Automation of Time Attendance Machine Data Acquisition through ADMS Features

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ABSTRACT

The purpose of this research is to provide convenience for institutions in monitoring employee attendance through the ADMS (Automatic Data Master Server) feature so that information related to measuring employee attendance levels in real time and reliable (cannot be manipulated) can be achieved. This research method uses the Waterfall method where the stages are through Data Analysis, Design, Object research, Implementation and system trials. The results of this study are the results of the implementation there are several conclusions obtained from the design activities of the electronic attendance application, namely the employee data synchronization feature can ensure that employee data in the electronic attendance system is the most up-to-date employee data without the need to re-enter employee data. The use of the ADMS feature in the finger print machine allows sending finger print data in real time, where finger print data that enters the finger print machine at that time can also be sent to the electronic attendance application server. Thus the attendance of each employee can be monitored in real time.

1. INTRODUCTION

In an effort to achieve work discipline to meet one of the factors that Schultz has conveyed, the accurate arrangement and recording of employee attendance in an organization is important. An attendance system that is not precise and accurate will be able to cause various problems, including (Mohamed & Raghu, 2012): First, conventional employee attendance recording tools require a lot of intervention from the personnel department and the honesty of the employees concerned. This often provides an opportunity for manipulation of attendance data if continuous supervision of this process is not carried out properly. Secondly, inappropriate recording of employee attendance can result in reduced employee motivation. This is because in-depth and detailed information about an employee's attendance can determine a person's work performance, salary/wages, productivity, or the progress of the agency/institution in general.

In its development, the need for employee attendance information is not only at the end of the month before payroll, but companies or organizations need employee attendance information every day or every time (realtime) to support the smooth running of the organization's activities. Through realtime employee attendance information, each part of the company/organization can make quick and precise decisions if there are activities related to absent employees (Bastina & Rama, 2017).

Fingerprint attendance machines have become one of the popular tools used by many companies and organizations to monitor employee attendance. This tool replaces manual methods

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such as attendance books, so it can save time and energy needed to calculate employee attendance. The way a fingerprint attendance machine works is quite simple (Cay et al., 2022; Yulianto et al., 2022). Each employee must register their fingerprints in the fingerprint attendance machine system. After the fingerprint is registered, employees can use the fingerprint attendance machine to scan attendance by attaching their finger to the attendance machine sensor, then the machine will read and verify the employee's fingerprint with the data that has been stored in the database. If the fingerprint is verified, the machine will record the employee's attendance in the system and store the data (Badr & Nasir, 2022; Nadhan et al., 2022).

The data capture/acquisition process on a fingerprint machine is generally done in two ways (Yulianto et al., 2022):

1. Through a USB flashdisk that is plugged into the fingerprint machine, then export data in csv format from the fingerprint machine to the flashdisk. After completing the data export, the USB flashdisk is plugged into a PC that has an attendance management application installed, then import data from the flashdisk to the PC.
2. Through the data download menu on the attendance management application installed on the PC and connected directly to the fingerprint machine.

The data retrieval model as above can only be done periodically, so it cannot present data in real time, because the availability of attendance data depends on the operator in charge of retrieving data.

ADMS Fingerprint (Automatic Data Master Server Fingerprint) is a technology that combines an automated data master server infrastructure with a fingerprint authentication system. This technology enables iClock ADMS software to automatically perform fingerprint verification and manage employee attendance data accurately and securely (Rajarajan et al., 2019). ADMS can also easily unify data from multiple fingerprint machines, so that attendance data management can be done centrally. ADMS through iClock ADMS can be applied on its own server, so that infrastructure and software development related to employee attendance information can be easily carried out (Fajriati & Budiman, 2021; Vidhya et al., 2022).

From these problems, this research aims to acquire employee attendance data in real time through the ADMS (Autometic Data Master Server) feature. This feature works as a substitute for operators in retrieving data. The way this feature works is that as soon as the employee checks the fingerprint, the attendance data is immediately sent by the fingerprint machine to the ADMS server automatically. The data is then stored in a database, so that it can be displayed at any time through the attendance management software.

2. METHOD

This research was conducted using the Waterfall software development method through the following stages:

2.1. Requirements

Analyze the needs of ADMS implementation and attendance management software.

2.2. Design

At this stage, the design of the ADMS installation flow is carried out, designing the interface of the attendance management software.

2.3. Development

At this stage, the ADMS server installation, Fingerprint machine configuration to activate the cloud server, and coding to create attendance data management software are carried out.

2.4. Testing

This stage tests the connectivity of the fingerprint machine to the ADMS server and ensures that the data on the fingerprint can be sent automatically to the ADMS server. In addition,

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testing data on the ADMS server can be read by the attendance management software that has been created. This test is carried out on a small scale.

2.5. Implementation

This stage is carried out testing involving several users (employees) to find out that the whole process is running well.

2.6. Maintenance

This stage is carried out maintenance to anticipate any obstacles outside of technical matters.

3. RESULTS AND ANALYSIS

3.1. System Requirements

The needs in this research include hardware and software as follows:

a. PC Core I3 RAM 4GB for ADMS server

b. X-100C Fingerprint Machine

c. iClock ADMS, PHP, MySQL and VS Code

3.2. System Design

a. Flow Chart of Fingerprint Data Acquisition through ADMS

The flow of the fingerprint machine starting from employees scanning attendance, automatic acquisition by the ADMS server until a realtime attendance report is obtained is shown in Figure 1.

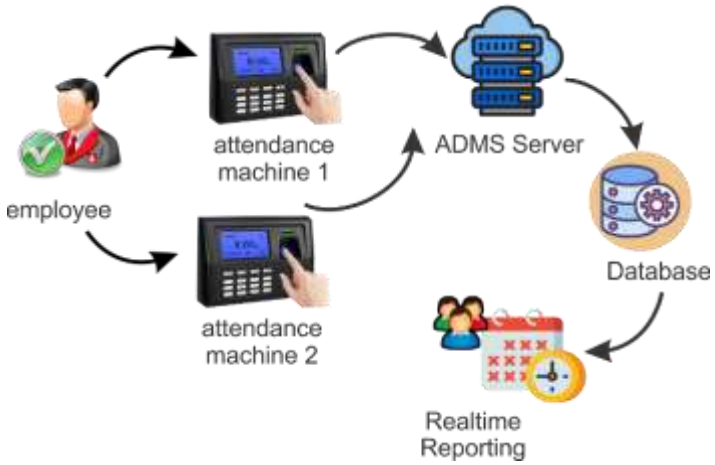

Figure 1. Flow of Attendance Machine to ADMS

Description:

1) Employee
   Employees scan their attendance to the attendance machine (Fingerprint) by using fingerprints or face scans. Attendance scans can be done on multiple fingerprint machines as long as they are connected to the same ADMS server.
2) Checklok (Fingerprint) Machine
   After the employee scans attendance, the data will automatically be submitted by the fingerprint to the ADMS server. To be able to send data to the ADMS server, the fingerprint machine must be set to the IP address or domain of the ADMS server PC.

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3) ADMS Server (Automatic Data Master Server)
The ADMS server receives attendance data from the fingerprint machine and stores it in the database.
4) Database
The database uses mysql as a place to store employee attendance scan data that is easily accessible from various platforms.
5) Realtime report
Reports can be printed at any time with the latest data sources from the database, because every employee scans attendance data directly stored in the database. This reporting process uses the attendance data management application.

b. Design of attendance report management application

The attendance report management application is used to print attendance reports from employees. This application is used by operators with several menus including the employee menu to input employee data, the Employee Shift menu to schedule employee attendance, the Department Master menu to determine the type or group of employees, and the attendance printing menu to print employee attendance. The design of the software flow for managing employee attendance reports is presented in the form of a usecase diagram which can be seen in Figure 2.

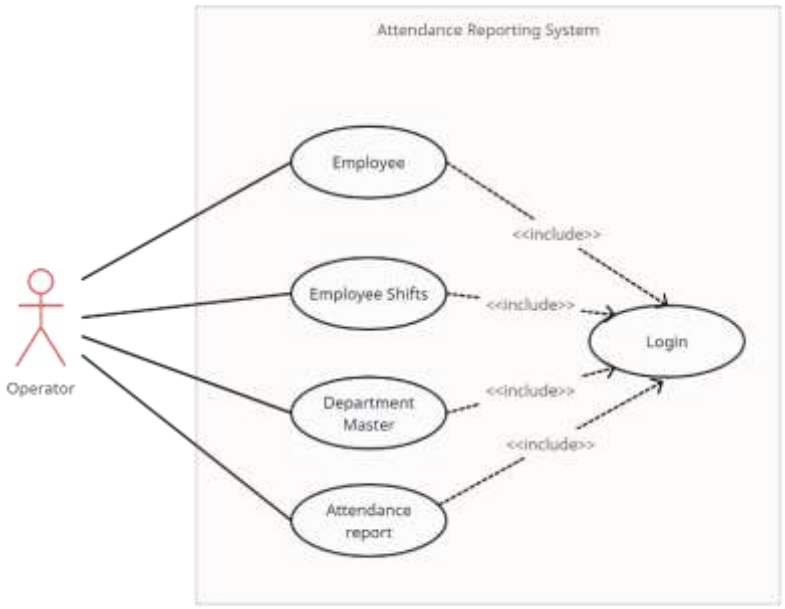

Figure 2. Use Case Diagram of Attendance Reporting Application

3.3. Implementation

a. ADMS Server Installation Results

1) Device Menu
The device menu is used to find out the number of fingerprint machines detected on the ADMS Server. The Append button is used to add fingerprint machines, the clear All button to delete machines. The display of the Device menu can be seen in Figure 3.

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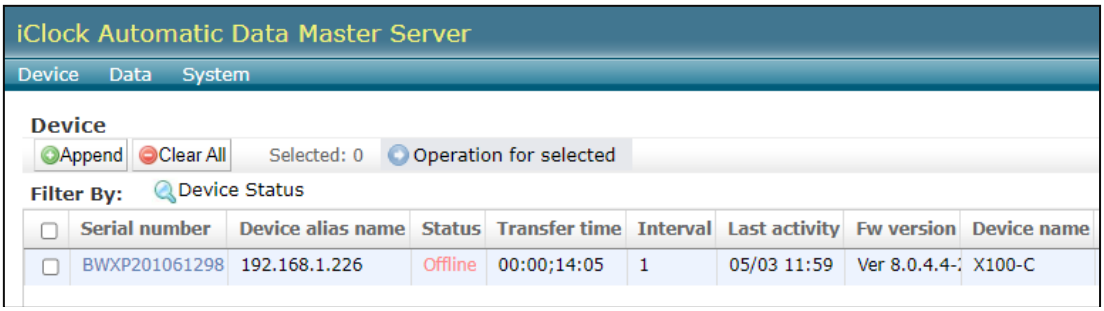

Figure 3. Device Menu on ADMS Server

2) Transact Monitor Menu

The transact monitor menu is used to display the transaction of sending attendance data that is currently running. This display is realtime, always updated when an employee scans attendance. The display form of this menu can be seen in Figure 4.

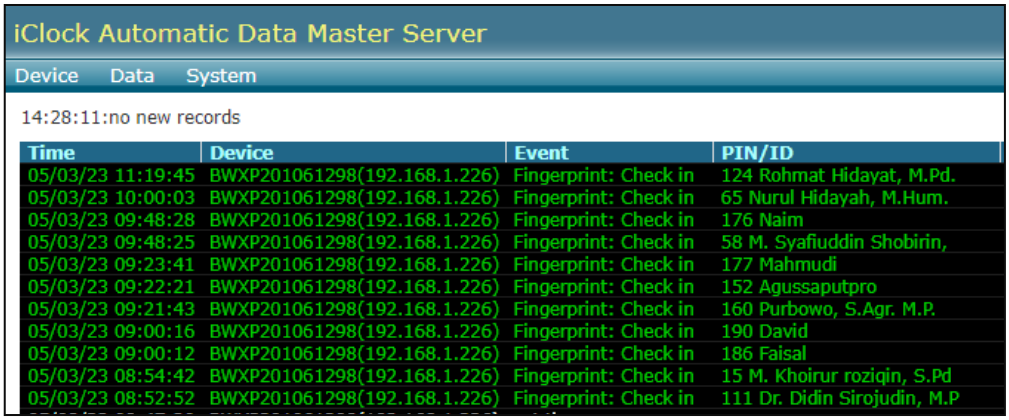

Figure 4. Transact Monitor Menu on ADMS Server

b. Attendance Reporting Application

This application is used for employee management, shifts, departments and employee attendance reports. The use of this application is through authentication by entering a username and password on the login page. The display form of this application can be seen in Figure 5.

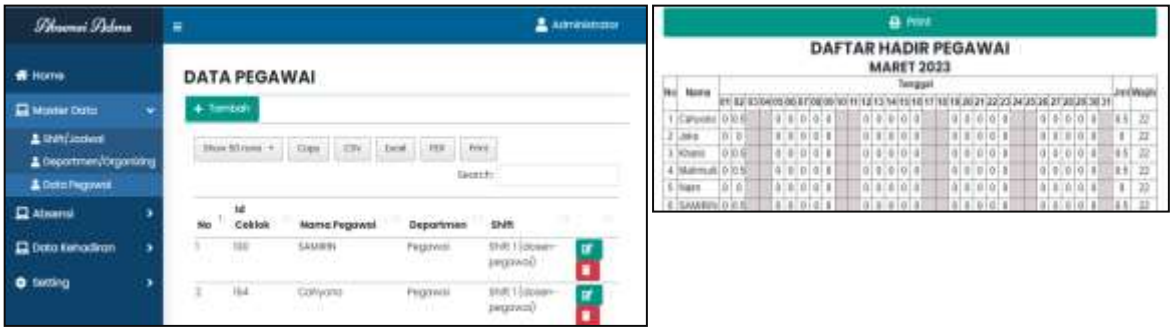

Figure 5. Display of Attendance Reporting Application

3.4. Testing Results

The test results include two data, namely testing sending data on the fingerprint machine to the ADMS server and testing the attendance reporting application.

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Table 1. System Testing Results

Tested Form	Expected Results	Testing Results	Results
Fingerprint Connection to ADMS Server	The ADMS Server can recognize the Fingerprint machine when the IP Address setting on the Fingerprint machine is adjusted to the ADMS Server IP Address	ADMS Server can recognize Fingerprint machines that have been IP Address matched with ADMS Server	Retrieved
Data Transmission to ADMS Server	The ADMS server can receive attendance data shortly after employees scan attendance	The ADMS server can receive attendance data shortly after employees scan attendance	Retrieved
Operator Login	If the operator successfully logs in, the admin dashboard page will appear and if it fails, an incorrect username or password message will appear	Operators who successfully log in appear on the admin dashboard page and when entering the wrong username or password a message appears indicating the error	Retrieved
Employee Data	Operator can CRUD employee data	Changes in employee data after CRUD	Retrieved
Employee Shift Data	Operator can perform Employee Shift CRUD	Changes in employee shift data when CRUD is performed	Retrieved
Department Data	Operator can CRUD Department data	Department data changes when CRUD is performed	Retrieved
Print Attendance	Operator Prints Employee Attendance Data	Employee or Employee Attendance Record Data Appears and is Printed	Retrieved

In testing the connection of the fingerprint machine to the ADMS Server using 2 fingerprint machines. Every connection that is connected, the ADMS Server will display all employee data, both attendance logs, profile data and fingerprint templates on the fingerprint machine, and vice versa, employee data on the ADMS server will automatically enter the finger machine (see Figure 6) (Pertama, 2019; Yulianto et al., 2022). So if there is a fingerprint machine that contains different employee profiles with the same ID number, it will cause employee data on the fingerprint machine to overlap. Therefore, to add a fingerprint machine to the ADMS server, you should use a machine that is still empty, because it will be filled with employee profile data automatically from the ADMS Server.

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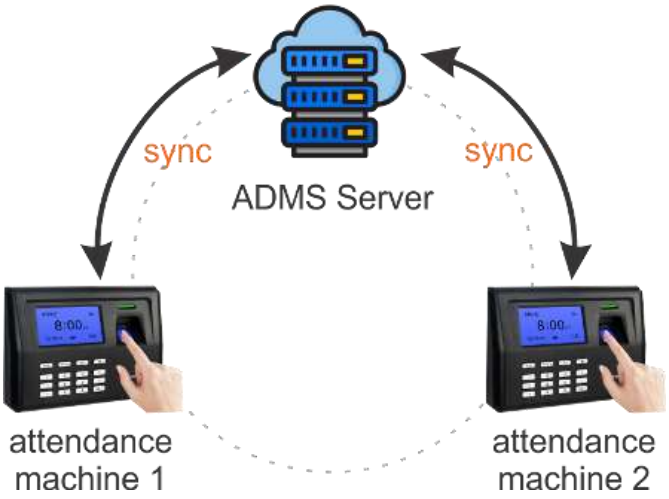

Figure 6. Synchronize Fingerprint Machine with ADMS Server

4. CONCLUSION

From the test results, the use of a fingerprint machine that has been connected to the ADMS server can provide realtime data acquisition. Employees who have scanned attendance on the fingerprint machine automatically have their data sent to the ADMS server. This certainly facilitates the development of systems related to the need for employee attendance information at any time. Each fingerprint machine connected to the ADMS server will synchronize data automatically so that each fingerprint machine will contain the same employee profile data. This makes it easy to maintain when there is an addition or replacement of fingerprint machine devices, however, to add a new machine in it must be empty to avoid invalid employee data.

5. DECLARATION OF COMPETING INTEREST

We declare that we have no conflict of interest.

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