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Development of Pendant ID Card for the Contact Tracing of COVID-19 Person Using Wireless Sensor Network

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ABSTRACT - Detecting COVID-19 early may help in devising an appropriate treatment plan and disease containment decisions. The current COVID-19 pandemic has impacted the world with over 18.35 million infections and over 6,96,147 deaths so far (as of 5th August 2020) [1]. Early identifying, isolation and care for patients is a key strategy for a better management of this pandemic. This Feature Topic (FT) aims to encourage researchers and practitioners from both industry and academia, active in the Internet of Things (IoT) domain, to explore the state-of-the-art and out-of-the-box IoT solutions to combat the COVID-19 pandemic by incorporating IoT-based smart solutions. For those essential workers who aren't able to stay home, Wireless sensor monitoring and insights can help reduce worker's risk. For example, rather than waiting until individuals test positive, Software can be used to help identify when area infection rates climb and redistribute workers to avoid infection in the first place.

Index Terms **– COVID-19, Wireless Sensors, Corona Virus Detection.**

I. INTRODUCTION

Corona viruses are a famous family of viruses that cause illness in both humans and animals. The new type of corona virus COVID-19 was firstly discovered in Wuhan, China. However, recently, the virus has widely spread in most of the world and causing a pandemic according to the World Health Organization (WHO). Further, nowadays, all the world countries are striving to control the COVID-19. There are many mechanisms to detect corona virus including clinical analysis of chest CT scan images and blood test results. The confirmed COVID-19 patient manifests as fever, tiredness, and dry cough. Particularly, several techniques can be used to detect the initial results of the virus such as medical detection Kits.

Throughout history, pandemics have been a constant shadow, attached to the tale of human life. In most cases, pandemics follow a similar pattern. A cluster of infections is discovered. As more people get infected, healthcare professionals start working around the clock. Some attempt to contain the pandemic, while others care for the sick. And a global disruption of life spirals out of control. The recent surge of COVID-19 pandemic has affected all spheres of our daily life.

This Feature Topic (FT) aims to encourage researchers and practitioners from both industry and academia, active in the Internet of Things (IoT) domain, to explore the state-of-the-art and out-of-the-box IoT solutions to combat the COVID-19 pandemic by incorporating IoT-based smart solutions. Such solutions can range from IoT-based industrial production of ventilation units, masks and other medical equipment to monitoring patient conditions at hospitals or self-isolation at home in a secure manner, developing new techniques for passive, privacy-preserving contact-tracing techniques, and diagnosing the COVID-19 conditions based on IoT and mobile phone data collection and analytics. Although infection rates are not controlled and effective treatment is not properly distributed, yet social restrictions are lifted in unlock 5. Some people and industries are return to work, with many safety measures to recover their economy.

COVID-19 is a global disaster affecting economies throughout the globe. Many industries see massive monetary losses, and businesses are going bankrupt. Although unlock process is started still many industries facing problem due to increasing rate of Covid positive patients, it is not possible to close working after detection of individual positive employee. Also it is difficult to find contacted employees with Covid positive employee.

For those essential workers who aren't able to stay home, Wireless sensor monitoring and insights can help reduce worker's risk. For example, rather than waiting until individuals test positive, Software can be used to help identify when area infection rates climb and redistribute workers to avoid infection in the first place.

Some specific ways our product is contributing to these efforts include tracking and prediction, and treatments and cures.

II. RELATED WORK

Some author proposed, a new framework is proposed to detect COVID-19 using built-in Smartphone sensors. The proposal provides a low-cost solution, since most of radiologists have already held smart phones for different daily- purposes. Not only that but also ordinary people can use the framework on their smart phones for the virus detection purposes.

RF based Wireless remote control generator system that can be interfaced with automatic changeover. This work is designed to bridge the gap between the generator system and the owner. The owner can remotely switch ON or OFF generator kept at 100 meter distance around his building which operates with a radiofrequency of 435MHz. Wireless radio frequency module consist of two units, transmitter unit and receiver unit. RF module is used to build wireless communication between two points. In this tutorial author uses RF module at 433MHz frequency and it support baud rate 9600 ,they use USART to interface RF module with microcontroller. The transmitter module seems to have a range of several meters without an antenna.

Wireless sensor and actuator network for the agriculture industry. In this scheme, sensor nodes conduct a local estimation based on kalman filter for enhancing the estimation stability and further transmit data to the actuator nodes under a multirate transmission mode for enhancing the overall energy efficiency of the wireless network. Some article present an RF communication system designed for collecting data from environmental sensors. The secure communication layer using encryption was implemented into the existing communication system.

The current COVID-19 pandemic has impacted the world with over 18.35 million infections and over 6,96,147 deaths so far (as of 5th August 2020) [1]. Early identifying, isolation and care for patients is a key strategy for a better management of this pandemic. For controlling situation government conduct lockdown program due to that all world stops. COVID-19 is a global disaster affecting economies throughout the globe. Many industries see massive monetary losses, and businesses are going bankrupt. Banks are trying to meet the growing demand for loans, but whether they can meet the supply is yet to be seen. However, amidst all of these losses and blows to the global economy, stands the technology industry. To overcome such problem we proposed to make a pedant using which we can detect contacted people with Covid patients. This product is useful for big organizations, industries.

III. PROPOSED METHODOLOGY

Researchers and public health organizations are using RF models to ingest and analyze contacted device in the given range. This model can be retrained with corona virus data and applied to the current pandemic. The data is stored in RF pendant in the form of bits. RF pendant is both transmitter and receiver type. Pedant is having memory chip to store data in given range.

In combination, this data can be used to track how well an area is managing infection rates and predict infection growth and decline. This data can also possibly be used to identify vulnerable areas that have not yet been widely infected. Data can then be applied to helping local communities enact appropriate precautionary measures and accurately gauge the risks of leaving businesses open.

The device can be use as a digital ID card of user. With the help of this device we will get details of user. It can be used to check attendance of the user. The device can store up to 1000 device data. Users Data can be collected in software; also contacted person log is also get recorded. Distance i.e. range of data transmission in a device can be control using software. The device can be issue by user if he is new to the organisation. If person left the organisation, have to return device. Superadmin can control device

issue, return activities. With the help of software we can create many companies, many user scenarios. Superadmin can handle the permission to access device in many companies. Superadmin can control device access to company as well as user too.

The main objectives of our paper are listed below.

- To generate QR code for person identification.
- To build a software to control activities of multiple companies in Superadmin.
- To predict the Covid-19 person using WSN

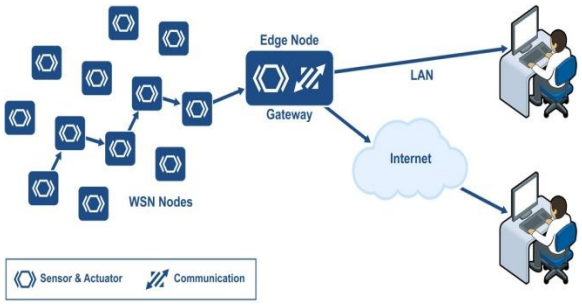

Fig 3.1. Data transmission between receiver pendant and transmitter pendant over Wireless sensor network

Pendant is made up of controller having radio frequency and memory chip. Single pendant itself work as data receiver and transmitter too. It will store data of a traced pendant in the memory chip within given range. Pendant can save up to 1000 pendant data in the form of bits. Whenever any positive person detected, the pendant of that person have to connect with the system to get the log of contacted persons. We can get detail information of device holder and contacted persons too. In the above diagram wsn nodes are nothing but pendants in a network. Multiple people can access that data from Superadmin panel. In wireless sensor network all devices are connected in a mesh topology. Whenever any node comes in range of other node it get automatically traced by other device and both node can exchange their data.

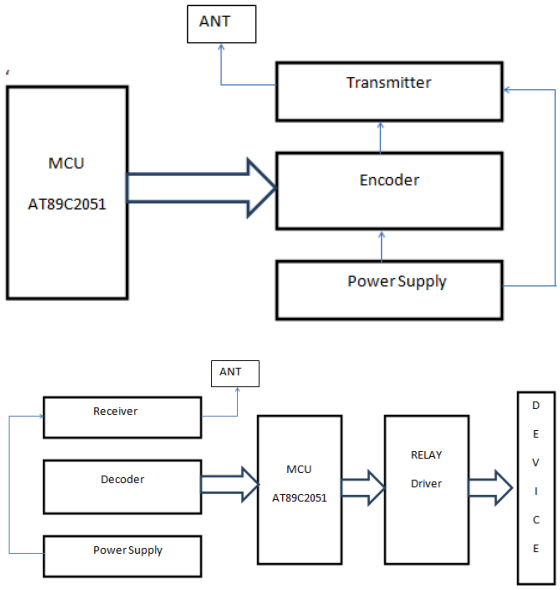

Fig 3.2. Block Diagram of receiver pendant and transmitter pendant over Wireless sensor network

IV. CONCLUSION AND LIMITATION

In this study we can easily detect people around Covid positive patient. Using this device we can easily manage employee data in the organization. We can also maintain data of multiple companies too. There is no need to stop working of whole department when any one of that department comes positive. This device reduces risk due to the isolation of the individual and their contract traces and the mental anguish and stress caused by both the prognosis and the social isolation.

The only limitation of this product is that device's battery life is low. Device has to charge using USB cable. After charging the device gets ON whether it is in use or not in use. There is no ON/OFF mechanism created in this device.

V. REFERENCES

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