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Implementation of Agile Method in Employee Attendence Information Systems

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ABSTRACT
Employee attendance is a record of a person's attendance time in a document that is properly prepared as a reference in making decisions within the scope of research. In Perhentian Marpoyan Village, the employee attendance system used is still manual, which can lead to loss or damage of existing data, lack of efficiency and effectiveness in data processing, and inaccuracies in the data. Based on these problems, a Web-based Employee Attendance Information System was created at Perhentian Marpoyan Village. The method that researchers use to create this system is the Agile Development method and uses OOAD (Object Oriented Analysis Design) modeling. This web-based employee attendance information system will be able to provide convenience in the employee attendance process, search for attendance data and minimize loss and errors in recording attendance data at Perhentian Marpoyan Village.

Keywords: *Information System, Employee Attendance, OOAD, Agile Development*

1. Introduction

The rapid advancement of technology today undoubtedly facilitates the acquisition of information in a swift, effective, and efficient manner. Current developments in the field of computing provide opportunities for decision-making within agencies, organizations, and companies to solve problems using computer science (Wahyuni, 2022). The evolution of this technology must be paralleled by advancements in Human Resources (HR) management. One such user of information technology is Perhentian Marpoyan Village.

Perhentian Marpoyan Village is one of the local government agencies in the Marpoyan Damai District, Pekanbaru. It comprises six departments or positions staffed by eight employees: a village head, a secretary to the village head, heads for social affairs and governance respectively, a development head, an office staff member, an office guard and a cleaning officer. All employees at Perhentian Marpoyan Village record their attendance every working day.

Attendance data is crucial as it determines employee participation within an institution or agency's activities. Its use promotes employee discipline to bolster organizational performance (Ruslan, 2019). Henceforth, information about employee attendance is vital for any agency or authority.

Currently at Perhentian Marpoyan Village however,the attendance system remains manual. This affects not only the process of compiling employee attendance but also report generation which are typically hardcopies that can lead to data recording errors. It complicates data retrieval processes and could result in loss of staff attendance records. To address these issues researchers have developed a web-based employee attendance information system designed to

enhance effectiveness in data processing as well as improve efficiency particularly with respect to report compilation.

To boost effectiveness and minimize existing issues at Perhentian Marpoyan Village it was first necessary to identify problems within their current system through analysis using the Pieces method - an assessment tool used when considering system construction suitability (Putra et al., 2021). This method incorporates six variables: performance; information; economics; control; efficiency; service.

The following outlines results from analysis conducted on their current system using Pieces methodology based on interviews with approximately 30 individuals: Firstly with respect to performance analysis it was found that because their manual employee attendance information system still utilizes paper forms it significantly impacts performance particularly when employees are filling out absence forms. Secondly during informational analysis it was noted that currently all employee attendances recorded on paper must be manually entered into their system. Thirdly economic analysis revealed that considerable costs are incurred procuring paper and other stationery items leading not only high expenditure but also frequent errors. Fourthly control analyses indicated lackluster data security controls which can compromise existing institutional or agency data. Fifthly efficiency analyses showed that despite control mechanisms being used there remain deficiencies particularly when filling out attendance forms. Finally service analyses revealed long delays obtaining requisite data due largely inefficient processes associated with current systems.

2. Literature Review

Yulistiawan (2011) suggests that design is a series of steps aimed at translating analysis and system results into programming languages. This helps in detailing how system components are implemented. Meanwhile, the concept of building or implementing can be understood as creating a new system or enhancing an existing one, either entirely or partially. In this regard, design is crucial for managing information that is comprehensive, quick and accurate across various sectors (Nurikawati & Rachmat, 2017).

Various sectors have started to develop technology through distinct information systems to stay competitive and improve their business operations. They aim to achieve efficiency and effectiveness through the utilization of information technology (Riswanto, 2019). According to Harkamsyah and Andrinof (2018), one key factor contributing to the success of organizations and companies is the role of information technology in their management. However, not all companies apply this use of information technology in various agencies including those related to employee attendance/staffing (Sikumbang et al., 2020).

A timesheet is a record for a large group within an official authority with rules, regulations, and restrictions that members are bound by. If these rules are violated by any member, sanctions will be imposed according to the rules enforced by the agency. Each agency has its own set of rules based on agreements made when individuals join that particular agency (Deka & Kadafi, 2020).

The village office holds governmental responsibilities including providing and enhancing services to the community as per Law No. 6 of 2014. Absenteeism and punctuality serve as indicators in employee performance evaluations (Bender, 2016). Essentially, employee attendance data is vital for both companies or government agencies such as Perhentian Marpoyan Village where currently attendance recording remains manual (Wijaya et al., 2020).

Perhentian Marpoyan Village office is one local government agency within Marpoyan Damai sub-district in Pekanbaru comprising six departments/positions staffed by eight employees: a village head; secretary; heads for social affairs; governance; development; an office staff member; guard; cleaning officer respectively(Saragi Napitu et al., 2020).

Attendance data serves as critical evidence when evaluating employee performance thereby providing leaders with material for assessment purposes. Evaluation data derived from

Perhentian Marpoyan Village's web-based employee attendance information system provides references for decisions regarding salary increments promotions or awards . It also aids decision-making when dealing with tardiness issues . Current systems provide reference points regarding employee performance reflecting human resource management within organizations/companies aiming at achieving good performances(Rokhmah & Muslihah ,2021).

So far, at Perhentian Marpoyan Village Office, half-time attendance has been adequately recorded. However, leave requests and approvals are not properly documented, leading to inconsistencies in employee attendance records. Therefore, a comprehensive attendance system is needed that can centrally manage employee data - especially regarding leaves or vacations - to avoid database duplication. It should also be capable of storing attachments in file format to reduce the risk of loss and damage (Sari & Yulianto, 2017).

Based on direct observations by researchers at Perhentian Marpoyan Village with Mr. Dapit Darmansyah as the office guard, it was found that the current method of recording employee attendance is still manual. Employees use Microsoft Word to print out their attendance sheet and sign directly on it (Sianturi & Wijoyo, 2020).

Previous research indicates that good time management is crucial for managing resources and costs within a company. The solution derived from this system simplifies the process for employees requesting leave and overtime hours. However, this research differs as it designs an information system encompassing attendance records along with approval requests and absences within one unified system (Andriani et al., 2018).

The current practice of manually storing employee attendance information makes it challenging for officers at Perhentian Marpoyan Village to retrieve specific data related to employee attendance records. Therefore, an automated employee attendance information system is needed so that these records can be managed more effectively; facilitating easy access to specific data while preventing unauthorized manipulation (Sofyan et al., 2021).

In this study, a web-based employee attendance information system was developed at Perhentian Marpoyan Village as an evolution from the old manual process into a digital one capable of processing both employee attendances and leave requests more efficiently (Prabudi & Sutisna, 2021).

The existing procedure for tracking staff presence at Perhentian Marpoyan Village Office has proven inefficient due to its reliance on manual processes ranging from data collection through calculation of working hours which often leads errors in storage making retrieval difficult resulting in potential loss(Subiantoro & Sardiarinto ,2018)

Given these issues researchers are interested in developing an improved digital solution (Taufiqurrahman et al.,2019).To address these concerns a web-based intranet-linked timekeeping solution would be beneficial.A website provides accessible informational pages via internet enabling usage anywhere (Puspitosari ,2010).Meanwhile ,the internet represents an organizational computer network utilizing internet technology facilitating exchange of information (Mulyanto cited O'Brien ,2009). It's hoped this application will minimize problems associated with tracking staff presence at Perhentian Marpoyan Village (Rokhmah & Muslihah ,2021).

3. Research Method

In making employee attendance information systems, researchers use *agile* methods in the software development process. According to Aminuddin, et al (2022) in his research, it can be seen that system development carried out using the agile software development method gets results that are in line with expectations after testing the system using *black box* testing. (Aminuddin et al., 2022).

Agile is a form of literacy or iteration, the goal is to respond and overcome any changes flexibly, thereby reducing project time and achieving client satisfaction. (Hikmah et al., 2021). Agile Software Development is a collection of methods used for software development which is carried out in stages. The agile method in its use is able to make decisions in software changes

according to the intended market conditions, the results of software using this agile method will be more flexible and efficient. The most important value of Agile development is that it allows a team to make decisions quickly, has good quality and predictability, and has good potential in handling any changes. (Aldisa & Abdullah, 2022).

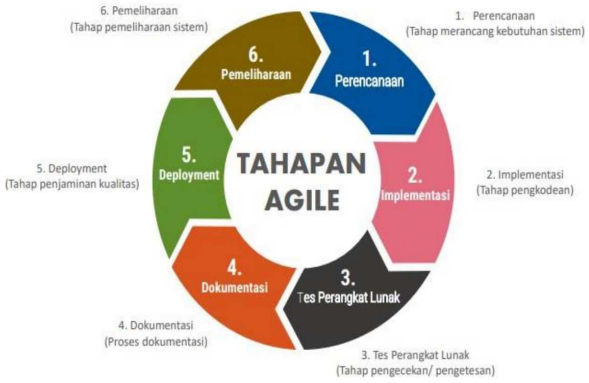


Figure 1. Stages of Agile Method

This Agile method has several stages, namely:

a) Planning
   This planning stage is the stage where the development team and the client create the design together. In this phase, the system designer creates a general plan that serves as a starting point / reference for system development based on the client's previously discussed needs.
b) Implementation
   At this stage, the programmer will implement system development by improving the existing system and coding the system. The system developed is web-based using the PHP programming language.
c) Software Test
   The first step in software testing is to prevent system errors or system failures. This testing process is very important to achieve good software quality. The sooner system vulnerabilities are found and fixed, the better the quality of the software. At this stage, researchers use black box testing to test the validity between input and expected output.
d) Documentation
   This stage aims to make it easier for developers to develop and maintain the system. Documentation-related processes include documentation of program modules and features, backup of files used during development, database design, subroutines, input and output values.
e) Deployment
   Deployment terjadi ketika sistem bebas dari kesalahan dan bug, Pada tahapan ini pengembang membuat sistem/perangkat lunak tersedia bagi pengguna dengan tujuan alikasi bisa digunakan oleh klien.
f) Maintenance
   This stage aims to ensure that there are no more bugs that interfere with the previous system so that the quality of the system built is maintained. Therefore, the system requires regular maintenance.

4. Results and Discussion

Before implementing this system, researchers conducted a PIECES analysis to get more specific problems.

Table 1. Pieces Analysis

	Running System	Proposed System
P	The manual employee attendance information system still uses paper / forms, so it greatly affects performance in the process of filling out absences for employees.	The proposed employee attendance information system is computerized by connecting using a system that can facilitate the process of filling attendance for employees quickly so that it will be integrated.
I	In the flow of information that exists in filling out employee attendance, it is still using paper that must be entered manually into the employee attendance filling system.	The proposed employee attendance system will reduce *human error* because it will be systemized to fill the attendance of employees according to what is inputted to be fast because it is directly generated from the system.
E	The old system incurred a lot of costs for procuring paper and other stationery so that it required a very large budgeted cost and errors often occurred.	The new system will incur considerable costs, because you have to buy a server along with an expensive network. The system has reductions and advantages of the developed system.
C	The current system still lacks data security controls, which will occur in data and information in an institution.	The new system can facilitate control in an attendance system for employees to avoid and detect errors in data and information security systems.
E	The old system still uses controls to make data that is still lacking in filling out attendance on employees.	In the new system, filling in attendance will make data collection more accurate and each is consistent in presenting data / reporting data.
S	In the old system, taking attendance will take a long time and is less efficient to obtain data and produce information that is long enough to obtain data.	The new system will fill in the absence of better employees provided by the system. And make it easier from the system to fill in employee attendance which produces fast information.

Use Case Diagram

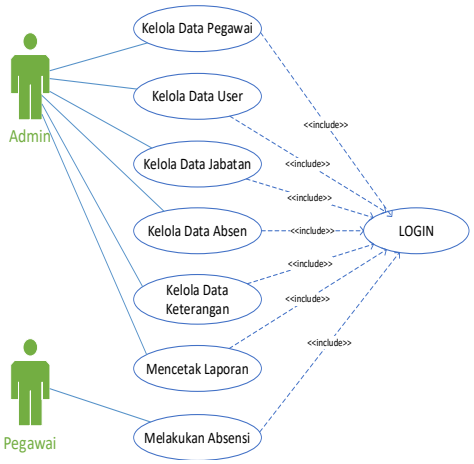


Figure 2. Use Case Diagram

Activity Diagram

Activity diagram is a description of the sequence of activities for a particular process. Based on the existing *use cases*, an *activity* diagram is created for each *use case. The* following is an activity diagram of the Employee Attendance website in Perhentian Marpoyan Village:

1. *Login dagarm activity*

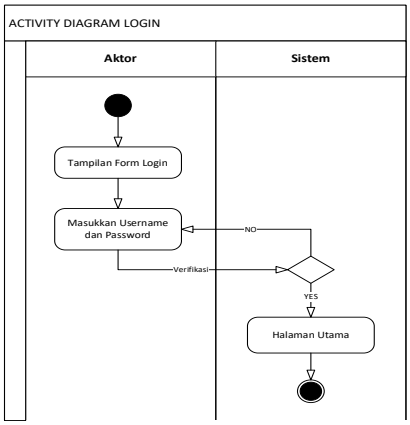


Figure 3. *Login Activity Diagram*

2. *Activity diagram for* managing employee data

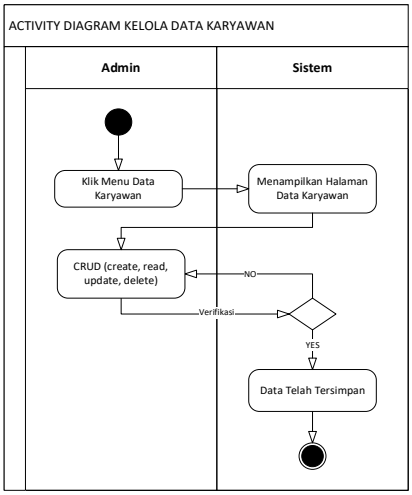


Figure 4. *Activity Diagram of* Manage Employee Data

3. *Activity diagram of* managing *user* data

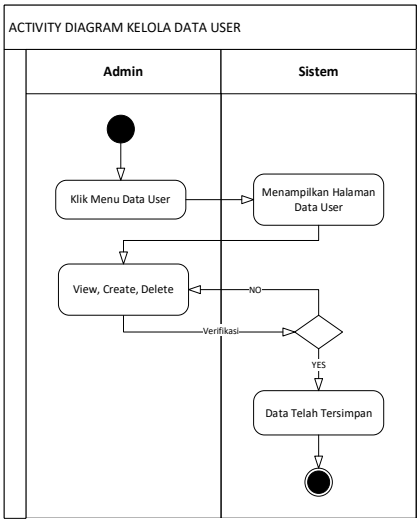


Figure 5. *Activity Diagram* Manage *User* Data

4. *Activity diagram for* managing job title data

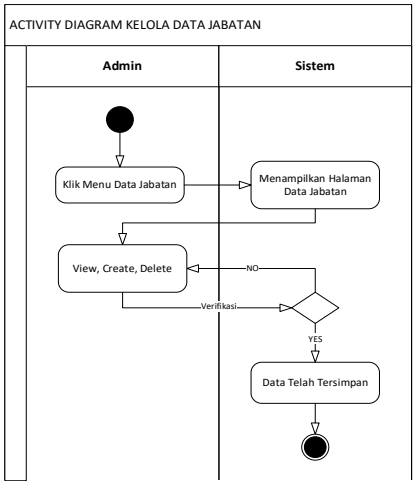


Figure 6. *Activity Diagram of* managing job data

5. *Activity diagram for managing* absence data

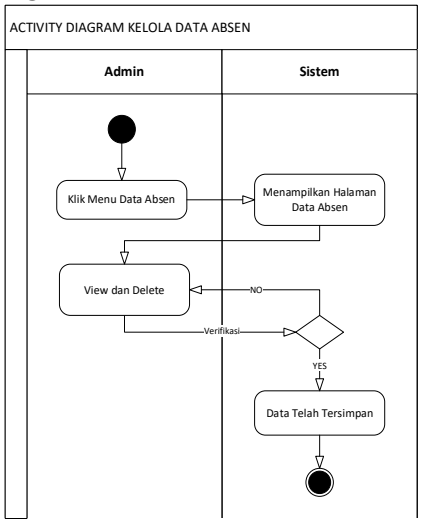


Figure 7. *Activity Diagram* Manage Absence Data

6. *Activity diagram for* managing caption data

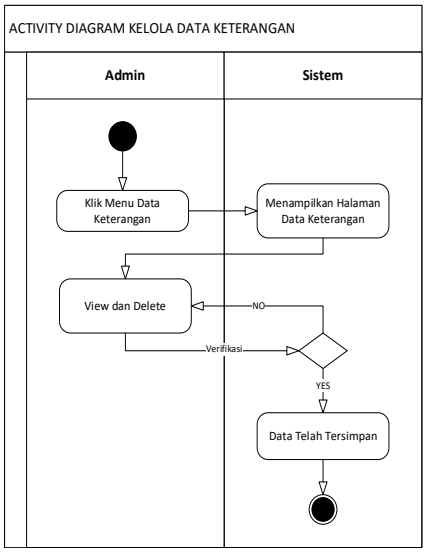


Figure 8. *Activity Diagram* Manage Description Data

7. *Activity diagram of* print report

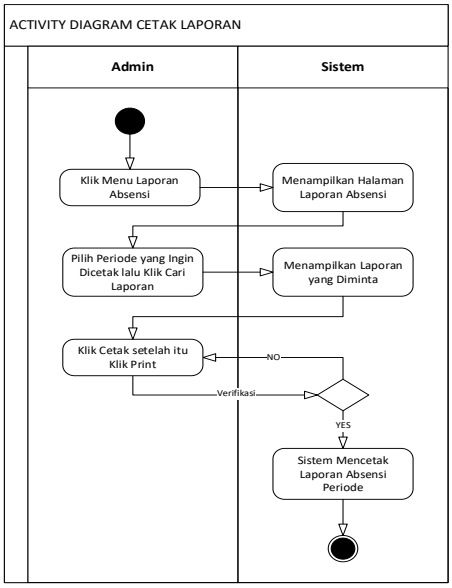


Figure 9. *Activity Diagram* Print Report

8. *Activity diagram of* employee taking attendance

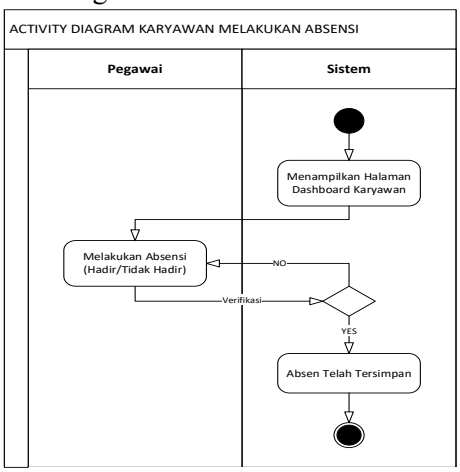


Figure 10. *Activity Diagram of* Employee Taking Attendance

Class Diagram

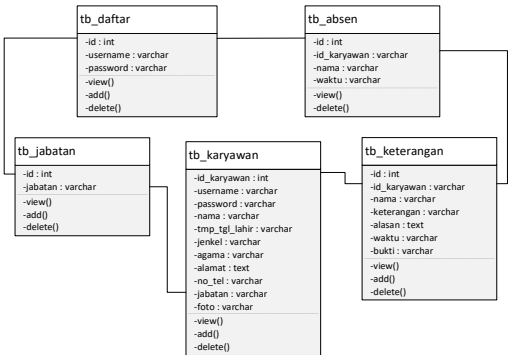
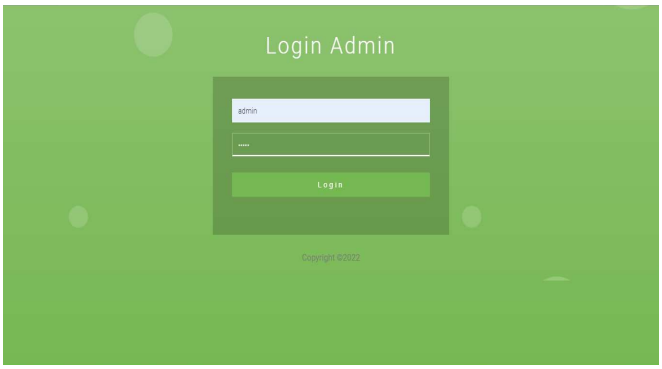


Figure 11. *Class Diagram*

Interface Design

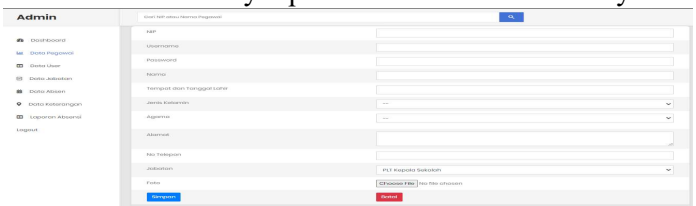
1. Employee Attendance *Home* Page
   Here's a look at the employee attendance *home* page

2. *Login Interface*
   The following is a login view, to access the system the user is required to fill in the *username* and *password first*.

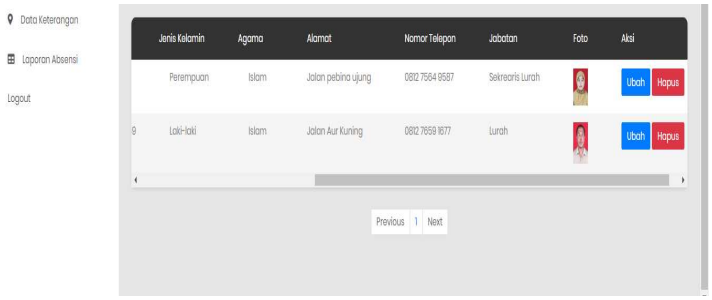


3. Dashboard / *Home Interface*
   The following *dashboard* page displays some of the features available on the system.

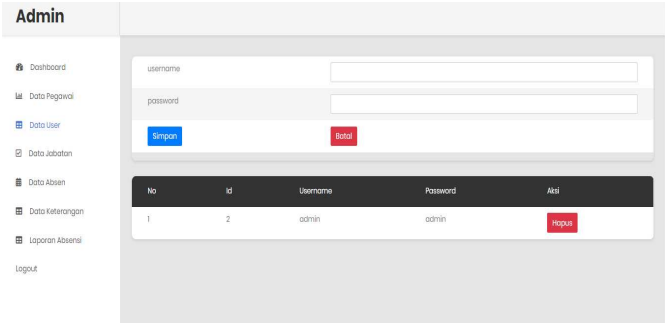
4. Employee Data Input *Interface*
   In the picture below is a picture of the page for inputting employee data. This page functions to add new employee data. Where it contains nip, *username*, *password*, name, place and date of birth, gender, religion, address, telephone number, position, and photo. After completing all existing forms, save so that the newly inputted data is stored in the system.



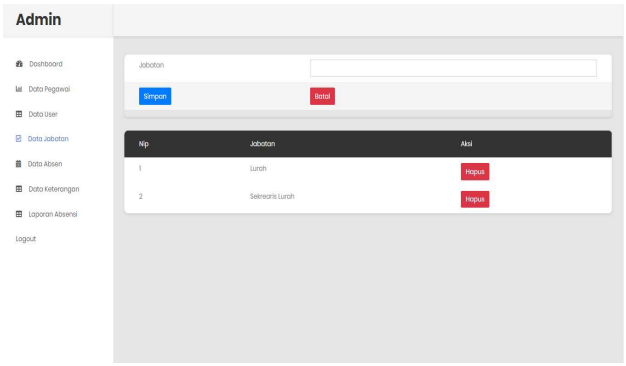
5. Employee Data *Interface*
   On this employee data page there are nip, name, place and date of birth, gender, religion, address, telephone number, position, and photo. This page can also edit and delete data.



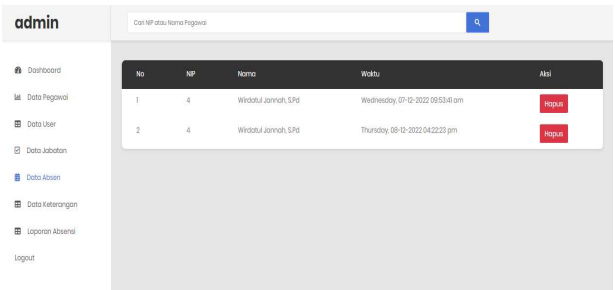
6. *User* Data *Interface*
   On this *user* data page there are no, id, *username, password*, and action. This page can also delete data and input data.



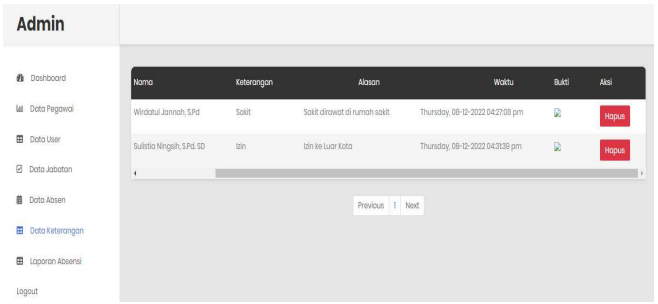
7. Position Data *Interface*
   On this position data page there are no, id, *username, password*, and action. This page can also delete data and input data.



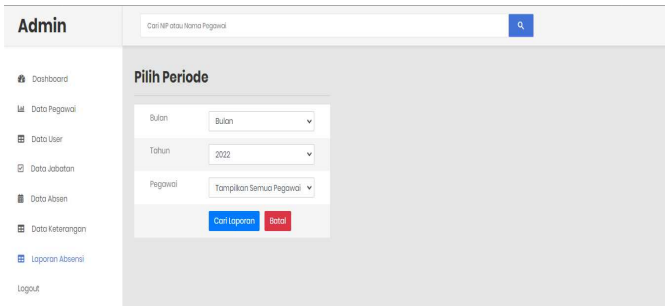
8. Absence Data *Interface*
   On this absence data page there is no, nip, name, time, asksi. This page can also delete data and search features.



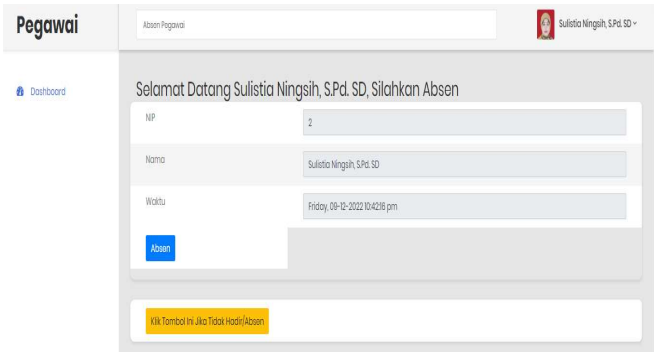
9. *Interface* Data Description
   On this information data page there is no, nip, name, description, reason, time, evidence, action. This page can also delete data.



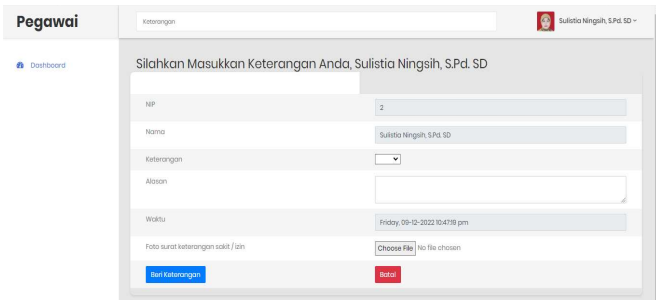
10. Attendance Data *Interface*
On this attendance data page there is a data search and attendance report for all employees every month.



11. Employee *Interface*
On this employee page there are words Welcome *user*, please take attendance. There is an absence and no absence feature.



12. Employee *Interface*
On this absent employee page there are nip, name, description, reason, time, photo of certificate. This page can also feature annotate and cancel.



Testing

In software testing there are various methods that can be used to test, for example the *Black Box Testing* method. *Black Box Testing* is a testing method that focuses on the functionality specifications of the software. This test provides a description of a set of input conditions and tests the functional description of the program. (Nurudin et al., 2019).

Black Box Testing is used to detect the following problems:

a. Incorrect or missing functions.
b. Interface errors.
c. Data structure and database errors.
d. Function error.
e. Declaration and termination errors.

The following tests were carried out using *Black Box Testing* on the Employee Attendance System in Perhentian Marpoyan Village:

Table 2. *Testing* Using *Black Box Testing*

Test Case	Testing Procedure	Expected Output	Results	Conclusion
Open the system	Open the website using a web browser	System view	✓	Accepted
Admin Login Menu	Enter your username and password and click login	Admin page	✓	Accepted
Employee login menu	Enter your username and password and click login	Employee page	✓	Accepted
Employee data menu	Click on employee data	Employee data page	✓	Accepted
User data menu	Click user data	User data menu	✓	Accepted
Position data menu	Click on position data	Position data menu	✓	Accepted
Absence data menu	Click on absence data	Absence data menu	✓	Accepted
Description data menu	Click caption data	Description data menu	✓	Accepted
Attendance report menu	Click on attendance report	Attendance report menu	✓	Accepted
Logout Menu	Click logout	Exit the system	✓	Accepted

5. Conclusions

The design of a web-based employee attendance information system in Perhentian Marpoyan Village enhances effectiveness in data processing and aids employees, particularly in compiling data reports. The Agile Development method utilized is instrumental for future project planning, accelerating system development, and organizing work plans for subsequent periods. Given the constraints encountered during the creation of this employee attendance information system, further enhancements are necessary. This includes direct collaboration with the village to record attendance effectively. A stable internet connection is also essential to properly check and collect employee report data.

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