THERMAL DETECTION SWING GATE TURNSTILE WITH QR CODE APPLICATION

Charlie B. Antonio Jr.,
College of Computer Studies
Trimex Colleges, Biñan, Laguna, Philippines

Gerald L. Arandia,
College of Computer Studies
Trimex Colleges, Biñan, Laguna, Philippines

Bon Lynard F. Canta
College of Computer Studies
Trimex Colleges, Biñan, Laguna, Philippines

Harrold M. Gueta, MSIT(CAR)
College of Computer Studies
Trimex Colleges, Biñan, Laguna, Philippines

Carlo A. Batitis
College of Computer Studies
Trimex Colleges, Biñan, Laguna, Philippines

Abstract: Thermal Detection Swing Gate Turnstile with QR Code Application. An automated health form system could be a big step forward in upgrading and updating the health information system as we enter the new normal way of life. This may assist administrators at all institutions in executing their new standard operating procedures. However, some establishments, unlike others, continue to use a manual approach to implementing health and safety protocols, such as handing out a health declaration form to be filled out, and their information may not be secure, and spreading the virus by giving and using the same pen to all clients who enter the establishment's premises. The Thermal Detection Swing Gate Turnstile with QR Code Application was created to address all of these difficulties. First, a prototype for an automated health form system that may be used by all clients, students, and employees. We made it easier for clients to use our system by including QR codes and RFID readers for students and employees. This will save them time when filling out their health declaration papers, and their data will be considerably safer because we built admin and super admin access so that only authorized persons have access to it.

Keywords: Thermal Detection; RFID; QR Code; Automated Health Form; Internet of Things

I. INTRODUCTION

COVID-19 The world as it was before the pandemic changed. Many businesses have closed their doors. The world progressively returns to normal as the pandemic draws to a close. There was a lot of new stuff. New approaches to dealing with the pandemic had become normal.

The World Health Organization recommended using surgical or medical masks to prevent the infection from spreading. The government takes precautionary steps to protect the people from the covid-19 virus by easing the economy and imposing a lockdown. In addition, the government has established health and safety guidelines that must be followed at all times, even at home and outside. These include: (1) constant sanitization; (2) avoiding crowds; (3) maintaining physical distance in public areas and/or vehicles; and (4) wearing a face mask and face shield when going out.

II. BACKGROUND

Assessment of temperature is one the ways to early detect individuals if they have symptoms of COVID-19 Disease. This assessment nowadays is done manually by personnel.

Non-contact way of scanning temperature can lessen the risk and spread of virus.

At this point, safety was the most critical factor to consider. However, we still want to live our lives regularly as we did before the current pandemic. During the COVID-19 pandemic, businesses, transportation systems, and other community organizations are working on preparations to go back to normal. Initial assessments are carried out in these plans in order to identify people who may be contaminated with COVID-19. One way to tell if a person has COVID-19 disease is to take their temperature.

The spread of Covid-19 can be halted with the use of tools that employ the Contactless Temperature Scanner System. This system is intended for use in public areas, particularly in rooms or buildings. So that the transmission of the virus may be regulated and tracked via the Wi-Fi protocol, starting with an initial indication of high body temperature. Because of the availability of a design system like this, patients afflicted with the Covid-19 virus can be treated as soon as possible by a doctor and isolated so that they do not spread the virus.

In line with, this the proponents design and develop, " Thermal Detection Swing Gate Turnstile with QR Code Application" will help establishments to cater safety for individuals. It is done in non-contact way so it is safer. It can also efficiently manage to scan temperature of

individuals even a large group of people. Turnstile doors will not open for those individuals with high temperature. Safety will start at the entrance of the establishment's premises.

A. **OBJECTIVE OF THE STUDY**

The general objective of the study is to design and develop an application that will record and store data of the user and can also send the information using QR code this project also have a turnstile hardware that can be able to capture the user's temperature and must receive the user's data by the use of QR Scanner.

Especially, the study needs to achieve the following:

- To design and develop a module that will record an individual information
- To design and develop a module that will generate a QR code
- To design and develop a hardware that will scan the temperature of an individual
- To design and develop a hardware that will automatically open if the individual temperature is within the normal temperature and received the user's information.
- To design and develop that will let the hardware receive the user's information using QR code.
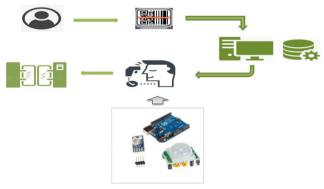
III. DESIGN OF THE STUDY

Figure 1. System Architecture

As illustrated above Figure 1, The components of automatic temperature identification are described in the illustration above. An administrator will be in charge of the user's account and reports. Admin is also in charge of registering new employees and creating QR codes for them. We also have a WEB CAM that can read the information on a QR Code and send it to the server, where it will appear on the screen. The Turnstile control can sense an employee's temperature and raise the barrier automatically.
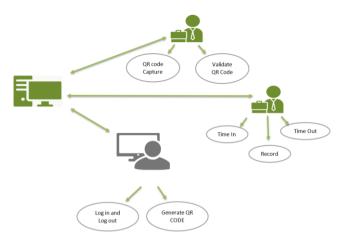

Figure 2 Network Design Infrastructure

The figure above shows the network connectivity of the project
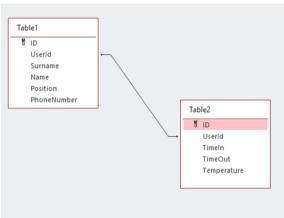
A. USE CASE DIAGRAM

Figure 3 Database Schema

The figure 3 shows the relationship of entity sets store in database. This figure defines the entities, their attributed and showing the relationship between them. The tables are attached by a specific primary key. This also demonstrates the database's logical structure.
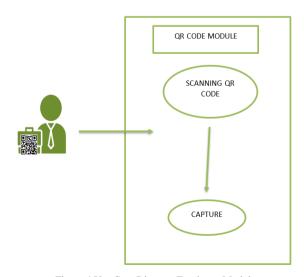

Figure 4 Use Case Diagram Employee Module

This figure 4 shows that in Employee Module has to scan the QR code and capturing employee.
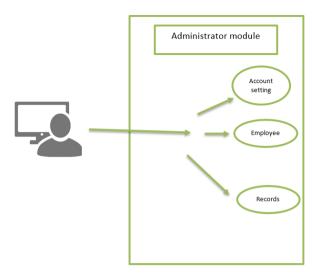

Figure 5 Use Case Diagram Administrator Module

Figure 5 shows how admin can accept the following module login, manage employee, manage the account, and view records.
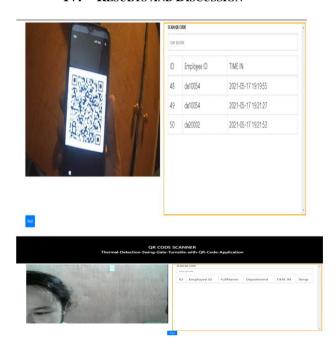
IV. RESULTS AND DISCUSSION

Figure 6: QR Code Scanner

The figure 6 above the optical scanning device that's able to read QR codes. That means you can likely point your camera at a QR code and be able to scan and read it.

Figure 7: Database

The figure 7 above that the information of the employee, once it's submitted it directly saved to our database.

Figure 8: Printing Records

The figure above shows the printing of records if it is requested or required by the company.
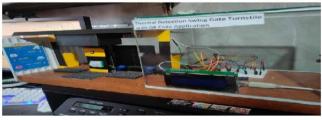

Figure 9: SMS Module

The figure 9 above shows It displays the temperature of the employee who are entering the premises.

Figure 10: Overall Hardware

The figure 10 above shows the whole set up of our hardware which is the warning sign, swing gate and LCD are included.

Figure 11: Employee Report Section

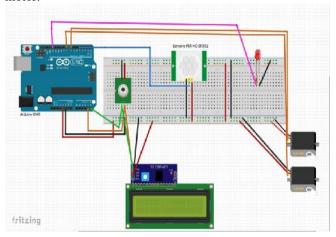The figure 11 above shows the Swing Gate using servo motor.

Figure 12: Schematic Diagram

The figure 12 above shows the schematic diagram of the hardware.

A.   SUMMARY OF SOFTWARE EVALUATION OVERALL MEAN SCORE

Table 1- Summary of Software Evaluation Overall Mean Score

Criteria	Mean	Interpretation
A. Functional Suitability	4.35	Agree
B. Reliability	4.28	Agree
C. Usability	4.21	Agree
D. Portability	4.36	Agree
E. Security	4.33	Agree
OVERALL MEAN	4.31	Agree

Generally, the software yielded to a total weighted mean of 4.31 from customer's respondents which fall on the AGREE in Likert's Scale. It is already being proven that there is no significant difference among the response of the compared means of the respondents.

V.   CONCLUSIONS

Based on the aims of the study and the results of the evaluation. The following conclusions were drawn

1. Using this system the facility will lessen having direct contact with the person who will enter the area.
2. Using the data obtained and saved from the database by the scanner the user can easily identify the possible close contact of the person who was proven with a contagious disease.
3. Using thermal sensors, we can easily detect early signs of contagious diseases. With this, we can provide medical assistance and prevent the spread of diseases from other staff/employees.
4. With the use of the QR Code generator the facility can easily create an image that contains the basic information of the person who enters the area.

VI.   ACKNOWLEDGMENT

VII.   REFERENCES

[1] Ahmad Fahmi, Mohd Fauzi,Nur Nabila Mohamed, Habibah Hashim, 2020, Development of Web-Based Smart Security Door Using QR Code System.
[2] AVTOD (ASTER Volcanic Thermal Output Database)Latin America archieve,
[3] Andrei Claudiu Cosma, Rahul Simha,(ed.) 2018, Thermal comfort modeling in transient conditions using real-time local body temperature extraction with a thermographic camera.
[4] Berg Amanda(ed.) 2016, Detection and Tracking in Thermal Infrared Imagery
[5] Reath, K.: Pritchard, M. E.: Moruzzi, S.: Alcott, A.: Coppola, D.: Pieri, D.(ed.), 2019, The
[6] Claudia Di Napoli, Florian Papprnberger, Hannah L. Cloke(ed.) 2018, Assessing heat-related health risk in Europe via the Universal Thermal Climate Index(UTCI).
[7] Cdt. Anay Mulik, Prof. Lalit Kumar, 2020, RFID/Barcode Scanner Half Height Tripod Turnstile,.
[8] Fong, and Benjamin J Cowling,(ed.) 2020, Non pharmaceutical Measures of Pandemic.
[9] Sukhyun Ryu, Huizhi Gao, Jessica Y. Wong, Eunice Y.C. Shiu, Jingyi Xiao, Min Whui Influenza in Non healthcare Settings-International Travel-Related Measures.
[10] Kalinda(ed.) 2021, Airport Turnstile Security Solutions? Mairsturnstile have rich industry experience and deep technology accumulation, provide customers with airport turnstile security solutions, office turnstile security solutions, factory turnstile security solutions.