

Original Article

Human Capital Management System Using Fishbone Analysis

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Abstract - One of the important assets that cannot be separated from an organization, institution, or company is human resources. Human resources are also the key that determines the development of a company. Its human resources influence a company's development because the human resources employed in the company are in the form of people as movers, thinkers, and planners. Some companies have problems managing employee data collection, attendance, and payroll. In recording attendance, the data is often inaccurate because additional data such as permits, leave, and assignments outside the office are often lost, so they are not recorded properly. Then there was an error in calculating salaries, which resulted in delays in recording and giving salaries. In addition, data collection on employees who are still irregular in storage so that they experience difficulties when requiring employee data. For handling these problems, solutions are made in the form of a Human Capital Management system that will assist companies in managing attendance data, employee data, and payroll processing. In addition, this study uses Fishbone analysis to help understand the problems that occur and the system's needs. This system is expected to increase the effectiveness of checking and calculating attendance, the accuracy of sending employee salaries, the accuracy of employee data, minimizing the risk of data loss, and improving employee data performance. For handling these problems, solutions are made in the form of a Human Capital Management system that will assist companies in managing attendance data, employee data, and payroll processing. In addition, this study uses Fishbone analysis to help understand the problems that occur and the system's needs. This system is expected to increase the effectiveness of checking and calculating attendance, the accuracy of sending employee salaries, the accuracy of employee data, minimizing the risk of data loss, and improving employee data performance. For handling these problems, solutions are made in the form of a Human Capital Management system that will assist companies in managing attendance data, employee data, and payroll processing. In addition, this study uses Fishbone analysis to help understand the problems that occur and the system's needs. This system is expected to increase the effectiveness of checking and calculating attendance, the accuracy of sending employee salaries, the accuracy of employee data, minimizing the

risk of data loss, and improving employee data performance.

Keywords - Human Capital Management, Employees, Fishbone.

I. INTRODUCTION

Human Resources (HR) is an important capital in a company. Human resource management is a form of dealing with various problems in the workforce, such as labourers, employees, managers, and others who can support activities to achieve predetermined goals. Human resources must also be appropriately managed. It can even be said that organizational management is a human management process. Where all organizations, regardless of their type, size, shape, function, or purpose, must operate with and through people. It can be said that humans are the most dynamic and complex elements when compared to other elements. Often the efficiency of implementation in an organization depends on the management and utilization of people in it. The management of human resources within the organization is known as human capital management. Human capital management reflects human capital involving the dimensions of experience, judgment, and intelligence [1]. In addition, human capital management, also known as human capital, is a very important element in an organization where there is human capital that has the ability to be mobilized as a whole to produce extraordinary performance[2]. Human capital elements include individual capability, individual motivation, organizational climate, workgroup effectiveness, and leadership [3].

Human resource management in the company is only managing employee data collection, employee attendance, and payroll. The system that runs in the company's human resource management process is from the employee attendance report process. The employee takes attendance at the attendance machine. The HRD takes the machine's attendance data and recapitulates the attendance data into a report in excel form every month. HRD checks and enters information about employee attendance status. HRD must double-check between attendance and the calculation of the number of overtime days for calculating employee salaries. This was also stated in the research conducted by Julian Chandra Wibawa and Fany Julianto [4]. This was also



stated by Md. Uzzal Hossain and Ishita Roy. The concept of Human capital management is related to the added value that people provide to the organization. It confirms that competitive advantage is achieved by strategic investment in such capital through employee engagement, talent management, and learning and development programs [5].

In research conducted by Nia Kusuma Waradhani and Muhammad Thariq, Abdul Aziz stated that human resource management was not supported by information system technology. In the process of filing leave and claims that are still manual, the management is not optimal. Often some applications are missed because of the many submissions that have been submitted. Another obstacle faced is the problem of attendance, making it difficult for the human resources department to record the attendance data of employees who work remotely and match it with the data of employees who work in the office [6].

Other research conducted by Dian Permata Sari, Ochi Marshella Febriani, and Arie Setya Putra also stated that the current system had not used special computerized and database-based applications carried out in a conventional manner, recorded and stored by certain officers [7]. Other research conducted by Supriyanta, Aan Triadi, and Ari Kustanto has problems with the attendance system, fuel note claims, manual applications for permits or leave, and many employees [8]. Another research conducted by Annasarah M. Chinyuka had a problem with a system that had not been computerized so that the information management process in LGA Tanzania [9]. Anna N. Ndaro also stated this. The current system is less effective and efficient in managing employee data at the Ushetu District Council because there is no computerized system [10]. Another research conducted by Lilian Mrosso has a problem with awarding awards for Tanzanian government employees, which is still done conventionally [11].

Then the problem that occurs is a delay in payroll up to one week. Research conducted by Zarnelly and Istanti Dwi Fajarrini also conveyed frequent errors in calculating salaries because data processing is still done conventionally, causing slow processing of salaries and reports required by the company [12]. The same thing was conveyed in Ombeni Msuya and Paul Loisulie's research. The previous payroll system in Tanzania had shortcomings in the recording system and had difficulty integrating the Ministry of Finance civil servants' records. This has resulted in some people (shadow workers) continuing to collect salaries after employment termination, while new hires are also common [13].

Another problem that occurs in the company is in the process of updating employee data. This is done by the employee asking for the form first, then given to the HRD, and then updated by the HRD. This method is inefficient because it takes a long time, and negligence in storing forms can damage or the form is lost. Loss of employee data occurs due to the mixing of documents between employees because data management is still done manually

[14]. The same thing was also conveyed by Adi Wahyu Pribadi, Sri Rezeki Candra Nursari, and Ira Fransisca, in the process of managing employee data such as attendance, shift exchanges or employee leave calculations, errors often occur, forgetting or not being recorded, due to document loss, so they are not counted properly [15].

Based on the problems that have been described, the main problems can be formulated how to make an employee attendance information system that is integrated with the calculation of employee salaries, how to make an employee salary management process system, how to make a system for employees in changing personal data, and how to create an information system for storage and management processes. Employee personal data is stored in a database.

The objectives to be achieved in this study are to increase the effectiveness of checking and calculating attendance, increase accuracy in sending employee salaries, increase the accuracy of employee data, minimize the risk of data loss and improve employee data performance. With the information system, it is hoped that it can facilitate recruiting employee data, attendance, overtime [16].

II. RESEARCH METHODS

In this study, data collection was carried out by field training (field research). The data was collected using observation techniques in the employee data collection process, the employee attendance data collection process, and the employee payroll process to the HRD department. Then conducted interviews with company managers, several HRD staff, and employees and obtained data in the form of employee personal data forms, attendance reports taken from fingerprints, and examples of salary slips made by the company. The data collected were analyzed using qualitative methods. The results of this study are presented in a report using descriptive methods. The research stages can be seen in the image below.

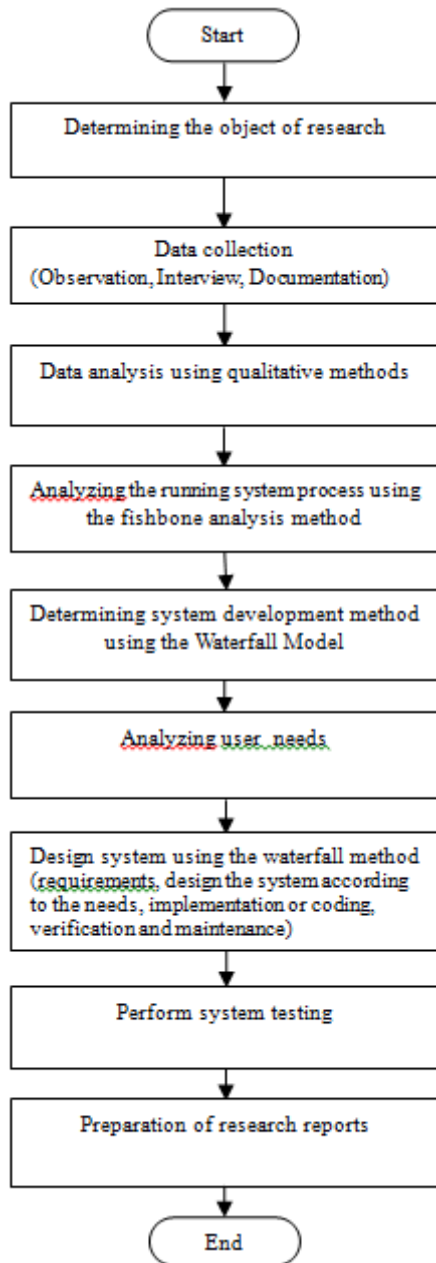


Fig. 1 Research flow

The explanation of the flow chart in Fig. 1 above is as follows:

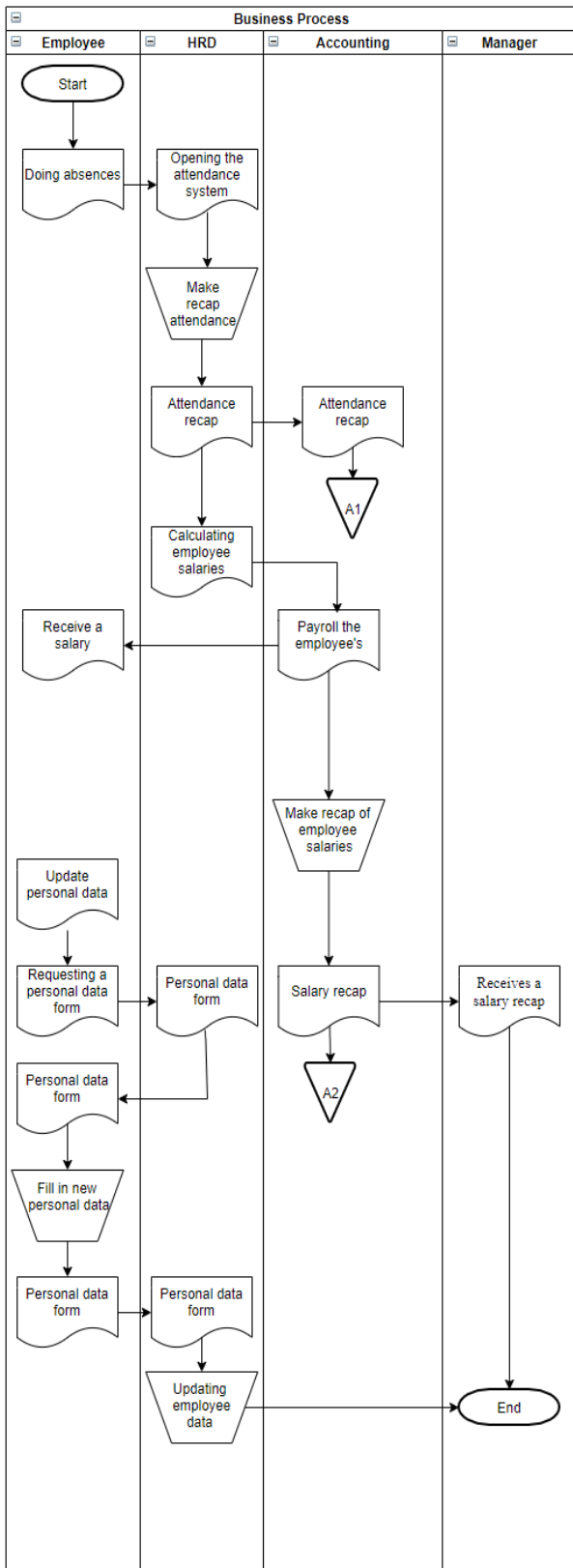
- Determining the object of research is something of concern in a study. The object of this research is the target in research to get answers or solutions to problems.
- Data collection is carried out to obtain information related to the research object to support the research process. In this study, I am using interview techniques and literature studies.
- Data analysis using qualitative methods, namely data obtained from data collection, is analyzed so that the data has meaning.
- Analyzing the running system process is done to identify problems that occur in the running system. This study uses the Fishbone analysis method.

- After knowing the problems faced in the system, a development method is needed to produce solutions to the problems that occur. This study uses the Waterfall system development method.
- At this stage, the system needs to be collected by hearing complaints from users so that the system fits the needs.
- At this stage, the design is carried out using the waterfall method, starting from the requirements, then designing the system according to the needs, implementation or coding, verification, and maintenance.
- At this stage, the system is tested by the user. Then do an evaluation of the deficiencies of user needs.
- Preparation of research reports that serve as documentation.

III. RESULTS AND DISCUSSION

A. Current System Business Process

Based on data collection, it can help in analyzing existing problems and determining the best strategy for developing the system. The running system business process can be seen in the following figure.



A1 = Attendance Recap Data Archive
 A2 = Salary Report Archives

Fig. 2 Current Business Process

The explanation of the business process runs from Fig. 2 above:

- Employees perform daily absences on the fingerprint machine that has been provided, and then the

attendance data is recorded by the machine into the existing system.

- Every month HRD takes the attendance data from the machine and recapitulates the attendance data into excel reports. In the attendance report, HRD checks and includes information on employee absence such as leave, sickness, permission. In this process, there is a lack of error in inputting data because the unreadable writing forms are piled up so that they are slipped or lost.
- Employees can make data changes when they move their residence, after marriage or after someone dies and notify the HRD of the change in status by requesting a personal data form from HRD.
- After receiving the personal data form, employees fill in new personal data and attach files or proof of change. They are then given to HRD.
- HRD receives a completed personal data form and checks the evidence submitted by the employee. This process takes a long time, and errors can occur in inputting and updating employee data due to unreadable writing and forms or employee files piled up so that they are slipped or lost.
- The attendance recap is used by HRD to calculate employee salaries. HRD also includes employee overtime based on the approved form and employee absence information and checks employee loans. In this process, errors often occur in inputting data due to unreadable writing and overlapping forms lost or tucked away and take a long time.
- After calculating, the HRD makes a recap of employee salaries containing a list of employee names, nominal employee salaries, allowances, etc., given to the leader for approval after the report is approved to accounting. The form of salary recap is to excel.
- Accounting receives a salary recap. Then the employee's payroll is carried out by transfer.
- Employees receive a salary.
- Accounting also makes financial reports that must be given to the manager. This financial report is in the form of recording cash out reports for employee salaries. The form of this report is in excel.

B. Fishbone Analysis

The system analysis method used is a fishbone diagram. In this case, analyzing the problem aims to determine the causes and effects that occur and decide which system requirements can help solve problems in the current human capital management system. Fishbone analysis can be seen in the following figure.

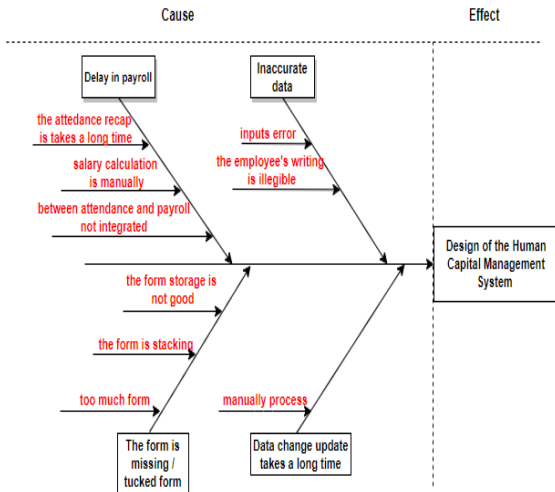


Fig. 3 Fishbone Analysis

Fig. 3 above is a fishbone analysis. The results of the analysis carried out found several problems as follows:

- There is a delay in payroll for up to 1 week. This is because the attendance recap is caused by manual calculations that often miscalculate and take a long time to calculate. In addition, absenteeism and payroll are not integrated, resulting in HRD having to double-check, taking a long time to make salary delays. The solution is to make an integration between attendance and salary so that HRDs don't need to double-check the attendance recap form and create a salary form that can automatically calculate the salary that employees get.
- Inaccurate data when updating employee personal data. This is because when inputting employee data, an error occurs. After all, the employee's writing is illegible. The solution is to provide a function to change or update employee personal data.
- The missing or tucked form in question is like an employee's personal data form in the form of paper that is easily lost or tucked away. This is because the form of storage is not good, or the origin is saved, causing the form to be easily lost or damaged. In addition, forms that are too piled up and too much cause storage space to become full. The solution is to create a form on the system that can change employee personal data and store it in the database.
- Data change update takes a long time when updating employee data takes a very long time. This is because employees have to ask for the form to fill in new data to the HRD and submit it back to the HRD, then the HRD must input the data so that the process of changing this new data takes quite a long time. The solution is to give employees access to view and correct personal data if there is a change in status. So that employees do not have to wait for HRD to update changes in personal data.

C. Use Case Diagram

Use Case Diagrams describe system user interactions with the system by performing functions that the system

can accept. The form of user interaction with the proposed system can be seen in the image below:

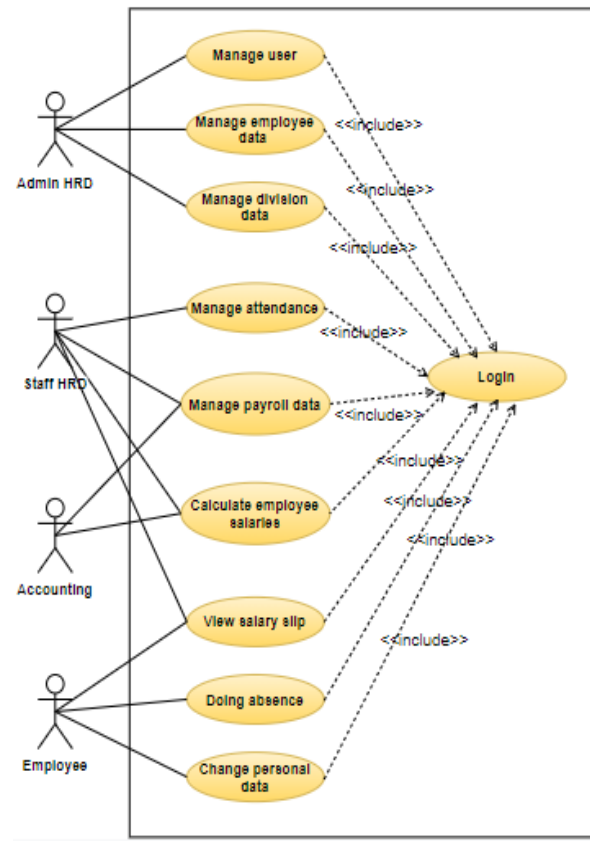


Fig. 4 Use case diagram proposed

Fig. 4 above shows 4 actors, namely admin HRD, HRD Staff, Accounting, and Employees, who have different access rights.

- Admin HRD is an actor who can log into the system, manage user data, manage employee data, manage division data.
- HRD Staff is an actor who can log into the system, manage payroll data, calculate employee salaries, manage attendance, view salary slips.
- Accounting is an actor who can log into the system, manage payroll data, perform salary calculations.
- Employees can log into the system, view salary slips, take absence, change personal data.

The proposed system business process design is about designing a system that will be proposed to solve system problems that are running at this time. The design of the Human Capital Management system is expected to help the company's business processes so that they are more effective and efficient. The rich diagram to describe the human capital management system business process can be seen in Figure 5 below:

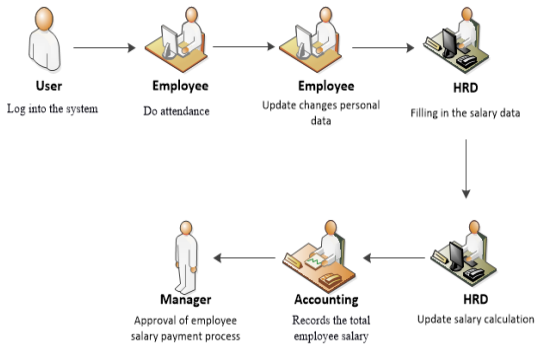


Fig. 5 Human capital management system business process

Fig. 5 above shows the business process of the human capital management system. All users must log into the system. Employees do attendance for incoming attendance and return attendance, and HRD can see the attendance data that employees have successfully done in the system. Suppose some employees want to make changes to their data. In that case, the employee can select the edit profile menu, and the system will display the edit profile page, after which the employee can make the desired data changes. The HRD can see changes in the employee's data that the employee has successfully changed. When calculating employee salaries, the HRD manages the salary first by filling in the salary data consisting of basic salary, allowances, overtime by selecting the salary data menu in the system, and accounting can see the salary data that has been inputted by the HRD.

D. Class Diagram

Class is a description of a group of objects with the same properties, behaviour (operations), and relations. Class diagrams can provide a comprehensive view of a system. This can be seen from the classes that are related to one another. The following is the proposed Class Diagram in the following image:

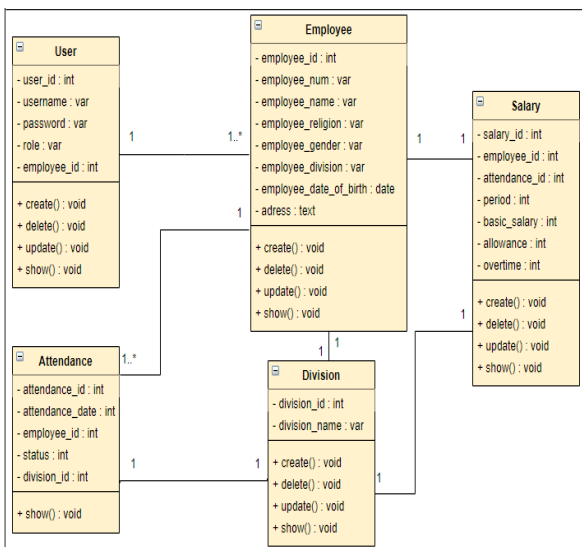


Fig. 6 Class diagram proposed

Fig. 6 above illustrates the relationship between tables, where the user table has a relationship with the employee

table. The employee table has a relationship with the attendance table, division table, and salary table.

- The user table serves to store user data information that can log into the system. In this table, each user has different access rights.
- The Employee table functions to store employee personal data consisting of NIK, name, religion, gender, date of birth, address, and division.
- Attendance table functions to store attendance data performed by employees on the system. Attendance data consists of the time of entry and time of return.
- Division table functions to store division data consisting of division names.
- The Salary Table functions to store employee salary data consisting of basic salary, allowances, overtime, which are integrated with employee attendance data stored in the attendance table.

E. Interface Design

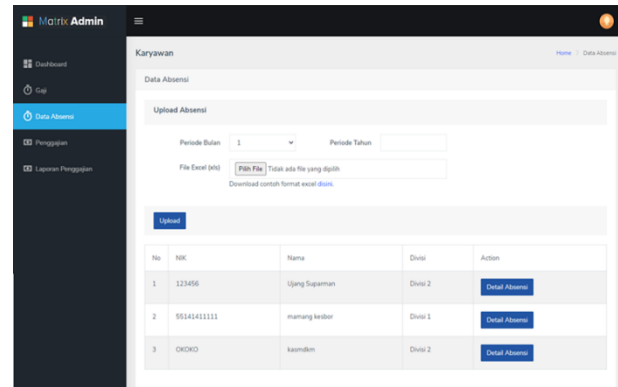


Fig. 7 Attendance data management process

Fig.7 above shows the attendance data collection process. This page functions to manage employee attendance data from the fingerprint machine by HRD staff. This page can only be accessed by HRD staff. On this page, HRD staff can manage employee attendance data such as uploading attendance data from the fingerprint machine by filling in the Month and Year Period, then clicking the Select File button from the fingerprint machine that has been imported into excel, then clicking the Upload button. The system will display the page Salary Calculation on the Payroll menu. This process must be carried out by HRD staff prior to the process of managing employee salary calculations.

On this page, the HRD staff can see the details of each employee's attendance by clicking the Attendance Details button for the selected employee. The system will then display [Name, Nik, date, time of entry, time out, status, and photo]. On this page, the status data can be managed by HRD whether the employee's attendance is valid or not, which will be used to calculate employee salaries.

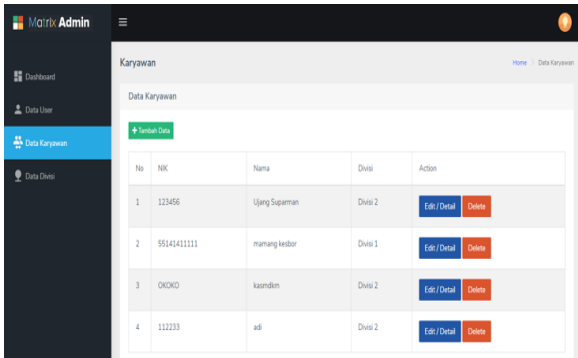


Fig. 8 Employee data management process

Fig.8 above shows the employee data management process. This page functions to manage employee data by the HRD admin. Admins can only access this page. On this page, the admin can manage employee data, such as adding employee data by clicking the Add Data button, and the system will display a data add form. On this page, the admin can complete employee personal data such as NIK, name, religion, gender, date of birth, address, division, username, and password. After all personal data is filled in, the admin can click the save button to save employee data. The admin can also change or view detailed employee data by clicking the Edit/details button and readjusting the employee's data. The admin can delete employee data if the employee is no longer working at the company. The process of managing employee data is very important because employee data is used to complement employee attendance and payroll data at the company.

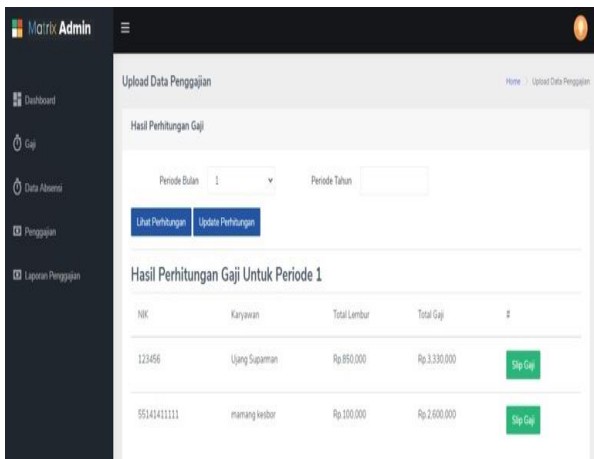


Fig. 9 Management process of employee salary calculation

Fig.9 above shows the process of managing employee salary calculations carried out by HRD and Accounting staff. This page functions to manage salary data prior to calculating employee salaries by HRD and Accounting Staff. After employees do the attendance data, the system will display this page in the Payroll menu. HRD and Accounting staff can see the updated salary calculations by HRD staff by selecting the month and filling in the year, then clicking the "view salary calculation" button. The system will display the salary calculation results based on the selected period. If no data is displayed, the HRD staff

has not carried out the process of calculating the salary based on the selected period.

HRD staff can calculate employee salaries by selecting months and filling in the year, then clicking the update button for salary calculations. The system will then generate a salary calculation form that functions to carry out the next process, namely the employee salary calculation process. This page serves to calculate employee salaries by HRD and accounting staff. HRD and Accounting Staff can only access this page. This page serves to perform the process of calculating employee salaries. In this process, HRD staff can update the employee salary calculation after the attendance data is completed. The system will then display a Salary Calculation form where HRD staff are asked to update salary data such as basic salary, allowances, overtime, and deductions. After all, data is filled in, HRD staff can click the Add Calculation button. Salary calculations that have been updated by HRD are stored in the system and can be seen by Accounting. Then Accounting records the total employee salary and gives it to the manager to ask for approval. In addition, on this page, HRD staff can view employee payslips by clicking the salary slip button on the selected employee. On this page, the employee salary chosen slip can be printed.

IV. CONCLUSION

The conclusions that can be drawn from the Human Capital Management System are as follows:

- This information system is integrated between attendance and payroll systems in the salary calculation process; the company can minimize errors in the existing payroll calculation process.
- The Information system stores employee salary data in an employee salary database that can be stored regularly.
- Information system for the process of storing and managing employee personal data stored in a database using MySQL.

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