

COVER LETTER

Yusnita Rahayu
Universitas Riau
yusnita.rahayu@lecturer.unri.ac.id
+62-8117573112

February 25th, 2022

Dear,

I wish to submit an original research article entitled "Design and Development of Smart Lock System Based QR-Code for Library's Locker at Faculty of Engineering, Universitas Riau" for consideration by SINERGI.

I confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere.

I confirm that we will continue to follow and carry out the process of this article in accordance with the provisions and are willing to accept penalties for not implementing them.

In this paper, I report on / show that:

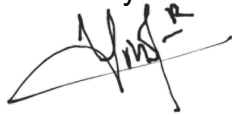
Topic	:	Design and Development of Smart Lock System Based QR-Code for Library's Locker at Faculty of Engineering, Universitas Riau
Brief Background	:	Some studies regarding the implementation of QR codes have been discussed by Rao et al, which explains the use of QR codes as car door security. This research was conducted by adding Atmega328P to the Arduino Uno as a microcontroller and the HC-05 Bluetooth module as a wireless communication tool. The system can rotate the servo motor (Micro servo DXW90) about 180 degrees (90 degrees per rotation) which are used to open and lock the car door. The last door lock has been programmed with encrypted data and will later be matched with the lock application; thus, it is challenging to hack while the application design is done using the MIT App inventor. Also, a study from Al-Ghaili et al. researched the use of QR codes for the Smart Verification Algorithm (SVA) on the Internet of Things (IoT). The proposed application carries out verification procedures to activate the user request authorization feature to access the smart system with the help of Encrypted QR tags. The access and services of the library are continuously evolving and changing based on the current technology available in the market. Traditional lockers exist on university campuses, but they are neither convenient nor secure. So this research will be using the android application provided for users to scan QR codes and create and validate an account to prevent door access by irresponsible parties. This process can only

		be accessed on the user's mobile device. Then, an additional security login level and an email notification are also added. This research is located in the library of engineering faculty, Universitas Riau.
Research Problem	:	The current security system in the locker's library of engineering faculty, Universitas Riau, uses a conventional or physical key. A physical key is a standard security system because it is very cheap and easy to use. Still, if it is implemented in a public space like a library, physical keys have several weaknesses, such as when visitors bring the key, there is a risk of losing it or being carried home. Furthermore, there is no verification for visitors' data to access lockers. The keys can be duplicated easily, making this current security system vulnerable to theft if applied in public spaces. For this reason, in this research is very necessary to add some new improvements to the security system to prevent something terrible from happening in the future.
Overview of Method	:	This smart lock system is designed to control the locker lock using a QR code as the key. To make a QR code is available to access, an android application and database are needed. The database uses MySQL, which has many tables for user data and controls the locker system. Android application is needed for user interface and scanning QR code. The QR code will be pasted in front of the locker door. Before scanning, students must register themselves in the application and verify their data by submitting their Student Identity Card to the library officer to verify their identity as a student. It will prevent irresponsible parties from getting access to the lockers. This device requires several main components such as NodeMCU ESP8266 module, solenoid, power switching adapter (PSA) 12V, DC-DC step down (module AMS1117) with outputs of 3.3V and 5V as well as relays of 5V and Solenoid 12V.
Significant finding	:	For the delay results, if measured by day, the lowest delay occurs on Thursday around 0.8 seconds with two lockers are accessed and the highest around 3.36 seconds when three lockers are accessed. This delay happens on the same day. While if delay measured by the hour, the lowest delay is measured about 0.86 seconds at 01.00 PM with two lockers are accessed, and the highest is 3.15 seconds at 02.00 PM with three lockers are accessed. The delay on the device is still categorized as "Bad," with an average delay time of 1.66 seconds. This will affect the length of time it takes to scan the QR code. Besides, significant issues while measuring delay data are that the quality of Wi-Fi networks at the library is unstable, affecting the measurement results because it is a public network. Moreover, during lunch break time, delay's value is higher than other times caused by heavy traffic on Wi-Fi networks. The solution to reducing delay's value is using a private network or a priority network for the devices separated from the public network, so the load on the traffic network can be reduced and obtained delay's value.

We have no conflicts of interest to disclose.

Thank you for your consideration of this manuscript.

Sincerely,
Yusnita Rahayu



AUTHORSHIP STATEMENT

I/We wish to submit an original research article entitled “[*title of article*]” for consideration by SINERGI.

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript.

Author 1		
Name	:	
Affiliation	:	
Email Address	:	
Author 2		
Name	:	
Affiliation	:	
Email Address	:	
Author 3		
Name	:	
Affiliation	:	
Email Address	:	
Author 4		
Name	:	
Affiliation	:	
Email Address	:	

POTENTIAL REVIEWERS

Please submit 3 (three) potential reviewers (*that have not listed in SINERGI*) to speed up the review process that competent for the topic and has a good reputation in that area.

Reviewer 1		
Name	:	
Affiliation	:	
Email Address	:	
Reviewer 2		
Name	:	
Affiliation	:	
Email Address	:	
Reviewer 3		
Name	:	
Affiliation	:	
Email Address	:	