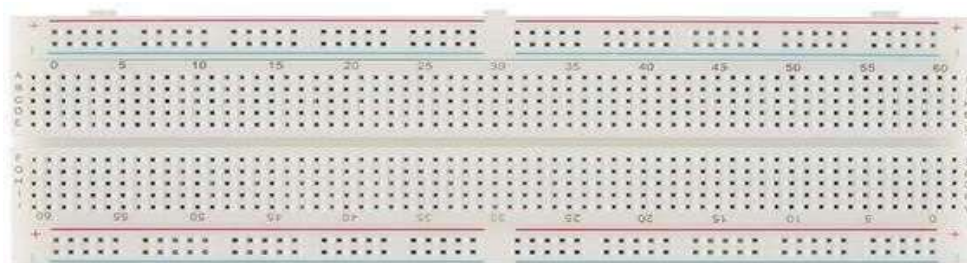
Bread board

Figure 6.2.5: bread board

This device is used to make circuit connections without soldering, it has metallic body with soldered plate, it has holes for making connections.

Buzzer

Figure 6.2.5: bread board

Buzzer is an electronic device which makes sound when energy is supplied
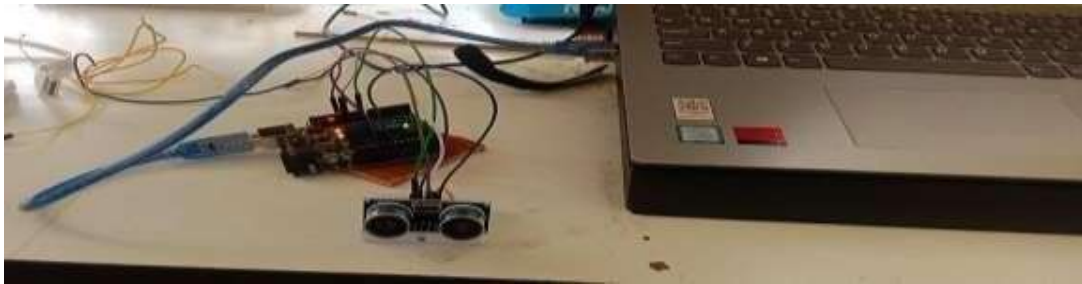
6.3 Screenshots of module

Figure 6.3.1: prototype of proposed model
Above image shows various components being connected to implement the proposed project, it has Uno board, range sensor and tested by connecting to USB port of laptop

Figure 6.3.2: Person standing in front of sensor

6.4 Coding

```
const int pingTrigPin=A4;
const int pingEchoPin=A5;
int led=13; //Buzzer to PIN4
int buz1=9; void setup()
{
  Serial.begin(9600);
pinMode(led,OUTPUT);
  pinMode(buz1,OUTPUT);
} void
loop()
{
  long duration,cm;
pinMode(pingTrigPin,OUTPUT);
digitalWrite(pingTrigPin,LOW);
delayMicroseconds(2);
digitalWrite(pingTrigPin,HIGH);
delayMicroseconds(5);
digitalWrite(pingTrigPin,LOW);
pinMode(pingEchoPin,INPUT);
duration=pulseIn(pingEchoPin,HIGH);
cm=microsecondsToCentimeters(duration);
if(cm<=50 && cm>0)
  {
    int d=map(cm,1,300,10,1000);
digitalWrite(led,HIGH);
digitalWrite(buz1,HIGH);
delay(50);    digitalWrite(led,LOW);
digitalWrite(buz1,LOW);
```

```
    delay(d);
}
  Serial.print(cm);
  Serial.print("cm");
Serial.println();
delay(40); }
long microsecondsToCentimeters(long microseconds)
{
  return microseconds/29/2;


  }
```

CHAPTER 7 SOFTWARE TESTING

The procedure of executing system with the target of finding error is outlined as testing. It can also be defined as the process that defines, isolates, subjects to rectification of defects, and so that the customer satisfaction is reached at last with the assurance of the system is free from defects.Software testing is a very important element of the quality assurance and it represents the SRS, designing, coding and implementation of the system proposed.

7.1 Levels of testing:

☐ Test Planning:☐

Test plan is the document that gives the information regarding the procedure that is to be followed in performing various tasting on the whole application.

This document involves scope and objectives of the testing, areas that are to be tested and areas that should not be tested, scheduling of resources available, the area that need to be automated and various tools that are used for testing. ☐ **Test Development**:☐

Test development involves development of test cases and their procedural preparation i.e. description of the developed test cases.

Types of testing:

Various types of testing that are done on the system are as follows:

i.   **Unit testing**
ii.   **Integration testing**
iii. **System testing**

Unit testing:

As the name itself says, this type of testing is done on small units of the system. A part of the system is considered as a unit and its testing is done. If as an example, login page considered; the user or the administrator can enter into their respective home pages only after giving the valid username and password. This part of validating a system, by considering Login as a unit can be said as a unit testing.

Integration testing:

This part of testing deals with the testing procedure. It involves, testing of various integrations of several units. It checks whether the system is functioning correctly when two or more units are integrated together. This part of testing gives information about order of arrangements of various units, integrating modules, systems, sub- systems and the entire system as a whole.

System testing:

This testing technique deals with the process of testing the system as a whole. At the end of each project, all defects are removed and the interface errors are uncovered in order to achieve the good functioning of the whole system. This testing technique can be called as the final part of whole testing process.

7.2 Test cases:

MODULE	GIVEN INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT	REMARK
Fetching sensor information	Range sensor is connected to PIN no 11 and 12 of UNO board	Should fetch range of obstacle	Fetches range	Tested OK
Fetching range and alerting if distance is violated	Range sensor is connected to PIN no 11 and 12 of UNO board and Buzzer is connected to pin no 7	Should alert by means of buzzer sound if distance is less than 100 cm	It does alert if distance is violated	Tested OK

CHAPTER 8
CONCLUSION

To diminish the spread of COVID-19 and the related disturbance, it is expected to uphold working environment social removing where conceivable and empower robotized contact following in circumstances where social separating is incomprehensible. The little size and low force utilization of present day sensors and incorporated radios mean it's currently conceivable to make refined arrangements that join range-finding with information logging, network interfacing, and locally available investigation to help the sort of computerized contact following highlights now essential for more secure work environment collaborations.

In this project an attempt is made to develop an electronic gadget which helps to achieve social distance in commercial as well as personal use.

FUTURE ENCHANCEMENTS

1. The project can be improved further by implementing fallowing details

2. Industry standard sensors could be used to cover distance from multiple angles

3. Wearable device like band could be made

Appendix A

BIBLIOGRAPHY

BOOKS

- Kevin Tatroey -- Programming PHP(3rd Edition)

- W.JasonGlimor --Beginning PHP and MYSQL (Fourth Edition)

- BogdanBrizarea—AJAX and PHP (Second edition)

SITE

- www.w3schools.com/

- www.sitepoint.com/article/

- www.mkgandhi.org

- http://stackoverflow.com/

Appendix B

USER MANUAL

Step1
Make circuit connection properly

Step2

Power the module with 5v supply

Step 3

Range sensor detects range and alerts