IJIREEICE

ISSN (Online) 2321-2004
ISSN (Print) 2321-5526

International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering

Vol. 9, Issue 3, March 2021

DOI 10.17148/IJIREEICE.2021.9307

CYE-Check Your Employee Automated HR Maintenance system for Pandemic

Mr.S. Prassanna Perumal[1] , Gowri.K[2], Mahalakshmi. S. P[3], Lavanya.B[4] ,Sindhuja.C[5]

Assistant Professor, Department of ICE, Saranathan College of Engineering, Trichy, Tamilnadu, India[1]

UG Final year Student, Department of ICE, Saranathan College of Engineering, Trichy, Tamilnadu, India[2,3,4,5]

Abstract: COVID-19 is both a global health crisis and international economic threat. The worldwide lockdown of companies and industries that were implemented and mandated to curb the spread of the virus generated a good array of unique and fundamental challenges for both employees and employers across the globe.
At the individual level, populations of shutdown affected employees were turned overnight into

- "Work from home" employees,
- "Essential" or "Life-sustaining" workers (e.g., emergency room medical personnel and supermarket staff)
- Furloughed or laid-off employees seeking the nation-specific equivalent of unemployment benefits.

This project automates the entry/exit of the employees in any industry or workplace, by detecting their body temperature automatically as the employee checks in, maintain and analyse the data for future reference.
It provides a low-cost hardware integrated solution for employee management system especially during Pandemic Situation. This automated solution enables the Employer to maintain a safe working environment for their employees, periodically check his Employees health data, their vaccination details, swab test reports etc.

Keywords: Automation, Body Temperature Sensing, Pandemic Management, Health Security.

I. INTRODUCTION

Certain Industries that need to run even in the pandemic situations struggle to maintain the health history of their employees. There are many systems for maintaining the employee database, but current pandemic situation has created a need for maintaining the health history of the employee and continuously monitor the same to keep check on potential risk of any infection spread.
In 2019, not even 10% of business leaders from developed countries considered the spread of any diseases as a global risk. Nor were companies anticipating that an epidemic might test their public reputation as a responsible employer. Yet in early 2020 all organizations started facing a big crisis and the need to address the urgent concerns of various categories of workers like those who can and continue to work remotely, non-remote workers who can work remotely with proper support, those that cannot work for a spread of reasons and people who still work in person. Moreover, many companies, across many sectors, had not implemented flexible or remote working arrangements. Even many companies struggle in establishing and maintaining a safe working environment for their non-remote working population. In the current situation, most businesses are in necessity to put in place new measures for their workforces rapidly – often with no previous comparable experiences.
The four magnitudes of employee welfare are – physical, emotional, financial and social – are the vital elements of the employee experience and crucial to an engaged and productive workforce in regular times. During a pandemic, wellbeing assumes a new urgency. An employer's actions in supporting wellbeing are critical to putting together and sustaining workforce resiliency and sending the message that employees' matter.
Companies got to support employees through clear communication during all phases of an organization's response to COVID-19. They need to maintain a very safer workspace for their resources to come and work efficiently. And companies must seek to maximise the coverage of all employees, including those in roles where remote work is feasible also as non-mobile employees (e.g., customer-facing retail and repair workers). Henceforth, an integrated system to check and maintain the employee health history is all that is the need of the hour and world indeed.

II.SYSTEM MODEL AND ASSUMPTIONS

It is a temperature sensing system integrated with PC that measures and maintains the body temperature of the Employee. The Employee can check in with a QR code provided in his ID card, which can be read by the QR Scanner of the System. It validates the identity of the Employee and checks his body temperature. By processing the temperature with internal algorithms, the system allows the Entry of the Employee if: - His Temperature is normal AND His health check-up is up

IJIREEICE
ISSN (Online) 2321-2004
ISSN (Print) 2321-5526
International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering
Vol. 9, Issue 3, March 2021
DOI 10.17148/IJIREEICE.2021.9307

to date. If any of the above condition is not satisfied, then the person is denied entry and the notification is sent to the HR Manager.

Temperature sensing is done with Non-contact type Temperature sensor to maintain hygiene. This system maintains the health history of the employee along with the attendance data. It is assumed that during the Pandemic situation, an employee is expected to take regular health check-ups and that data also should be maintained in the official records.

This project is a control system with temperature as the regulating parameter, that keeps check on the entry and exit of the Employee.

Fig 1. MLX90614 Temperature Sensor

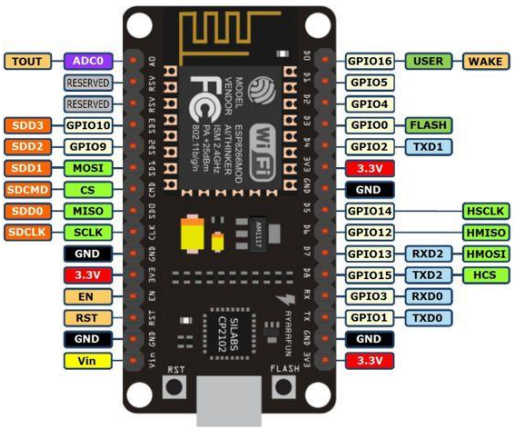

Fig 2. NodeMCU Pinouts

III.WORKING AND METHODOLOGY

The entire set up is divided into two parts – Sensing System and Analytics System

1.CYE Sensing System:

This set up consists of QR Scanner and Non-Contact Temperature sensor. The QR scanner mounted at the sensing area where the employee scans his ID card to Check IN. Once the code is scanned, the employee's name and his ID number is displayed in the UI, then the temperature sensor senses the temperature of the Employee. The temperature data is analysed in the Analytics system, to validate the entry of that Employee. The Employee data scanned from the QR code and the temperature data is collected and stored in the data base.

2.CYE Analytics System:

This set up is the back-end algorithm of the proposed software. The temperature data collected from the sensor is analysed and determined if the employee's temperature is acceptable for entry. If any abnormal body temperature is sensed, the employee is alerted and denied entry. The HR is notified about the same, so that the required precautions can be taken to contain the infection and potential threat. The Process is entirely automatic and mobile notification is sent to the concerned official through cloud technology.

IJIREEICE

ISSN (Online) 2321-2004
ISSN (Print) 2321-5526

International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering

Vol. 9, Issue 3, March 2021

DOI 10.17148/IJIREEICE.2021.9307

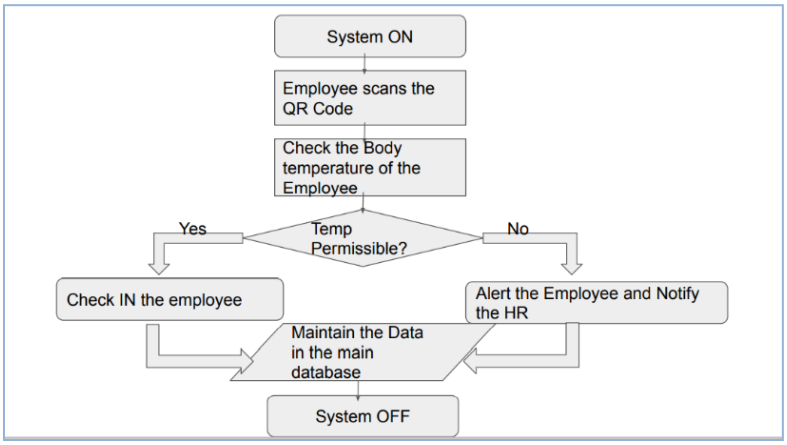

Fig. 3 Methodology

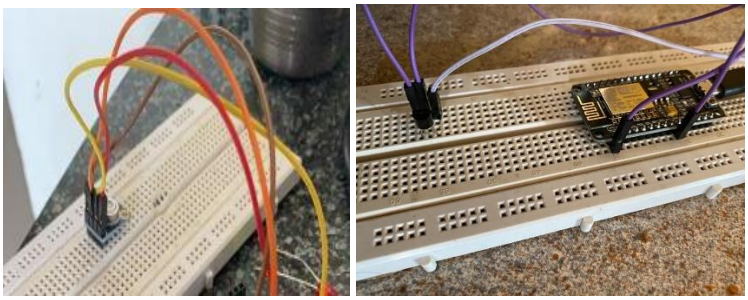

Fig .4 Hardware- Temperature Sensor Interface with NodeMCU Micro-controller

Fig 4 shows the interfacing of temperature sensor with NodeMCU. The sensor MLX90614 reads the temperature in both Celsius and Fahrenheit, which is uploaded to the cloud named “Thingspeak” from where it is retrieved and logics are applied in the LabVIEW.

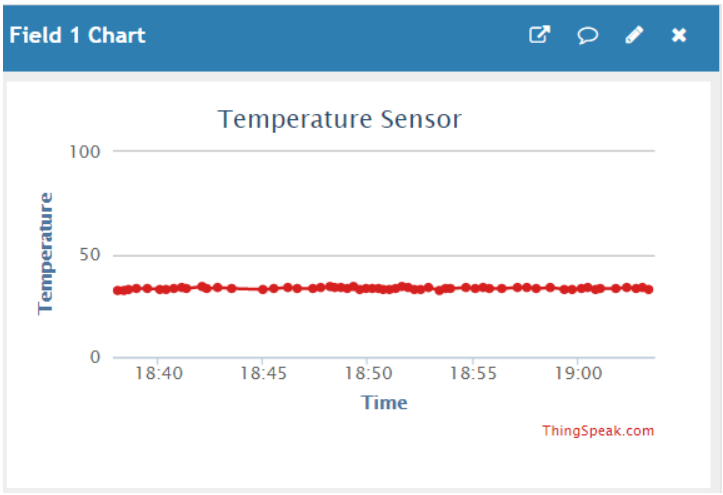

Fig 5. Temperature Sensor output from Cloud

IV. SIGNIFICANCE OF THE SOLUTION

Amidst this Pandemic situation, any employee working physically in a workspace tend to face the risk of infection. He might be a victim of the infection or a potential carrier who can infect to his fellow mates. To check this potential risk, minimum precaution which can be taken is to monitor the body temperature of the employee during his entry/exit to the workplace. Manually checking the temperature of the employees results in following shortcomings:

- No Data Logging

IJIREEICE
ISSN (Online) 2321-2004
ISSN (Print) 2321-5526
International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering
Vol. 9, Issue 3, March 2021
DOI 10.17148/IJIREEICE.2021.9307

- Possibility of Manual Error
- Tedious and Repetitive Process
- Time consuming
- Difficulty in Data Maintenance

This project automates the entry/exit of the employees in any industry or workplace, by detecting their body temperature automatically as the employee checks in, maintain and analyse the data for future reference. It provides a low-cost hardware integrated solution for employee management system especially during Pandemic Situation. Our solution proposes following features: -
1. Validates the employee check in/Check out at the entry and exit.
2. Automates the temperature checking of the employees during entry.
3. Identifies potential risky employees and alerts them.
4. Maintains the health data of the employees, thereby tracking their infection probability/possibility.

This automated solution enables the Employer to maintain a safe working environment for their employees, periodically check his Employees health data, their vaccination details, swab test reports etc.

V. RESULT AND DISCUSSION

In the Fig 6, it shows the Front Panel of the application. The User Interface is designed using LabVIEW and the inputs include- Temperature Sensing and QR code scanning.

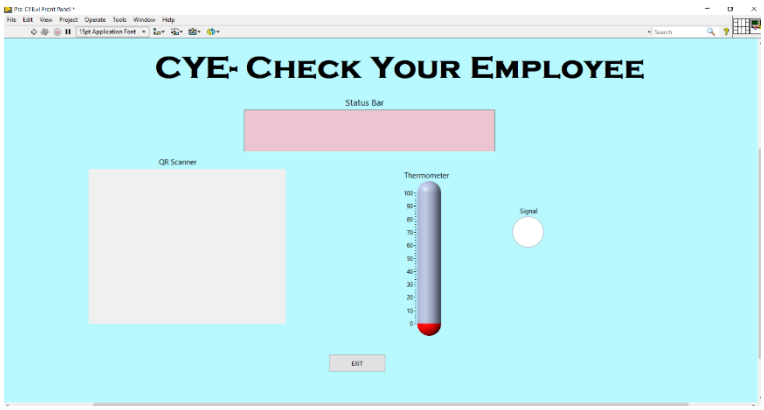

Fig. 6 Front Panel of the Application

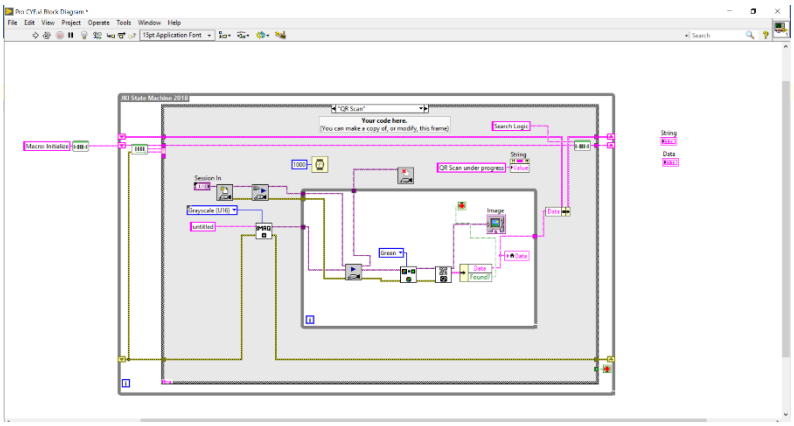

Fig. 7 Block Diagram and Software Architecture

Fig 7 shows the Block diagram i.e., the back-end code of the Application. The prime packages used for coding is JKI statemachine and Actor Framework installed from VI Package Manager.

IJIREEICE

ISSN (Online) 2321-2004
ISSN (Print) 2321-5526

International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering

Vol. 9, Issue 3, March 2021

DOI 10.17148/IJIREEICE.2021.9307

VI.CONCLUSION

Thus, this solution enables the Employer to automate the Employee check in/Check out process during Pandemic in any Industry/Workspace. Also, Maintain the data of Temperature of the Employee during entry/exit, along with health Check-up details. Therefore, to Identify the Employees at Risk and take necessary precautions to prevent spread at workspace.

REFERENCES

[1] Employee Management System-INTERNATIONAL RESEARCH JOURNAL OF ENGINEERING AND TECHNOLOGY (IRJET) VOLUME: 06 ISSUE: 05 | MAY 2019
[2] Challenges of Implementing an Employee Management System for Improving Workplace Management Effectiveness - Journal of Environmental Treatment Techniques 2019, Special Issue on Environment, Management and Economy, Pages: 1200-1203
[3] PC based Monitoring of Human Temperature Signal using LabVIEW -INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN ELECTRICAL, ELECTRONICS, INSTRUMENTATION AND CONTROL ENGINEERING Vol. 3, Issue 3, March 2015
[4] LM35 Temperature Sensor Using LabVIEW and NI myDAQ-International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9, Issue-1, November 2019
[5] https://forums.ni.com/t5/LabVIEW/Read-Data-LM35-using-NI-MyRio/td-p/3928347?profile.language=en
[6] https://www.hbs.edu/faculty/Publication%20Files/20-127_6164cbfd-37a2-489e-8bd2-c252cc7abb87.pdf
[7] https://www.ey.com/en_in/covid-19/covid-19-and-pandemic-planning--how-companies-should-respond
[8] Wireless Body Area Network Development for Remote Patient Health Observing, Abdul Salam Mahmood, Essa Jafer Dept. of Mechanical Engineering, Wasit University, Wasit, Iraq, Electrical Engineering Department, Princess Sumaya University for Technology, Amman, Jordan Sattar Hussain, Xavier Fernando Information and Computing Engineering Technology, Centennial College, Toronto (ON), Canada Dept. of Electrical and Computer Engineering, Ryerson University, Toronto (ON), Canada.
[9] MLX90614-Analog-Voltage-Output-Application-Note-Melexis.pdf
[10] MLX90614-Grounding-Layout-Application-Note-Melexis.pdf
[11] Mr.N.D. Agham, Mr.V.R. Thool, “LABVIEW-Based physiological parameters monitoring system for patient healthcare”, International Journal of Engineering research and technology, Vol 3, Issue 2, February 2014, ISSN:2278-0181
[12] Mr. Bhavin Mehta, Ms. Divya Rengarajan, Mr. Ankit Prasad "Real Time Patient Tele-Monitoring System Using LabVIEW", International Journal of Scientific & Engineering Research, Volume 3, Issue 4, April-2012, ISSN 2229-5518.
[13] Li, C. Zheng, C. Tai, “Detection of ECG characteristic points using wavelet transforms”, IEEE Trans. on Biomed. Eng., pp: 21-28, 1995.
[14] "Graphical Programming based Biomedical Signal Acquisition and Processing", INTERNATIONAL JOURNAL OF CIRCUITS, SYSTEMS AND SIGNAL PROCESSING