

Smart ID Card for Covid-19

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Abstract: The college lives of students cover a wide range of transactions which he/she has to make in order to fulfill the requirement of the day. Some of the Factors are usually covered by the small denominations of current situations carried by students, which allows them to take care for public. To reduce the hassle created by the variety of modes of payment, we suggest a Smart-ID card which can be used to pay for day-to-day campus needs and allow student or faculty member of the college/university to keep track of the distancing, maintain their social distance. Social distancing refers to a host of public health measures aimed at reducing social interaction between people based on touch or physical proximity. It is a non-pharmaceutical intervention to slow the spread of infectious diseases in the communities. It becomes particularly important as a community mitigation strategy before vaccines or drugs become widely available. This essay describes how a protracted adherence to social distancing guidelines could affect the Indian society. Changes are expected in some of the prevalent cultural norms such as personal space and common good. Working patterns are likely to become more flexible and promotive of social distancing. Human interaction based on digital technology is likely to increase. The implications for public health in India due to such changes are also discussed.

Key Word: Covid-19, Social Distancing, NRF52832, Smart id card

I. Introduction

One way of limiting the spread of an infectious disease, for instance, Covid-19, is to practice social distancing. This is not a new concept, as most societies have been aware of the value of keeping away from people who are suffering from an infection for many generations. It is an action taken to minimize contact with other individuals. It has been suggested that maintaining a distance of approximately 2 meters from another individual result in a marked reduction in transmission of most flu virus strains, including COVID-19. In practice, this means that avoiding close proximity to other people will aid in slowing the spread of infectious diseases. Social distancing is one of the non-pharmaceutical infection control actions that can stop or slow down the spread of a highly contagious disease. Currently, all of us are experiencing emotions, thoughts and situations we have never experienced before. It is not that there were no pandemics earlier. Pandemics, particularly plague outbreaks have been known since times immemorial. The Cholera pandemic followed by the flu pandemic was highlights of the nineteenth century. The pandemic of COVID-19 is on a completely different scale. It has shaken the entire world and created global panic. As COVID-19 initially creeps in and subsequently spreads at a galloping pace, it has been ravaging country after country. The social distancing and lockdown have also led to several changes in day-to-day activities, redistribution of home chores, extensive working from home and greater time spent with those living together. Continuing challenges include the development of protocols for emergency care for suspected COVID-19 patients as well as positively diagnosed patients with appropriate precautions for the safety of the treating psychiatrist and other health personnel. The kind of modifications that might be required in the rapid tranquillization of COVID-19 positive patients, modifications in

interventions like ECT, TMS, DCS require to be further examined, especially if this pandemic prolongs or lingers. When compared to existing systems, the proposed system aims to be more reliable and cost-effective. The cost savings are achieved by combining software and hardware infrastructure to provide the most reliable service for our requirements.

II. Material And Methods

Literature Survey: Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China in December 2019. The disease has since spread worldwide, leading to an ongoing pandemic. Symptoms of COVID-19 are variable, but often include fever, cough, headache, fatigue, breathing difficulties, and loss of smell and taste. Symptoms may begin one to fourteen days after exposure to the virus. Smart Cards have been used as portable, integrated devices that are capable of storing crucial information and have certain data processing capabilities. In almost all sectors, these cards have been used extensively for many years now, giving rise to new possibilities every day. The ability of these cards to enable easy, efficient and fast data access has led to their popularity and widespread usage in the transportation sector. In this research, a smart card solution to store all vehicles related information is proposed. The current global challenge of the pandemic caused by the novel severe contagious respiratory syndrome coronavirus 2 presents the greatest global public health crisis since the pandemic influenza outbreak of 1918. At the time this paper was written, the number of diagnosed COVID-19 cases around the world had reached more than 31 million. In the context of COVID-19, IoT enabled /linked devices/applications are utilized to lower the possible spread of COVID-19 to others by early diagnosis, monitoring patients, and practicing defined protocols after patient recovery. This paper surveys the role of IoT-based technologies in COVID-19 and reviews the state-of-the-art architectures, platforms, applications, and industrial IoT-based solutions combating COVID-19 in three main phases, including early diagnosis, quarantine time, and after recovery.

Objectives:

To Interrupt human-to-human transmission of the covid-19.

To help covid worriers with contact tracing data.

To keep track on an individual health.

To keep track on body temperature of a person.

Hardware Development The system consists of an BLE module, a micro-controller NRF52832, a buzzer and an LED indicator as shown below. In this work, the Bluetooth sensor was used to detect the distance of any obstacle behind the person wearing the device. The function of the micro-controller is to read the value from the sensor, calculate the distance between the subject and a person behind him and remind the person if the distance is less than a metre. Here, the NRF52832 micro-controller was employed due to its compatibility with most external devices and capability to operate at high speed. The buzzer was included to produce a sound whenever a person behind is closer than 1 metre hence disobeying the safe physical distance. The function of the temperature sensor is to record the temperature of a person wearing Id card. Which will help an individual to keep track on health. All the data will go through gateway which will have contact data of all individual in turn will be help for contact tracing if one is infected or showing symptoms.

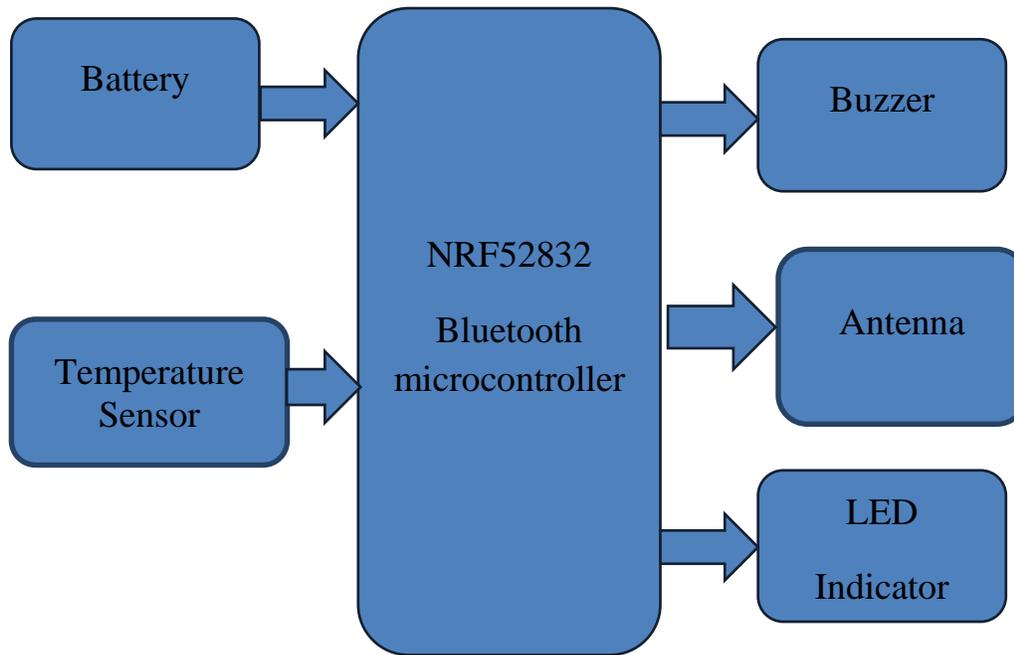
Hardware used.

Bluetooth controller module, Buzzer alarm ,LED Indicator ,Temperature Sensor(MAX31820), Battery

Proposed Methodology:

- 1) This system will measure distance via BLE module and if there is any interaction between with other id card then it will notify.
- 2) The notification will be through buzzer in case of social distancing is violated.
- 3) The system will measure the temperature of concern person so to keep track the person's body temperature.
- 4) The id card will save the contact data (number of times it comes in contact with other person(id card)).
- 5) This data will help if any infected person comes in contact with a person.(both person wearing id card)

Figure No 1: Proposed system diagram.



III. Result

Table No 1: covid test reference

	Test	Type of sample	Timing
Patient	NAAT	Lower respiratory tract {Sputum, aspirate, Lavage} Upperrespiratorytrack (nasopharyngeal)	Collect on presentation.
	Serology	Serum for serological testing once validated and available	Collected 2-4 weeks later

{ Specimen collection and storage }

Specimen type	Collection materials	Storage temperature until testing in-country laboratory	Recommended temperature for shipment according to expected shipment time
Nasopharyngeal and oropharyngeal swab	Dacron or polyester flocced swabs*	2-8 °C * Rectangular Strip	2-8 °C if ≤ 5 days -70 °C (dry ice) if > 5 days
Bronchoalveolar lavage	Sterile container *	2-8 °C	2-8 °C if ≤ 2 days -70 °C (dry ice) if > 2 days
(Endo)tracheal aspirate, nasopharyngeal or nasal wash/aspirate	Sterile container *	2-8 °C	2-8 °C if ≤ 2 days -70 °C (dry ice) if > 2 days
Sputum	Sterile container	2-8 °C	2-8 °C if ≤ 2 days -70 °C (dry ice) if > 2 days
Tissue from biopsy or autopsy including from lung	Sterile container with saline or VTM	2-8 °C	2-8 °C if ≤ 24 hours -70 °C (dry ice) if > 24 hours
Serum	Serum separator tubes (adults: collect 3-5 ml whole blood)	2-8 °C	2-8 °C if ≤ 5 days -70 °C (dry ice) if > 5 days

The device will check whether the person is less than a metre from the wearer or otherwise. If the distance is less than a metre, a warning sound will be produced and the distance and a warning message will be displayed on the LCD. However, if the person is in a safe distance, which is more than one metre, the system will display the distance and a safety reminder. The accuracy of detecting the distances, Ad was measured by dividing the difference between the actual distance, Da and the measured distance, Dm by the actual distance and multiplying the result with 100 per cent. The id card will also track the number of persons it is in been in contact.

$$A_d = \frac{D_m - D_a}{D_a} \times 100\%$$

Table No 2: Result Analysis

Person	Distance	Temperature
A	0.2m	36°C
B	0.5m	37.5°C {warm body}
C	1m	36.5°C

IV. Conclusion

The development of Smart id card for covid-19 system has been described in this paper. The system employed an ARM microcontroller and an temperature sensor to detect and measure the distance between a subject and temperature of person wearing it. It equipped with a buzzer to notify that the physical distancing of 1-metre is not followed. The system could perform the social distancing detection accurately. This system can be improved to be more interactive to the user such as by sending a notification through a smartwatch to remind them of their distance or including a vibrating disc to increase the awareness to the user. Thermal or infrared sensor also used be to detect a human's body temperature to produce more accurate results of detecting another human near the user. These measures secure physical distance between people (of at least one metre), and reduce contact with contaminated surfaces, while encouraging and sustaining virtual social connection within families and communities.

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