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WEB-BASED EMPLOYEE LEAVE APPLICATION INFORMATION SYSTEM USING THE WATERFALL METHOD

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ABSTRACT

Information systems are the most important part in running and managing a data source. One of them is a website -based employee leave application information system . The website -based employee leave application information system at the Medan City Central Statistics Agency still uses the manual method written in an employee leave application form. The system development method in this study, the author uses the waterfall method where the collection techniques are in the form of observation and interviews. In the implementation and design of the program the author uses the PHP programming language with the database used is My SQL to store data. The results of this study can be concluded that with the creation of a website -based employee leave application information system, it is expected to simplify and speed up the employee leave application process so that it can reduce errors in processing employee leave applications.

1. Introduction

The development of technology that is currently increasingly rapidly has a good impact, especially for a company. With the development of technology can facilitate human work. One of the technological developments is the availability of fast, accurate and timely employee leave applications. Delays in data processing can cause delays in the development of a company. The longer it is felt that the submission of employee leave using the manual method is increasingly ineffective and efficient. Therefore, it is necessary to apply for a more sophisticated employee leave using the website. This is necessary to realize the acquisition of information that is fast, accurate and timely. At this time, the procedure applied to the application for employee leave at the Central Statistics Agency of Medan City is still manual based. The application for employee leave only uses a written form which is then archived. Calculation of remaining leave and searching for leave application data only uses manual calculations.

One way to fulfill employee rights is by granting leave to every employee. In general, an employee is someone who is actively working in an organization or company to fulfill their needs[1]. There are several types of leave that can be taken by employees, and the requirements that are met include Annual Leave, Grand Leave, Sick Leave, Maternity Leave, Leave for Important Reasons[2]. Leave or permission is the right for every employee or employee from the government or the private sector. A worker is entitled to an annual leave of at least 12 working days[3].

According to previous research conducted by Khumaidi et al concluded that the results of the analysis and design of the leave application were generated by modeling using an object-oriented approach with UML and presentation using use case diagrams , activity diagrams, sequence diagrams and class diagrams. The results of the design in the form of database and user interface designs are then evaluated by assessing user interface , content and usability categories the result is that the application for submitting leave is very much

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needed by the user, the content is in accordance with the needs and the form is designed according to the user's request[4]. The second previous research study by Paryanti and Atik Budi Sumarsid concluded that the online leave application made could simplify the process of submitting and approving leave. With the online leave application, the process of submitting a leave proposal can be done anywhere, anytime without having to meet face to face. With the online system, the accumulation of leave is done automatically by the system so that the accumulated leave balance can be presented correctly. In the Website-Based Online Leave Application for Employees of the Directorate General of Badilmiltun, the Supreme Court of the Republic of Indonesia, there are access restrictions between employees as users, admins, personnel department, direct supervisor, secretary of the Directorate General of Badilmiltun and Director of the Directorate General of Badilmiltun[5]. And in the previous third study by Seprina and Yulianingsih concluded that this research resulted in a leave application system for employees that can be done online with a mobile-based basis so that it can be easier for employees to apply for leave without the need to come directly to the HRD department. With this mobile-based employee leave application system, employees can find out how much remaining leave has been taken without the need to directly ask HRD[6].

Based on the problems that occur, the solution is to create an information system for filing employee leave with the PHP programming language and mysql database and the method used is *waterfall.* The planned application in the form of a *website* is planned so that the application is dynamic, practical, and can be accessed anywhere, anytime, and by all employees to facilitate the process of processing and sharing the required data[7].

2. Method

The method used in the development of this software uses the waterfall model. A classical model that is structured in software development, which is divided into five stages, namely[8]:

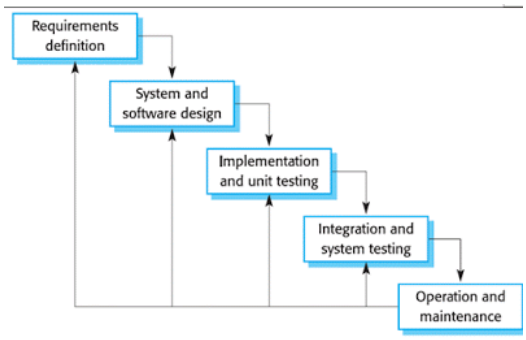

Figure 1. Waterfall Method

a. Requirements Definition
In this step is an analysis of the system requirements. Collecting data at this stage can conduct a research, interview or study of literature. A system analysis person will dig up as much information as possible from the user so that a computer system will be created that can perform the tasks desired by the user . This stage will produce a user requirement document or it can be said as data related to the wishes of the user in making the system. This document will be the reference for the analysis system to translate into language[9].
b. System and Software Design
Software design is a multi-step process that focuses on the design of a software program including data structures, software architecture, interface representations, and coding procedures. This stage translates software requirements from the requirements analysis stage to a design representation so that it can be implemented into a program at a later stage. The software design produced at this stage also needs to be documented[10].
c. Implementation and Unit Testing

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To be understood by machines, in this case a computer, the design must be transformed into a form that can be understood by machines, namely into a programming language through the coding process . This stage is the implementation of the design stage which will technically be done by the programmer[11].

d. Integration and System Testing
At this stage, the system is verified and tested whether the system fully or partially meets the system requirements, testing can be categorized into unit testing (performed on certain modules of code), system testing (to see how the system reacts when all modules are integrated) and acceptance testing. (done with or on the customer's behalf to see if all customer needs are satisfied)[12].

e. Operation and Maintenance
Due to a change when it was sent to the user. Changes can occur due to errors that appear and go undetected during testing or the software must adapt to a new environment. The support or maintenance phase can repeat the development process starting from specification analysis for changes to existing software, but not to create new software[13].

3. Result and Discussion

3.1 Use Case Diagrams

Use case is a series or description of a group that is interrelated and forms a system that is regularly carried out or monitored[14]. Use Case is used to determine the relationship between the system and actors. There are 3 actors involved, namely Admin/HRD, Employees and Leaders as shown in Figure 2.

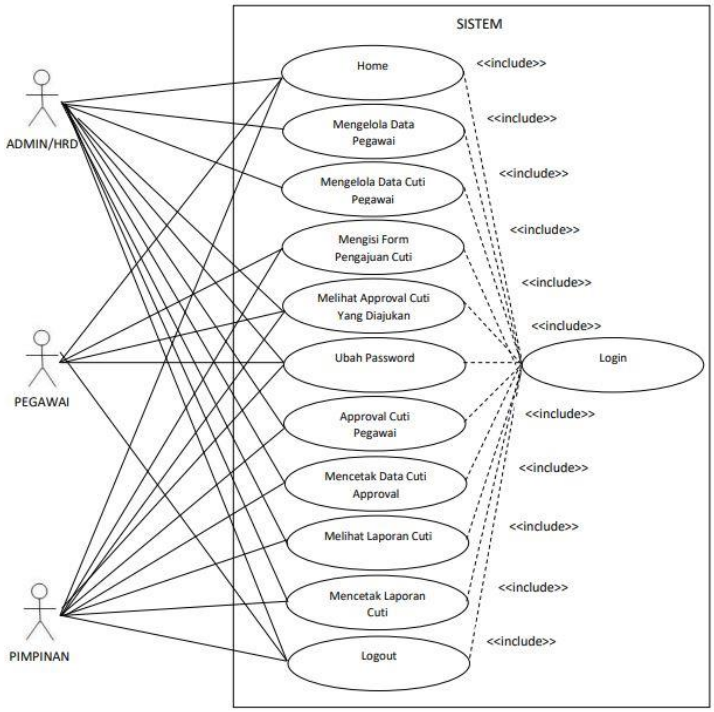

Figure 2. Use Case Diagram

3.2 Activity Diagrams

Activity diagrams model the workflow of business processes and the sequence of activities in a process. This diagram is very similar to a flowchart because it models the workflow from one activity to another or from activity to state[15]. The steps of the system process work on the activity diagram as shown in Figure 3.

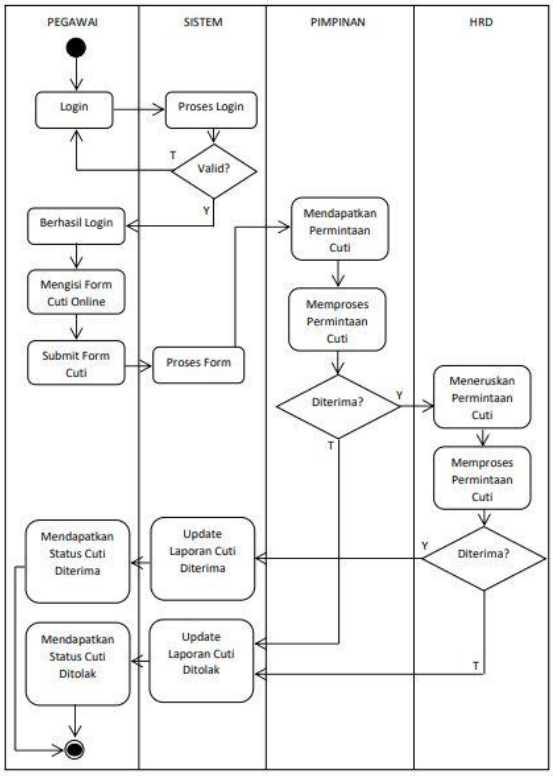

Figure 3. Activity Diagram

3.3 Entity Relationship Diagram (ERD)

This ERD is a conceptual model that can describe the relationship between the files used to model the data structure and the relationship between the data[16]. The ERD in Figure 4 describes the relationship between databases that are related to each other.

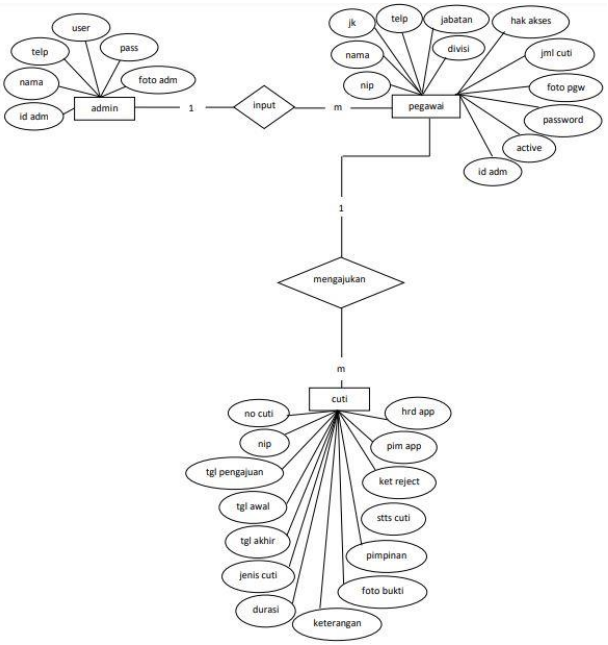

Figure 4. ERD

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3.4 Data Flow Diagrams (DFD)

DFD is a data logic model or process created to describe where the data comes from, where the data comes out of the system, where the data is stored, what process the data is generated and the interaction between the stored data and the processes imposed on the data[17].

3.4.1 DFD Level 0

DFD Level 0 can be seen in Figure 5.

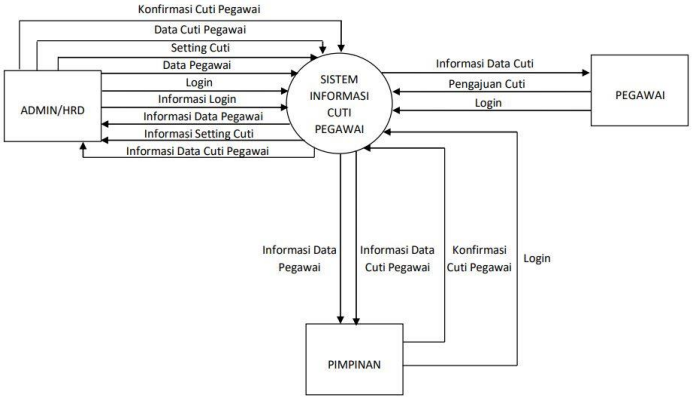

Figure 5. DFD Level 0

3.4.2 DFD Level 1

DFD Level 1 can be seen in Figure 6.

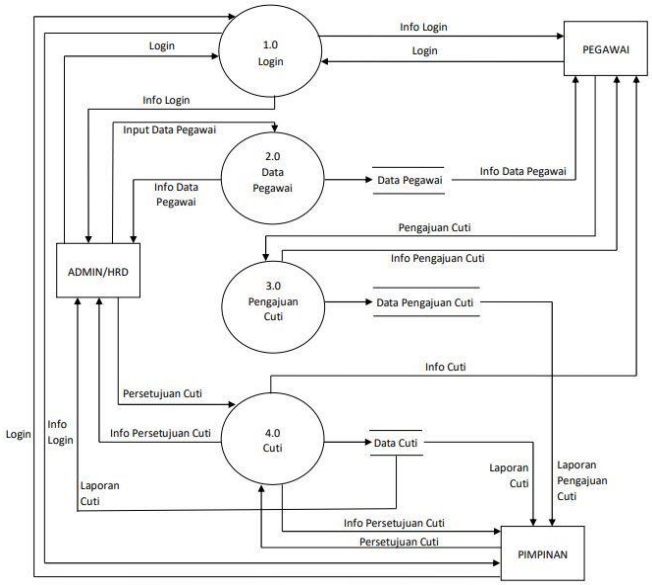

Figure 6. DFD Level 1

3.5 Program Implementation

The implementation of this program is a program design as a result of research.

3.5.1 Login Page

Home page to enter the login page . The user must enter the username and password that has been given by the admin/HRD on the login page .

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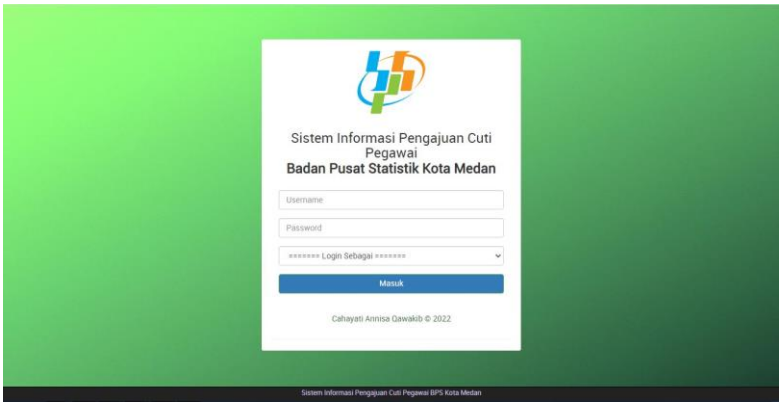

Figure 7. Login page

3.5.2 Admin/HRD Dashboard Page

The admin/HRD dashboard page contains a notification of the number of employees and the number of employee leave data waiting for approval .

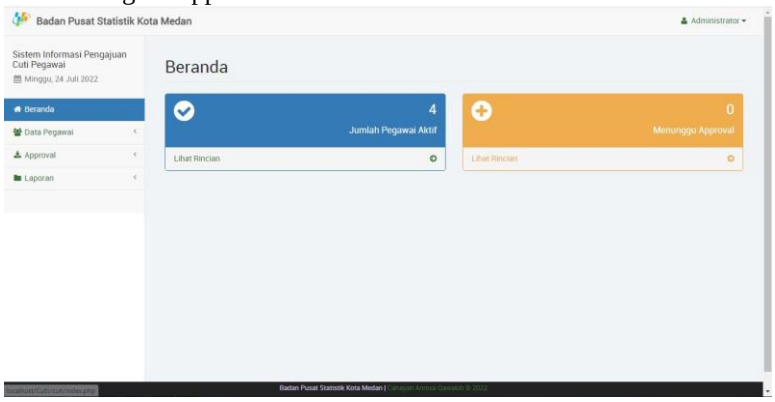

Figure 8. Admin/HRD Dashboard Pages

3.5.3 Employee Data Page

On this employee data page, the admin can perform data processing in the form of editing, deleting, adding employees and viewing employee data details.

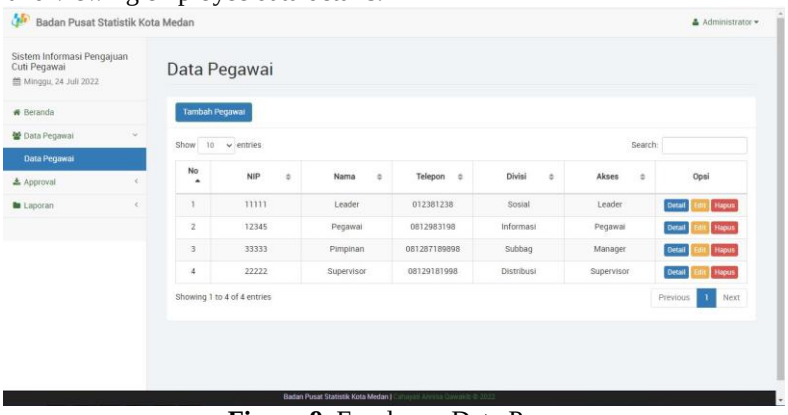

Figure 9. Employee Data Page

3.5.4 All Leave Data Page

This page contains data on employee leave that has been approved , rejected and employees who are waiting for approval from the leadership or admin/HRD.

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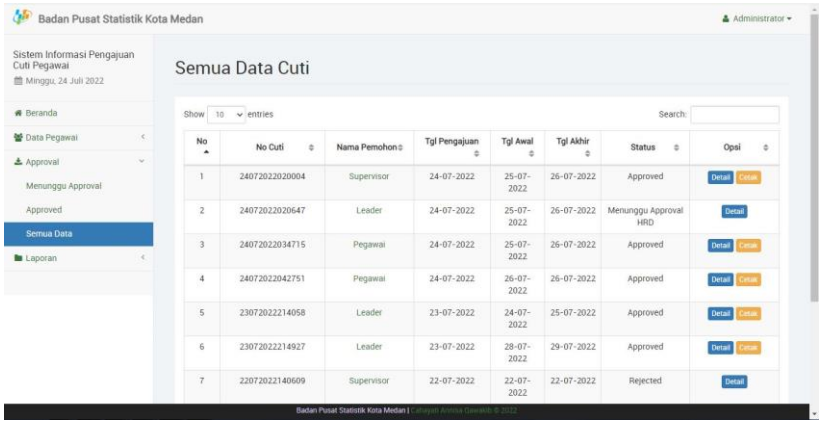

Figure 10. All Leave Data Page

3.5.5 Employee Dashboard Page

On this employee dashboard page, it contains a notification of the number of leave data that has been approved , waiting for approval and rejected .

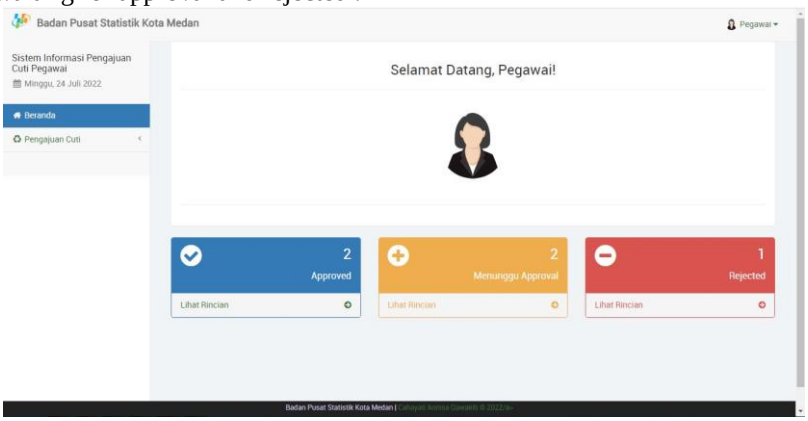

Figure 11. Employee Dashboard Page

3.5.6 Employee Leave Application Form page

On this employee leave form page, employees can fill in data for submitting leave according to the submission form in Figure 12.

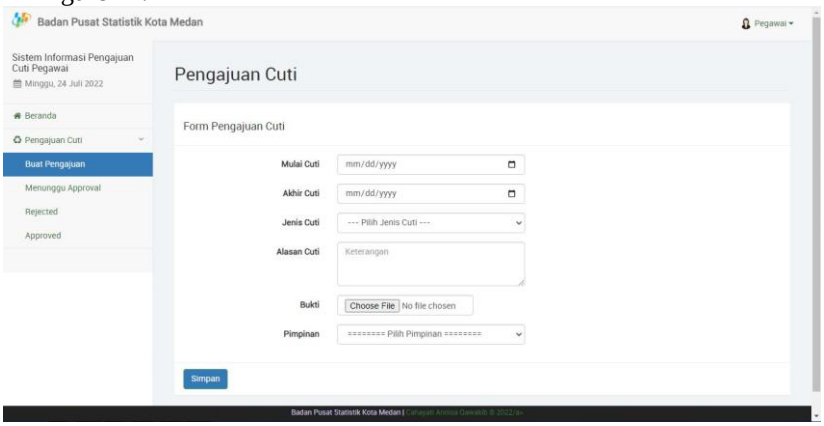

Figure 12. Employee Leave Application Form page

3.5.7 Approved Leave Data Page

On the approved leave data page, employees will see the approved leave data that has been

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submitted and approved by the leadership and admin/HRD. Employees can print the approved leave data .

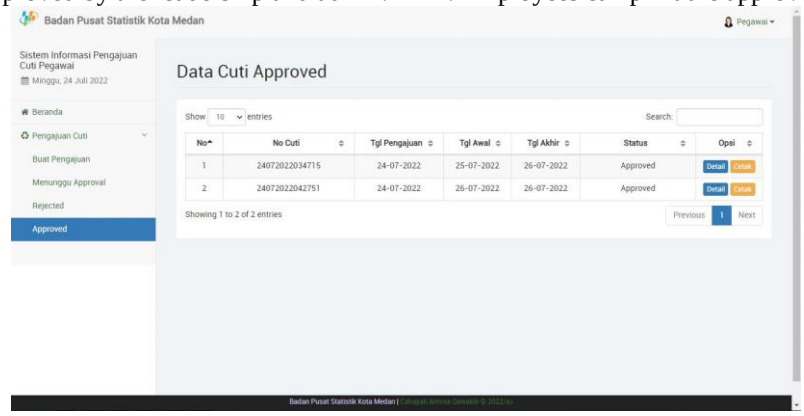

Figure 13. Approved Leave Data Page

3.5.8 Leader Dashboard Page

The leadership dashboard page contains notification of the number of employee leave data that is waiting for approval and all submitted leave data. Notification of the number of leave submitted by the leadership that has been approved by admin/HRD, waiting for approval and rejected .

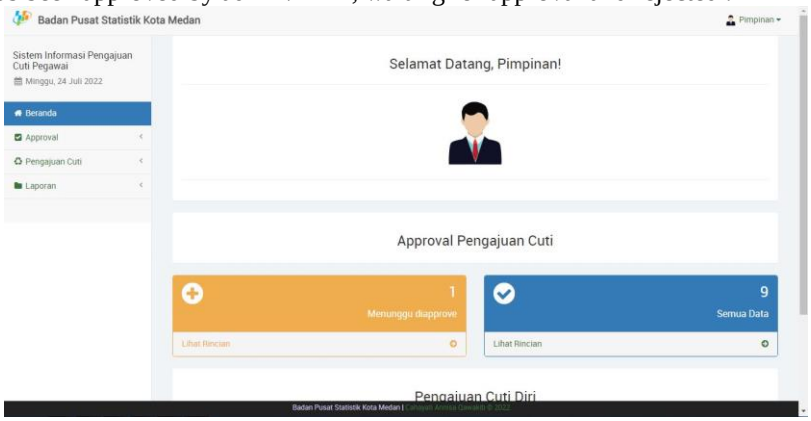

Figure 14. Leader Dashboard Page

3.5.9 Leave Approval Page

On this leave approval page, the leadership and admin/HRD will approve or reject the employee leave that has been submitted.

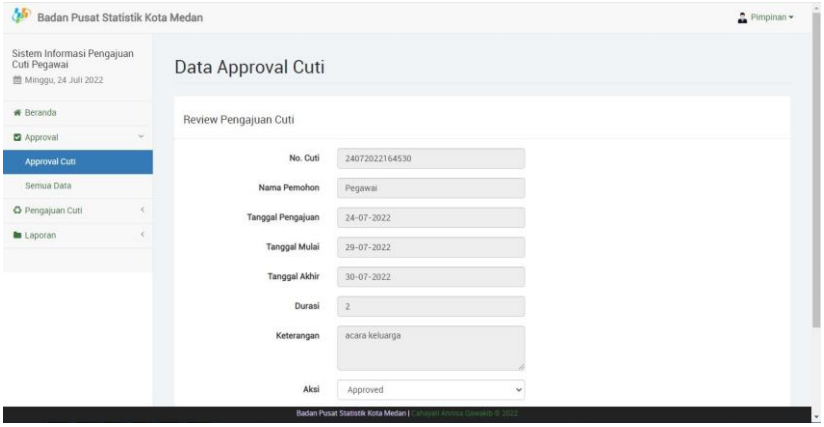

Figure 15. Leave Approval Page

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3.5.10 Leave Report Page

This leave report page contains data on employee leave that has been approved or is waiting for approval from the admin/HRD and leadership. This leave report page can only be seen by admin/HRD and leaders.

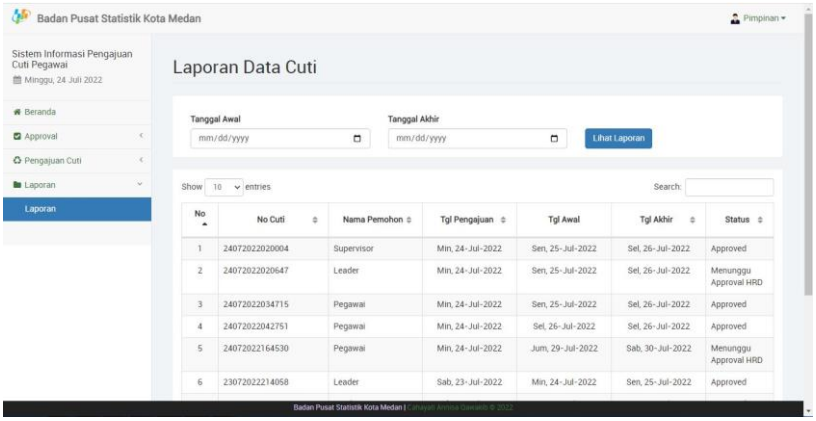

Figure 16. Leave Report Page

3.5.11 Print Leave Report Page

In Figure 17, admin/HRD and leaders can print a leave data report that has been submitted by employees.

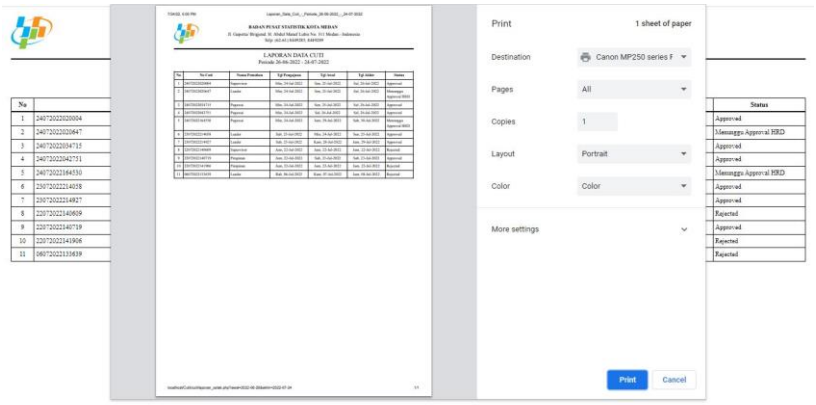

Figure 17. Leave Report Page

4. Conclusion

Based on the results of the research that has been done, the conclusion is that by making an information system for filing employee leave, it can speed up and make it easier for employees to take leave and data storage becomes safer and neater, making it easier for HRD to manage leave data. When the leader asks for a leave report, there is no need to look for the file because there is already an information system for submitting employee leave and it is more effective than previous leave taking which still uses the manual method. The process of applying for leave can be done anywhere and anytime without having to meet face-to-face with HRD and leaders online

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