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Monitoring the security system at pistol storage based on a web server in Army Units

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ABSTRACT

The employment of security features is crucial to the operation of many modern electronic gadgets in the current 5.0 era as time and technology advance. This means that we must keep coming up with new ideas and producing instruments that will enhance security. Among the many issues that come up is the fact that guns are still registered, checked out, and returned using public books, which leaves space for data tampering or the chance that the books are lost. The primary goal of this research is to create and execute a web-based system that uses fingerprints to monitor the borrowing and return of firearms. Because of its nature online-his, this system will streamline operations and enable users to conveniently view inventory from any location. Researchers employ literature methodology, which includes reading, debating, synthesizing, and developing the concepts employed, in addition to employing laboratory techniques and the necessary tools to accomplish their objectives. The web server on which the security monitoring system for keeping firearms is based has undergone extensive testing and analysis, and the findings indicate that generally, the device can operate as intended. This conclusion is based on traffic analysis and access patterns on the web server. Following the completion of five tests with a 95% accuracy rate. Finally, the security monitoring system for the storage of firearms is based on a web server and has undergone extensive testing and analysis with a 90% speed and accuracy rate; the findings indicate that, on the whole, the instrument can perform as intended.

Keywords: Electronics; technology; inventory; web; online.

1. INTRODUCTION

The employment of security features is crucial to the operation of many modern electronic gadgets in the current 5.0 era as time and technology advance [1][2]. This means that we must keep innovating and producing tools that will enhance security [3]. There are restrictions on the usage of security systems in electronic devices, including laptops, tablets, cell phones, and other gadgets [4]. User data must be obtained through a validation process before the security system may be accessed [5].

As information technology has advanced, several electronic-based industries have evolved, including e-Government, e-Commerce, e-Education, e-Medicine, and e-Laboratory [6]. This technology makes use of a network system to link computers according to requirements, a collection of computers for data processing, and telecommunications technology to distribute and access data globally [7]. Multiple application services can be hosted on a single machine, depending on the network's complexity. Here, numerous servers collaborate to offer data and services to numerous clients. This is made feasible

by the fact that each server can be set up to perform a certain number of services, with other servers handling the remaining tasks [8]. Database servers (including Oracle, Postgres, MS SQL Server, MySQL, and Interbase) and other centralized servers for data dissemination and storage are instances of this kind of server [9][10].

For storing a lot of data, servers are the best option, particularly for storing firearms [11]. Consequently, to control the flow of weapons into and out of storage facilities employing this technology, a more robust security system is required [12]. One of these responsibilities is guarding weapons, particularly handguns kept in warehouses for use by Indonesian Army units. When administrative data collecting about weapons loans and returns is still done by hand, namely by entering the information in a general book, it leaves room for data manipulation [13]. Web server-based monitoring can confirm that weapons that are available and unavailable can be tracked in real-time in this manner [14]. Web server technology, which enables the online and real-time collection of administrative data, is therefore necessary to tackle this issue [15][16].

2. METHOD

The idea or steps that will be used in the research are called the research framework. This phase will ascertain the outcome of a product that will be manufactured nearly entirely. In this design, many things must must be reviewed first**.**

2.1 Flowchart

Several strategies were utilized to collect data to ensure maximum results and accuracy when creating tools and working on this study report

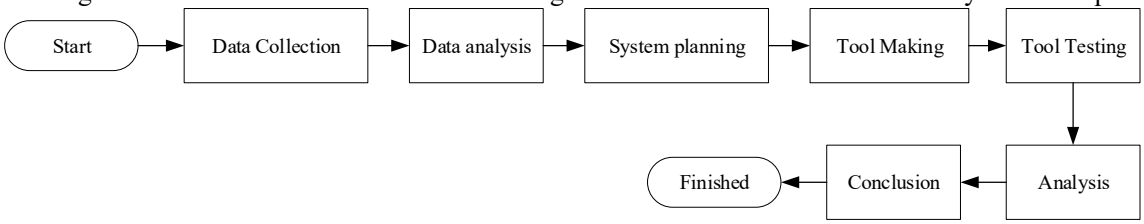

Figure *1*.

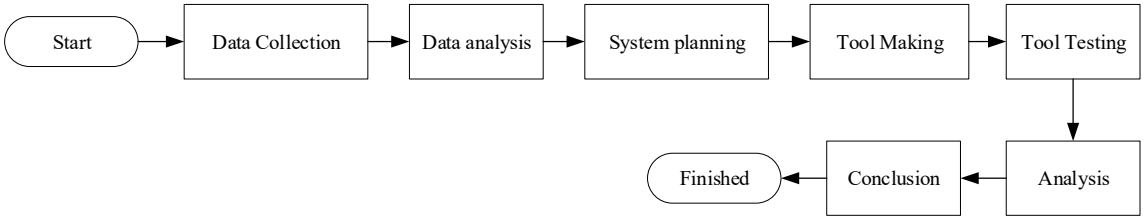

Figure 1. Flow diagram.

2.2 Library research

This strategy approaches the principles employed by conducting a literature review. By going through books and periodicals, having discussions, summarizing them, and drawing conclusions. Concerning the components that will be utilized in the analysis and creation of tools built using the Arduino programming technique, as well as the programs and tools that will be developed [17].

2.3 Laboratory research

This method is carried out to test existing concepts using appropriate equipment. The objects tested were hardware and software specifications and tools used in this research.

a. One Asus A420 Laptop Unit
b. Arduino ESP32 module
c. Arduino IDE application
d. Fingerprint sensor

3. RESULTS AND DISCUSSION

Testing and measuring are the next steps after the tool's planned construction is finished. To comprehend the features of each overall tool function, this step is required.

3.1 How the tool works

A web server was created for this study to track user activity in real-time to see who is borrowing and returning guns. The idea behind this web server system is to document the loaning and returning of weapons to users while also making it simpler for owners of weapons warehouses to monitor the activity of these users [18]. User information is saved at the time of registration. After that, all the user needs to do to gain access to borrow a weapon is log in.

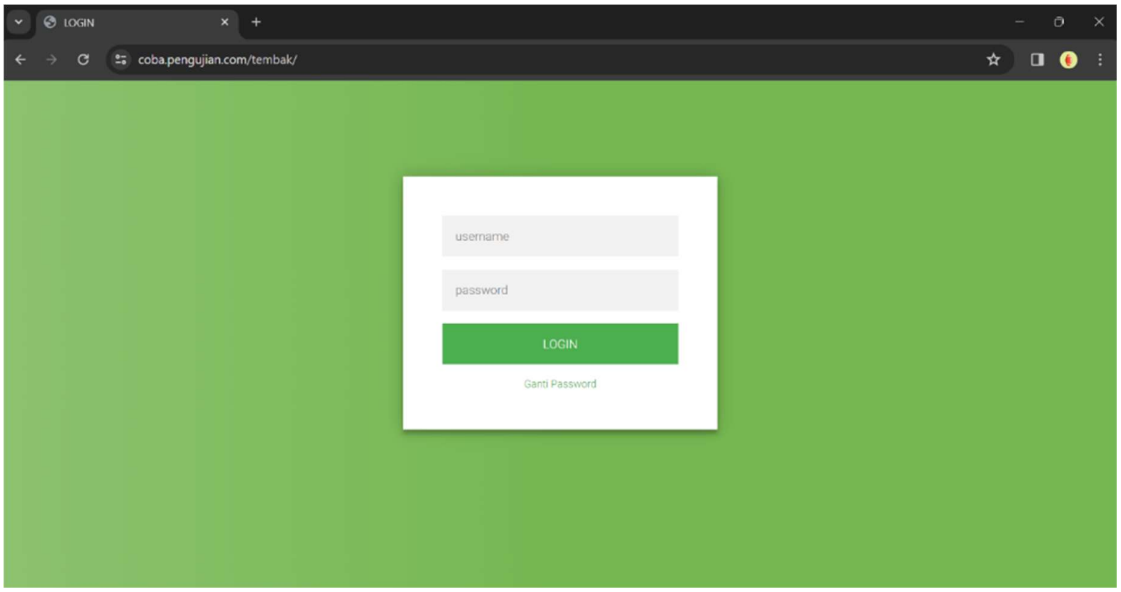

Figure 2. Server login in the menu display.

Figure 2 shows the server login on the monitor screen, requesting that the user provide login credentials (password and username), and granting access only after confirmation.

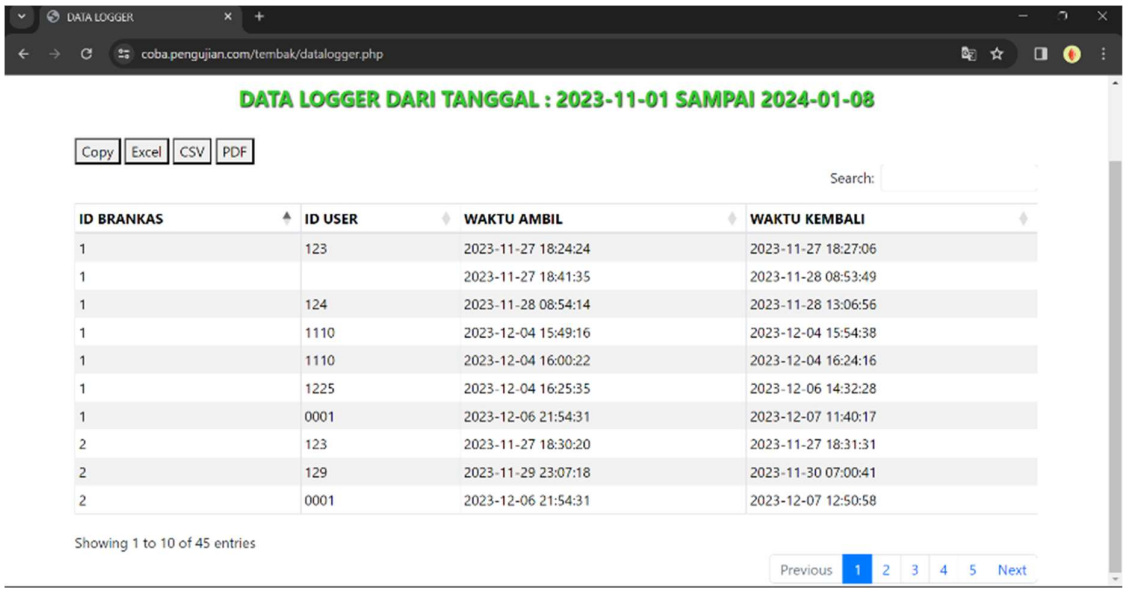

Figure 3. Monitoring history display which monitors user activity in real-time.

Real-time history monitoring, as shown in Figure 3, helps system managers identify behavior in the event of a security breach by keeping track of user activities and providing the most recent activity log, which includes information like the user's ID when to take and return a gun, and other details.

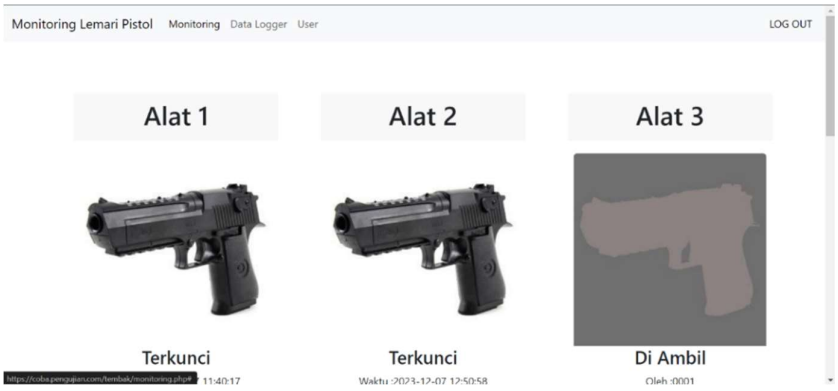

Figure 4. Display menu when the gun is available.

The menu criteria are explained in Figure 4, where a gun image is displayed on the menu if it is accessible. Figure 5 indicates that the pistol is either in use or unavailable.

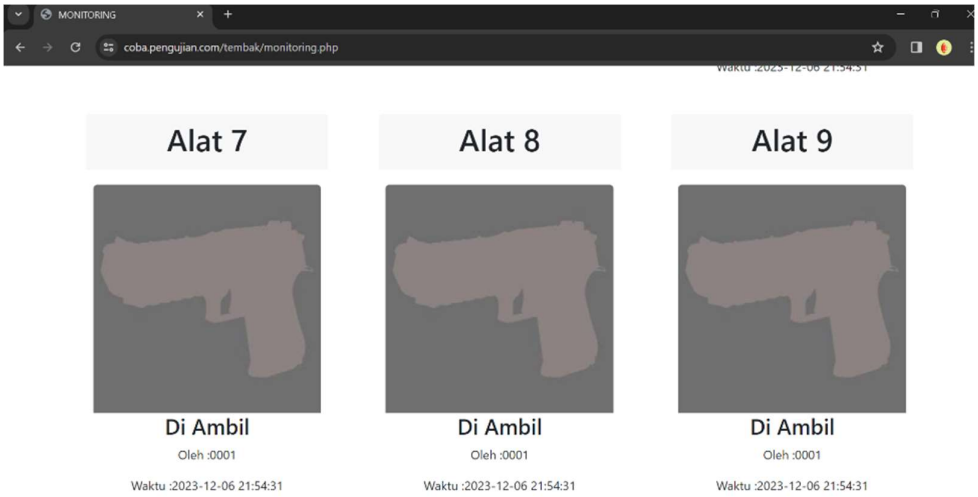

Figure 5. Gun display menu if not available.

3.2 Fingerprint test results

The test findings are broken down individually using the unique identification number assigned to each test that is conducted. The fingerprint condition refers to a unique feature or state of the fingerprint under examination. A wide range of circumstances, including wrinkled, soiled with dirt, clean, and synthetic fingerprints, may be covered by research. The system's accuracy in detecting fingerprints is demonstrated by the test results. If the fingerprint is successfully recognized and verified by the system, the test result can be documented as "Matched". On the other hand, if the fingerprints are phony, moist, or wrinkled and the system is unable to identify them, the test results may be recorded as "No". Table 1 then displays the testing experiments and data gathering.

Table 1. Fingerprint test results.

No.	Fingerprint Condition	Suitable/Not	Lock
1	Clean fingerprints	Suitable	Open
2	Wet fingerprints	No	Closed
3	Dust dirty fingerprints	Suitable	Open
4	Wrinkled fingerprints	No	Closed
5	Soil dirty fingerprints	Suitable	Open
6	Fake fingerprints	No	Closed

Three factors need to be considered when evaluating fingerprints: clean fingerprints, dirt dirty with dust, and with dirt. Five experiments with different fingerprint settings were conducted, and the results

showed that fingerprints have a 95% accuracy rate in identifying clean fingertips. Table *1* displays the test findings, which include the fingerprint reading time, for the web-based guns storage security monitoring system. With average read times of 2.5 seconds for clean fingers and 3.4 seconds for unclean fingers, data analysis validates system performance.

The analysis that follows testing reveals a thorough monitoring and assessment procedure for integrated security systems that store weapons in the military environment of the Indonesian Army. This procedure includes requirements identification, system design, implementation, activity monitoring, data analysis, threat follow-up, and ongoing evaluation and improvement. This study guarantees the highest level of protection and quick reaction to any threats.

4. CONCLUSION

According to the explanation provided in the earlier chapters, armory guards can complete the work reporting procedure more easily thanks to web server-based monitoring. This web server-based monitoring increases time efficiency when borrowing and returning guns by making it simpler to report the borrowing and returning of pistols.

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