JCI
Jurnal Cakrawala Indonesia
Vol.1, No.4, Desember 2021

APPLICATION OF INTERNET OF THINGS BASED ROOM SECURITY SYSTEM USING ANDROID APPLICATION

Oleh
Rafif Muhammad Irdian[1], Rafi Fredy Septianto[2], Aksen Winarto[3]
[1,2,3]Universitas Pembangunan Nasional Veteran Jakarta
Email: [1]rafif.muhammad212@gmail.com, [2]rafifredy79@gmail.com, [3]aksenw323@gmail.com

Article History:
Received: 04-09-2021
Revised: 15-10-2021
Accepted: 24-11-2021

Keywords:
IoT, Android, Arduino

Abstract*: Along with the increasing crime rate of data theft that occurs, it takes a good room security system to maintain data security for a particular agency or organization. Something A good security system is a security system that can be monitored and controlled remotely using the internet or better known as IoT (Internet of Things). In this thesis will designed an IoT-based room security system using the Android application, this system works using several modules including RFID (Radio Frequency Identification) module, camera module and door lock solenoid. The RFID card in this RFID Module functions as an identification process for people who want to enter into the room. In addition, this RFID module also functions as a trigger for the camera to work to take pictures a picture of the person who wants to enter the room. The data obtained from the two modules later will be sent into the Android application. The admin of the room can carry out the verification process to allow or deny people who want to enter the room. The results of testing this system can be runs well when the internet speed of the access point is fast and stable, but less optimal when the internet speed of the access point is running slowly.*

INTRODUCTION

The security system is used for provide protection for an object where an object contains something that is felt very valuable and need to be given security such as a building, place as well as those deemed valuable. Because of that a security system is needed to prevent someone commits a good crime theft or crime. Specifically in areas that are less quick to handle when an act of crime occurs because it will be detrimental when what is considered valuable is lost.

The system used for research This is a home security system. we all believe that home is the safest place and convenient for storing valuables. Security system made for carry out a control over someone in monitoring the movement of people who will enter the house in doing a prevention of something that is not desired by the owner of the house, for example a thief and other criminal acts. It is made using wemos d1 (as IoT system)

Cameras as surveillance media, sensors IR and buzzer as an alarm when there is something force entry into the house or bypass censorship IR. The advantage of this system is that this system can carry out supervision of people who will enter the house or pass through sensors that are install

and can turn on the alarm and lights automatically. While in this study, the system simpler designed security because it only uses wemos d1 and used SD Card Shield as media data receiver from vc0706 which was created 96 stored on the SD card and the lamp, the buzzer will turns on automatically when there is something forcibly enter

Security system in general is to secure an object where the object contains important things to be secured such as a house, room, building or other things. A security system is needed to prevent crime of theft or other criminal acts, this is made to prevent the crime rate of theft which is increasing from year to year. In this research, the security system created is a security system that will implemented in the server room, as we know the server room is a room where important data is stored from an agency or organization certain. This security system is used to monitor people who want to enterinto the room to prevent unwanted things such as theft data or data manipulation. This system is made using RFID (Radio Frequency Identification), cameras as surveillance media and Android applications as controller of access rights to enter the room based on the Internet of Things.

The advantage of this system is that this system is able to monitor people who want to enter into the room and able to control a functioning door lock system to restrict people from entering the room. security system in general is to secure an object where the object contains important things to be secured such as a house, room, building or other things. A security system is needed to prevent crime of theft or other criminal acts, this is made to prevent the crime rate of theft which is increasing from year to year.

In this research, the security system created is a security system that will implemented in the server room, as we know the server room is a room where important data is stored from an agency or organization certain. This security system is used to monitor people who want to enter into the room to prevent unwanted things such as theft data or data manipulation. This system is made using RFID (Radio Frequency Identification), cameras as surveillance media and Android applications as controller of access rights to enter the room based on the Internet of Things.

The advantage of this system is that this system is able to monitor people who want to enter into the room and able to control a functioning door lock system to limit people entering the room.

RESEARCH METHODS

In the discussion of the design of an Internet of Things-based room security system by using this Android application the research method used is descriptive method, where this research is based on current phenomena. The first thing in the design of an Internet-based room security system of The thing with using this Android app is component installation hardware of this security system. The first component to be designed ismRFID, RFID functions as a room entry permit from the owner of the RFID card andmafter that do the installation of a camera that works to take pictures of the person who entered the room then after that the installation of the arduinomfunctions as processing of any hardware components that have been installed.

DISCUSSION

After the hardware component design stage is complete, the next step is The next step is the database software design stage which aims to a place to store identity data from the owner of the RFID card and so on Android application design that functions as a notification to the admin or owner the room. Then after that, the component testing phase of the system is carried out security to ensure that the components are running in accordance with the design concept. how the system

works can be seen in Figure 1. below.ut The way this system works is that it is intended for clients who want to enter room when people enter using a card affixed to an RFID card reader then the RFID card reader will automatically give orders to Arduino to Internet Of Things Based Room Security System Using Applications Android take pictures of people who want to enter the room through the camera which is located on the side of the upper door. After the picture is taken, the Arduino will processing the data from the person's cards and pictures, then sending the data into the Android application and simultaneously Arduino also sends notifications to in the Android application for the data verification process carried out by the admin ofthe room. In the Android application notification consists of the name, ID number, card number and picture of the person who wants to enter then in the application, the admin has the right to grant access permissions or deny that person's permission to enter the room. After data images and RFID data received by the admin can enter the data into the database.

However, on admin login access, a keypad will be added which is located on the in front of the door of the room, where this keypad functions as a password when the internet is on the state is off, causing the data verification process. This password will later be used as a process to enter the room when the internet is off and only known by the admin from the room.

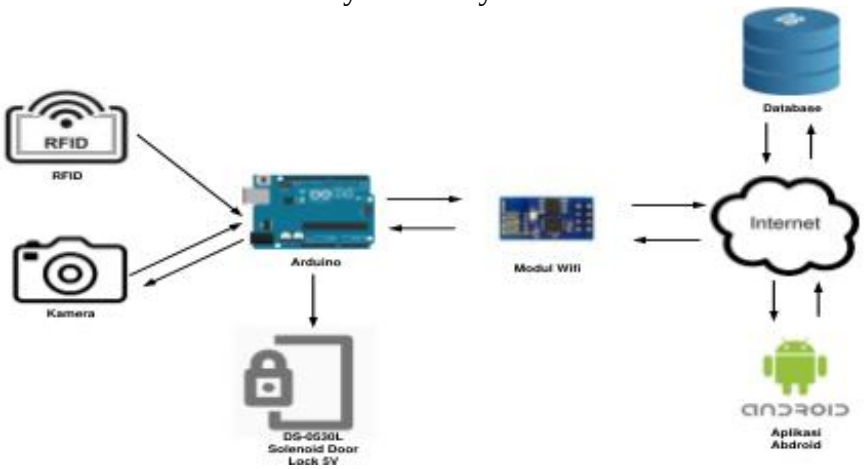

Figure 1. System block diagram

Interconnect

The interconnection network used is the Internet (Interconnection Networking). As in Picture

Figure 2. Network Interconnection System

Figure 2 is an interconnection of several devices used in one network Interconnection Networking (Internet), to be able to communicate with each other. The server on this system functions to wait

for incoming input from Arduino or Arduino from the android application, the server here uses a Public Static IP so that the process sending data from arduino or android applications is only intended for one address server that is the Public IP. After a data transmission process occurs, the server holds the input for a while then sends it into the output that each target.

Input Model from Arduino to Android Application

The input in question is in the form of a command from the results of keystrokes made by the admin which is then responded by the Android application, the response from the Android Application. This is in the form of sending a url over the internet. Figure 5 is the input process from Arduino to the android application, on this system it can be seen that the data sent is in the form of image data in .jpg format and ID number data of the RFID card. When the object wants to enter the room, the RFID sensor will detects the card affixed by the object, in each RFID card there is already a card identity number embedded in it so that the RFID reader can read the identity card number, after the identity number is obtained by the sensor, the next step is that the reader will also be a trigger for the camera inside take a picture of the object so as to produce image data in .jpg format. the data obtained from the RFID and the camera will then be forwarded by arduino to the server. after the server obtains the image data and identity number card, then the server passes the data into the android application.

Figure 7 is a block diagram of the input model for sending data from the application android into arduino, this input model explains that when the user presses command button "granted" or "decline", the android application will initialize the command pressing the button in accordance with the existing library in the application program android, for example if the user presses the "granted" button then the command will initialized by the android application into the letter "ACK" character this is what later sent to the server and forwarded to the arduino, in the arduino library the character has been initialized to function to open the door of the room, vice versa too with the "decline" button command, it has been initialized by the android application to become The character of the letter "DND" is this character which will later be forwarded to the server and then to the arduino and initialized by the arduino library which functions to close the door.

Figure 9 is a picture of the process of the system. How it works if there is input that the server sends into the arduino, the arduino will immediately process the input according to the input received, then after that arduino will match or verify that the input matches the libraries that have been created for the system If the input received by Arduino is in accordance with the commands on the library, then Arduino will activate the output pins of the received input.

Output Model

Model of the output of the system. System work on this output is arduino will provide or disconnect the voltage on the relay according to input command received, so that the relay will do the opening or closing solenoid door lock. Likewise, the 16 x 2 LCD will receive a command signal in the form of display on the screen if the door is open or the door is closed.

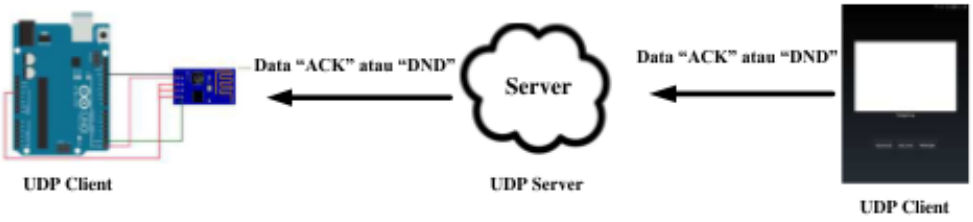

Figure 3. Block diagram of communication between arduino client to android

Testing the Distance Between Smartphone and Access Point The purpose of this test is to measure how successful the system is based on the distance between the smartphone and the access point. After taking measurements internet speed obtained the following results, download 20 Mbps and upload 4.59 Mbps

CONCLUSION

The conclusions obtained after testing this system are:

1. Successfully made an application by utilizing the internet to monitor andcontrol a security system in the room.
2. With the use of this internet, the admin can monitor and control the system in the room remotely and not limited. The tests that have been carried out show that the orders sent from the android application into the server can control the door lock system installed using a microcontroller by utilizing the android applicationcreated in Droid Script.

REFERENCES

[1] Ramadhan, A. S. Design and Build an Arduino-Based Home Security System Mega 2560. Informatics Engineering, Faculty of Computer Science, Dian University Nuswantoro Vol 15 No 2, May 2016.
[2] M.Chamdun, A. F. Rochim, E.D. Widianto. Layered Security System Room Using RFID (Radio Frequency Identification) And Keypad To Open The Door Automatically. Journal of Technology and Computer Systems Vol 2 No 3, 2014.
[3] Panduardi, F. Wireless Smart Home System Using Raspberry Pi Based Android. Informatics Engineering Study Program, Banyuwangi State Polytechnic Vol. 03 No. 01, July-December 2016.
[4] F. Susanto, M.N. Rifai, A. Fanisa. Internet of Things in Security System Room, Case Study Raharja College Server Room. in seminar National Information Technology and Multimedia, 2017.
[5] Sutopo, P. Executive Information System of Motor Vehicle Sales Distribution Two Wheels In East Kalimantan Web Based. Mulawarman Informatics Journal Vol. 11 No. 1, February 2016.
[6] Hidayatulloh, S. Internet Of Things Bandung Smart City. Faculty of Engineering, BSI University Vol.3, 2016.
[7] Putra, I. G. P. M. E. Monitoring the Use of Electric Power as Implementation Internet of Things Based on Wireless Sensor Network. Electrical Technology Vol. 16 No.03, 2017.
[8] Nugroho Adi Trio., et al "System Model Room Security Using GSM Shield And CCTV Camera Based Arduino", Pakuan University, 2016
[9] M. P. T. Sulistyanto and D. A. Nugraha, "IOT (Internet of Things) implementation in university study Kanjuruhan Malang," SMARTICS Journal, pp. 20-23, 2015
[10] Sulaiman Oris Krianto, Adi Widarma, "INTERNET OF THINGS (IOT) SYSTEM BASED ON CLOUD COMPUTING IN CAMPUS AREA NETWORK", Medan State University,2017
[11] Tri Rahajoeningroem, Wahyudin "HOME SECURITY SYSTEM WITH MONITORING USING THE NETWORK MOBILE PHONE", University Indonesian Computer ,2013
[12] Eka Permana, Ridwan Hidayat "SYSTEM DESIGN HOME BASED SECURITY SMS GATEWAY USING MICROCONTROLLER", STMIK Subang, 2017
[13] Indonesian Wikipedia, "Security", Wikipedia, [Online]. Available:

https://id.wikipedia.org/wiki/Security. [Accessed: 3-January-2019].
[14] Shofia Khoirunnisa, "SYSTEM PHERE RATE MONITORING BY USING INTERNET OF THINGS", BANDUNG STATE POLYTECHNIC, 2017
[15] Safei Imam, "Technology Development Arduino-Based Split Test Measuring Instrument And Sensor With Led Display", University Lampung, 2018.
[16] Farhan, "PHOTO TAKING REALTIME WITH USING COMMUNICATION WIRELESS", Batam State Polytechnic, 2017.
[17] Nugroho Dimas, "INTEGRATION TELEGRAM APP FOR MONITORING AND VEHICLE SAFETY Arduino BASED MOTOR DAN OPENWRT', Amikom University Yogyakarta, 2018.
[18] Diding Suhardi, "Controller Prototype LED Lighting (Light Emitting Diode) Independent Solar Powered", Journal of GAMMA, vol.10,No.1, pp. 116- 122, Sept. 2014.
[19] POLSRI Repository, "Arduino", POLSRI Repository [Online]. Available: http://eprints.polsri.ac.id/3625/3/FILE%2 0III.pdf [Accessed 28-Dec-2018]