

The Number of Visitor of the Class Pandemic Time Corona Virus Disease Limit During 2019 Based on Internet of Thing

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ABSTRACT

Number of visitors to engineering laboratory restrictions were carried out, because it could lead to crowds of students, resulting in the transmission of the SARS-CoV-2 virus that causes covid-19. The Telecommunications Engineering Laboratory is one of the facilities at the Sriwijaya State Polytechnic, which is used by all students to understand practically the telecommunication field. The design and manufacture of this tool aims to create a laboratory environment that is in accordance with health protocols in order to prevent transmission of *CoronaVirus Disease 2019* (Covid-19). The system for limiting the number of visitors to the telecommunications engineering laboratory uses RFID (*Radio Frequency Identification*), *Magnetic Sensors*, *Webcams* and *Touchless Buttons* as input functions. This system uses *Arduino Mega 2560 and Raspberry Pi 3* as the system's main controller processes. Component output using *Magnetic door lock*, *LCD 16x2*, *LED*, *Relay*, and *Warning Light LED*. *Magnetic door lock* functions as a door lock, *16x2 lcd* as a monitoring system work process, *relay* as a *switch* or switch to disconnect and connect electric current, *led* and *warning light led* as an indicator.

Keywords: *Auto, Digital system CoronaVirus Disease 2019, Arduino Mega 2560 Raspberry Pi 3, Touchless Button*

1. INTRODUCTION

Director General of Vocational Education (Dirjen Dikti), Wikan Sakarinto assesses that the policy to open face-to-face lectures is very good, especially for learning hands-on. There are several aspects that must be adhered to when conducting face-to-face learning. These requirements include checking body temperature, eliminating activities that have the potential to invite crowds, providing hand washing facilities, students are required to use three-layer cloth masks, maintain a minimum distance of 1.5 meters and limit room use to a maximum of 50% capacity per room and a maximum of 25 people. If the tertiary institution has fulfilled various requirements consisting of preparation, implementation, and monitoring, then all forms of face-to-face learning can be implemented. The laboratory is one of the supporting facilities available at the Sriwijaya State Polytechnic which is used by students for the implementation of practicum

courses. Each practicum consists of several modules that must be completed by each student. Telecommunications Engineering Laboratory is one of the laboratories at the Sriwijaya State Polytechnic, which is used by all students to understand practically the telecommunications field. The various kinds of practicum held at the Telecommunications Engineering Laboratory include; practicum of signal processing, telecommunication electronics, transmission line, measurement, microprocessor, multimedia technology and others.

The number of practicums carried out at the Telecommunications Engineering Laboratory, of course, can cause a crowd of students.

This visitor limiting device is designed using several components, including *arduino mega 2560* and *raspberry pi* as a microcontroller, *RFID* to activate the device, *touchless button* to trigger the door to open and to count the number of visitors, *webcam* functions as a visitor counter, *Magnetic door lock* to lock the door

when it reaches the maximum number, the *warning light* LEDs as an indicator of the full room, and the LCD serves to display the number of people in the laboratory. In addition, the number of visitors can also be accessed remotely by using the website, which to be able to access the website must be connected to the internet with a stable network connection. This is what is called an Internet of Things.

2. SUPPORTING THEORY

Webcam

Webcam is a combination of the words web and camera. Webcam itself is a term for cameras real-time whose images can be accessed or viewed via the internet, programs instant messaging such as Yahoo Messenger, AOL Instant Messenger(AIM), Windows Live Messenger, and Skype, and others. The term "webcam" itself refers to the type of camera used for a web-based service. The webcam itself is usually used for remote conference purposes or also as a monitoring camera [3].



Figure 1 Webcam

Radio Frequency Identification

Radio Frequency Identification is a wireless technology that utilizes electromagnetic waves (RF). This RFID technology is able to automatically identify the presence of a person or an object by transferring information from an RFID Tag to a reader [4]. In Figure 2, is the RFID RC522, in this device the function of RFID is to activate and deactivate is the device.



Figure 2 Radio frequency identification RC522

Magnetic Sensor MC-38

Magnetic Sensor MC-38 is a door opening/detection module that works based on electromagnetic principles. Under normal conditions (sensors and magnets are not close together), the switch is in an open condition (*normally open/NO*). In the active condition when the

sensor and magnet are close together or the door is closed, the switch is in a closed *circuit with* a resistance value of $\pm 4\Omega$ [5,6].

In Figure 3, the Magnetic Sensor MC-38 is used as a door position detector in the telecommunications engineering laboratory.

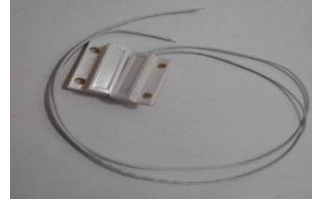


Figure 3 Magnetic sensor MC-38

Internet of Thing

Internet of Things is a structure in which the objects, people are provided with an exclusive identity and the ability to move data through the network without requiring both directions between humans that is the source to the destination or human interaction to the computer. *The Internet of Things* is a very promising scientific development to optimize life based on intelligent sensors and smart devices that work together through the internet [11,12].

3. DESIGN SYSTEM

Design is an activity to plan, realize and develop the function of a tool by considering the value for the user. To realize the tool made, the first step is to make a design or sketch as a basic reference in making the tool. The purpose of designing a tool is to facilitate the manufacture of tools, to get a good device as expected, taking into account the use of components that are economical and easily available in the market. A block is one of the most important parts in the design of a tool, because from this block circuit diagram we can know how the whole circuit works. So that the entire block diagram of the circuit will describe how the work of the tool is to be made.

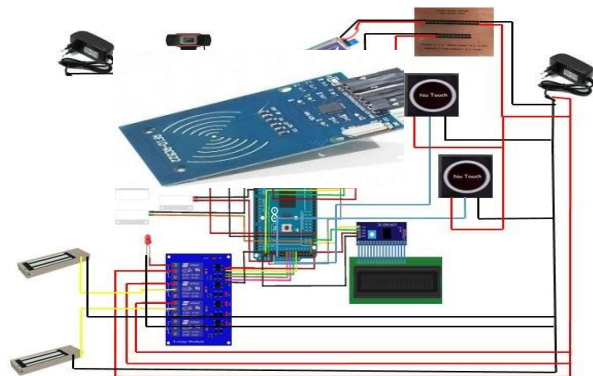


Figure 4 Circuit Diagram Design

4. CURRENT RESULT

Result of the design of a visitor limiting device that has been designed as a whole which will then be used to limit the number of visitors to the telecommunications engineering laboratory, so as to create a laboratory environment that is in accordance with health protocols.

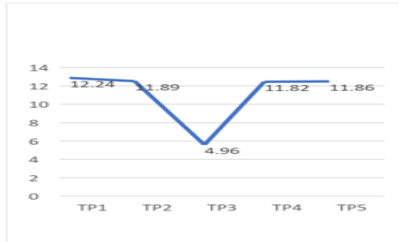


Figure 5 Rate voltage in active condition for Test Point 1, Test Point 2, Test Point 3, Test Point 4, Test Point 5

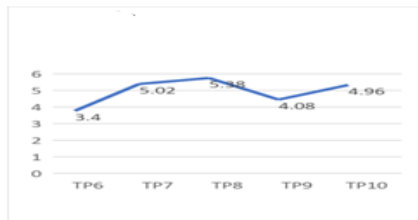


Figure 6 Rate voltage in active condition for Test Point 6, Test Point 7, Test Point 8, Test Point 9, Test Point 10



Figure 7 Rate voltage in active condition for Test Point 11, Test Point 12, Test Point 13, Test Point 14, Test Point 15

5. CONCLUSION

The hardware device that limits the number of visitors to this telecommunications engineering laboratory uses RFID (*Radio Frequency Identification*) to activate the device so that it can work.

This device limiting the number of laboratory visitors can limit the number of people in the laboratory automatically by locking the door when it has reached the maximum limit specified.

Webcam and Touchless function as a means of calculating the number of visitors to the telecommunications engineering laboratory which will then be displayed on the LCD.

This device limiting the number of visitors can be used to limit the number of visitors to the Telecommunications Engineering Laboratory so as to reduce crowds and create a laboratory environment that is in accordance with health protocols.

AUTHORS' CONTRIBUTIONS

Contribution to the authors is making research data collection and design program applications.

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In writing this paper, the researcher has conducted several sample trials with reference to references as reference material, to improve this paper.

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