

Smart Fan using IoT

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Abstract—India has the highest suicide rate in the South-East Asian region, according to the World Health Organization’s latest report. The report released a day before World Suicide Prevention Day in 2019, pegged India’s suicide rate at 16.5 suicides per 100,000 people. Since the start of the pandemic due to the corona virus, the suicide rates have increased.

The most commonly used method of suicide is by hanging oneself to a fan.[1] A system has been proposed to prevent these cases. This system is based on IoT and uses different sensors. Thus, this prevention system will help save lives.

Keywords—Arduino Uno, weight sensor, fan

I. INTRODUCTION

The proposed system uses a weight sensor to immediately weigh the person once they try to hang themselves. As soon as the reading in the sensor changes, the fan will drop down to a level where the person cannot get hurt and is saved. The rod that holds the fan is internally connected to a spring, which expands when the load extends a certain limit. To alert this situation, the system uses an alarm sound that goes off as soon as the weight sensor reading is changed. Simultaneously an emergency message will be sent to the registered emergency contacts so that they are aware of the situation and can take the necessary action. The health department will be alerted about the situation and the location will be shared. A chat bot is created so that the victim can express themselves and overcome the stress.

Sl. No.	Year	Total Number of Suicides	Mid-Year Projected Population* (in Lakh)*	Rate of Suicides*** (Col.3/Col.4)
(1)	(2)	(3)	(4)	(5)
1	2015	1,33,623	12,591.1	10.6
2	2016	1,31,008	12,739.9	10.3
3	2017	1,29,887	13091.6#	9.9
4	2018	1,34,516	13233.8#	10.2
5	2019	1,39,123	13376.1#	10.4

Table 1: Number of Suicides, Growth of Population and Rate of Suicides during 2015 – 2019[5]

SL.	Means/Mode Adopted	Percentage & Number	
		2018	2019
(1)	(2)	(3)	(4)
1	Consuming Sleeping Pills	0.7% (939)	0.5% (753)
2	Drowning	4.9% (6,579)	5.2% (7,208)
3	Fire/Self Immolation	4.4% (5,950)	3.8% (5,234)
4	Firearms	0.4% (521)	0.3% (428)
5	By Hanging	51.5% (69,306)	53.6% (74,629)
6	By Poison	26.7% (35,862)	25.8% (35,882)
7	By Self inflicting Injury	0.6% (772)	0.6% (828)
8	By Jumping	1.9% (2,557)	1.5% (2,034)
9	By Coming under Running Vehicles/Trains	2.9% (3,848)	2.4% (3,337)
10	By Touching Electric Wire	0.4% (565)	0.5% (752)
11	By Other Means	5.7% (7,617)	5.8% (8,038)
12	Total	100.0	100.0

Note: Bracketed () refer to Number of victims who have committed suicides

Table 2: Percentage of Means/Mode Adopted by Victims to Commit Suicide during 2018-2019[5]

II. METHODOLOGY

A. SMART FAN PROTOTYPE

- To prevent the suicide cases, we have come up with a solution using IoT.
- The block diagram represents the communication between the weight sensor, buzzer, spring, fan and Arduino.
- The idea is to use a weight sensor to immediately weigh the person once they hang themselves. As soon as the reading in the sensor changes, the fan should drop down to a level where the person cannot get hurt and is saved. The rod that holds the fan is internally connected to a spring, which expands when the load extends a certain limit.
- To indicate the situation, we will be using a buzzer that goes on as soon as the weight sensor reading is changed.
- Simultaneously an emergency message will be sent to the registered emergency contacts so that they are aware of the situation and can take the necessary action.

B. WEBSITE AND CHATBOT

Website is being created to help users register with their details and emergency contact numbers. It also contains chatbot so that the victim can express themselves and overcome the stress. This provides a safe space for everyone to interact openly.

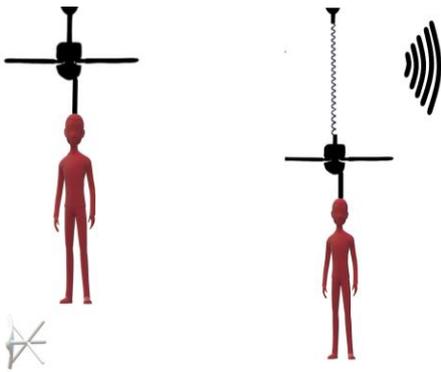


Figure 1: Methodology

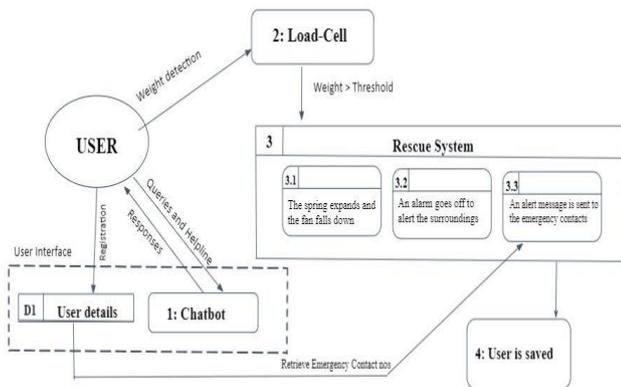


Figure 2: Data flow diagram

III. SYSTEM IMPLEMENTATION

A. SMART FAN PROTOTYPE

- The components of the smart fan are connected to the IoT system through Arduino Uno. It consists of an Arduino weight sensor, a buzzer and a Liquid Crystal Display, and a gsm module.
- When a suicide is attempted, the load sensor which is placed at the neck of the fan detects a change in reading. If the detected weight exceeds the set threshold, a latch is triggered and the rod of the fan which is internally connected to a spring, drops down, rendering the person safe.
- Simultaneously, when the load sensor detects a change in the reading, an alarm buzzer will go off, alerting the surrounding environment about the situation.
- The weight detected on the load sensor will be displayed on the LCD screen.
- A GSM module is being used to send an emergency alert message to the registered contacts. The GSM module will consist of the registered emergency contacts to immediately send the message.
- A RFID card is used to store a unique code which can be used to provide authority to a person in-charge to retract the fan to its original position. A person can be made in charge in college hostels and apartments to keep the card and use it when the situation arises.

B. WEBSITE AND CHATBOT

- Before installing the smart fan, the user registers on our website by providing his personal details like name, email id and phone numbers. As mentioned earlier, these details are stored in the cloud database.
- The registered details are accessed from the cloud and when a fan is fit in a particular place, the details can be stored onto the GSM module according to their customisation
- These details are used to contact or alert the concerned personnel in the event of a suicide attempt.
- A ChatBot is integrated in the website. It can be used to assess the condition of the victim. It can also be used to provide computerised therapy to help the victim overcome the stress or depression.
- It finally provides contacts of resources such as therapists, doctors, ambulance or police for obtaining further help.
- The ChatBot feature can also be used to improve the mental condition or seek help in general, to prevent a suicide attempt all together.

IV. SNAPSHOTS AND RESULTS

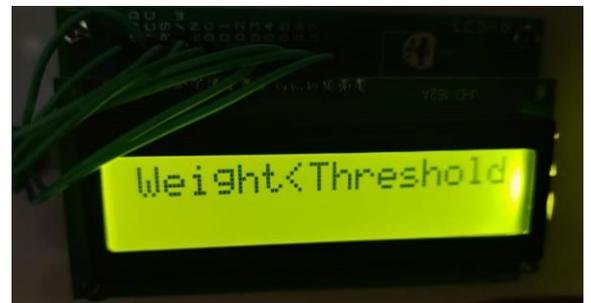


Figure 3: When the weight measured is lesser than the threshold, the alert system will not be activated.



Figure 4: When the weight measured is greater than the threshold, the alert system is activated.

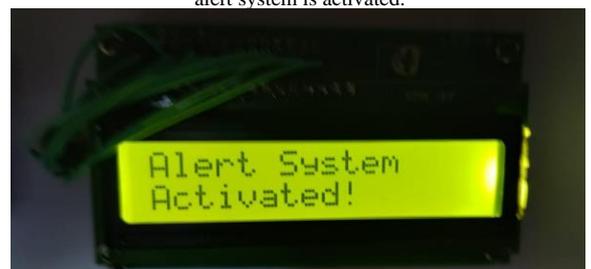


Figure 5: The above image indicates that the weight measured is lesser than the threshold.

V. CONCLUSION

- The development of an IoT model for suicide prevention. The objectives of this project are to decrease the number of suicides which occur by hanging oneself to a fan and provide a platform which is safe and open for mental health communication.
- Both the objectives are being met by establishing communication between the transmitting and receiving end i.e. by altering the close contacts of the person through an emergency message whenever a suicidal act is attempted. In addition to that, a chatbot is created so that the victim can express themselves and overcome the stress.
- Therefore, by implementing such a model, the number of suicidal cases can be prevented globally

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