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SISTEM INFORMASI PENGGAJIAN PADA CV. CAKRA MAS JAYA BERBASIS *WEB* MENGGUNAKAN *RAPID APPLICATION DEVELOPMENT*

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Abstract. CV. Cakra Mas Jaya Gondanglegi operates in the cigarette manufacturing industry. The company is divided into four divisions, namely the roll division, packaging division, tobacco division, and staff division. Based on interviews conducted in this study with the manager of CV. Cakra Mas Jaya, it was found that payroll recording is still performed using spreadsheets. The process begins with Supervisors in each division recapitulating employee attendance and overtime data, which is then submitted to HRD for salary calculation. After the calculation is completed, HRD submits the results to the manager for salary disbursement. Subsequently, HRD distributes the salaries to the Supervisors of each division. The purpose of this study is to design and develop a web-based employee payroll information system to assist HRD in managing payroll data based on employee attendance. In this research, the method used is Rapid Application Development (RAD). Black Box Testing has been conducted through system trials and revisions until it meets user requirements and system design specifications. Furthermore, the results of User Acceptance Testing (UAT) show an overall average of 92.93%, indicating that the developed payroll information system is able to assist Supervisors and HRD in processing employee payroll more effectively and efficiently.
Keywords: Information System, Payroll, Rapid Application Development

INTRODUCTION

Employee payroll is a system that regulates the payment of salaries to employees for the services they provide within an organization or company (Haerani et al., n.d.). Similarly, CV. Cakra Mas Jaya Gondanglegi also carries out employee payroll activities once a week. This company operates in the cigarette manufacturing industry with a total of 571 employees, consisting of factory workers and staff members, including managers, administrators, HRD personnel, production supervisors, and deputy production supervisors.

Based on an in-depth interview with the manager of CV. Cakra Mas Jaya, it was found that payroll recording is still carried out using spreadsheets and manual documentation in the form of physical documents. This system has several weaknesses, such as the risk of errors in calculating basic salaries, overtime pay, and allowances, as well as difficulties in tracking employees' payroll histories. Negligence also frequently occurs, such as the exchange of attendance records and the recap of total rolling and packaging performance, as well as delays in employee salary payments, which may lead to errors in recording attendance and overtime. The absence of an automated system also requires the HRD department to manually check and recalculate each salary component, including allowances. In addition, HRD staff must print employee salary slips individually, resulting in a time-consuming process.

The research conducted by Myra Adriana (2022) explains that the implementation of a web-based employee payroll information system can overcome time efficiency problems, reduce the risk of exchanged data recaps due to the use of ledgers, and improve data security. A rapid and flexible system development method that can be used is Rapid Application Development (RAD).

Based on the problems described above and in accordance with previous research, the author conducted a study entitled **"DESIGN AND DEVELOPMENT OF A WEB-BASED EMPLOYEE PAYROLL INFORMATION SYSTEM AT CV. CAKRA MAS JAYA USING RAD"** as an effort to minimize salary calculation errors, organize the payroll process, and minimize the exchange of attendance recap data used for payroll processing. This method consists of several important stages, including Requirements Planning, System Design, Development Process, Testing, and Implementation/Completion (Syahru et al., n.d.). RAD was chosen because this method is suitable for application development projects that require fast implementation (Saraswati, 2021). In addition to enabling rapid system development, RAD also allows for lower investment costs compared to traditional development methods.

RESEARCH METHODS

The Rapid Application Development (RAD) method was chosen because it aligns with the characteristics of the payroll information system development at CV. Cakra Mas Jaya, which requires a relatively short development period, intensive user involvement, and the possibility of changing requirements during the development process. According to (Liu et al., n.d.), RAD is a software development model that emphasizes rapid development cycles through iterative prototype construction, allowing users to provide feedback at each stage of the development process.

Furthermore, (Sommerville & Sommerville, n.d.) stated that RAD is highly suitable for projects with a clear scope and limited completion time because each iteration enables system improvements based on user evaluations. In this study, the involvement of managers, HRD personnel, and supervisors in the process of identifying requirements to evaluating the system makes RAD an appropriate method for developing a payroll system that meets the company's business processes. Similarly, (Martin) explained that the prototype–test–refine cycle is a key characteristic of RAD, enabling user requirement changes to be accommodated quickly throughout the development process. There are four stages in the development process using the RAD method (Nurman & Kusuma, 2021).

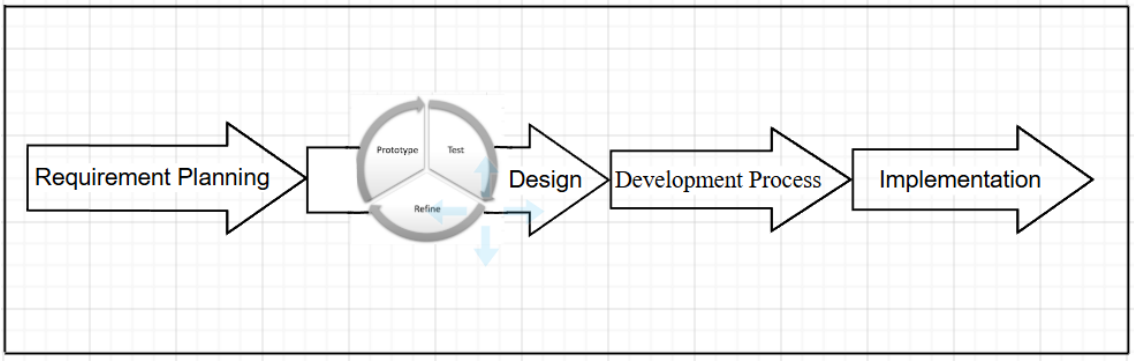


Figure 1. Rapid Application Development (RAD) Development Model

a) Requirement Planning
At this stage, problem identification and data collection are carried out based on information obtained from users. The purpose of this stage is to identify the final objectives of the system and determine the required information needs. At this stage, the involvement of both parties is very important in identifying the requirements for system development.

b) Design
In the system design stage of the Rapid Application Development (RAD) method, there is an iterative process consisting of prototype, test, and refine activities. The prototype stage involves creating an initial system model developed based on the requirements that have been analyzed previously. The purpose of this stage is to provide users with an initial overview of the system flow and functions, making it easier for users to understand the system.

Furthermore, the test stage is carried out to evaluate the developed prototype by directly involving users. The next stage is refine, which is the process of improving the system based on the test results and user feedback. At this stage, errors are corrected and system features are adjusted according to user requirements. The prototype, test, and refine processes are carried out repeatedly until the system achieves optimal results and is ready for implementation.

c) Development Process
At this stage, the approved system design is transformed into an application. During this process, programmers continuously develop and integrate various system components while considering feedback from users. If the process runs smoothly, it can proceed to the next stage. However, if the developed application does not meet the requirements, the programmers will return to the system design stage for further improvement.

d) Implementation
This stage is the process where programmers implement the previously approved system design. Before the system is implemented, testing must be conducted to detect errors within the system. At this stage, users can provide feedback on the developed system and give approval regarding the final system implementation.

RESULTS AND DISCUSSION

1. Requirements Planning

The Requirements Planning stage is conducted to identify problems and user requirements related to the payroll process at CV. Cakra Mas Jaya. At this stage, data collection is carried out through interviews with the manager, HRD personnel, and one of the employees of CV. Cakra Mas Jaya. Based on the results of the interviews and observations, functional and non-functional requirements are obtained, as presented in the table below::

Table 1. Functional Requirements

No	Activity	Description	User	Input	*Output*
1	*Log in*	Allows users to access the system using a username and password	Admin, HRD, Manager, and Employees	*Username, password*	*Dashboard according to user role*
2	*Division Data Setup*	Allows the admin to manage master division data used in the system	Admin	Division code, division name, basic salary, and overtime pay	Position list
3	*Employee Data Setup*	Describes the process of inputting complete employee data	Admin	Position code, position name, and allowance	Position list

4	*Employee Data Setup*	Describes the process of inputting complete employee data	Admin	Name, address, division, position, username, password	Saved employee data list
5	*Tobacco Type Data Setup*	Allows the admin to manage tobacco type data used for payroll purposes	Admin	Tobacco name, description	Saved tobacco type data
6	*Cigarette Product Data Setup*	Allows the admin to manage cigarette product data used in the salary calculation process	Admin	Product name, tobacco type	Saved cigarette product data
7	*Cigarette Grade Data Setup*	Allows the admin to manage cigarette grade data associated with the payroll system	Admin	Cigarette product, description	Saved cigarette grade data
8	Production Division Attendance for Rolling Type	Describes the process of inputting daily attendance and overtime data	*Supervisor*	Date, week, cigarette product, rolling employees	Rolling attendance data
9	Production Division Attendance for Packaging Type	Describes the process of recording attendance, overtime, and work result recaps	*Supervisor*	Date, week, cigarette product	Packaging attendance data
10	Tobacco Division Attendance	Describes the process of recording attendance, overtime, and employee work result recaps	*Supervisor*	Date, week, tobacco type, employees	Tobacco attendance data
11	Staff Attendance	Describes the process of recording staff attendance for monthly payroll recap purposes	*Supervisor*	Date, week, staff data	Staff attendance data

12	Payroll Management for Rolling Production Division	Describes the process of inputting work result data, attendance, and employee overtime for automatic salary calculation	HRD	Attendance data	Rolling payroll recap
13	Payroll Management for Packaging Production Division	Describes the process of inputting work result data, attendance, and employee overtime for automatic salary calculation	HRD	Attendance data	Packaging payroll recap
14	Payroll Management for Packaging Production Division	Describes the process of inputting and calculating salaries based on attendance and overtime data	HRD	Attendance data	Tobacco payroll recap
15	Staff Payroll Management	Describes the process of inputting and calculating staff salaries	HRD	Attendance data	Staff payroll recap
16	Lihat Dan Cetak Slip Gaji	Describes the process of viewing salary data and printing payslips	Employee	Period, employee name	Payslip in PDF format
17	View Payroll Report	Describes the process of viewing payroll data recapitulation	Manajer	Selected Period (weekly/ monthly)	Weekly/ monthly payroll report
18	*Logout*	Describes the process of users exiting their system accounts	Admin, HRD, Manager, and Employees	Click the Logout button	Redirected to the Login page

Table 2. Non-Functional Requirements

No	*Software Name*	Description
1	*Windows*	Server operating system
2	*Laragon / apache web server*	Used to activate local PHP, Apache, and MySQL servers

3	*Google chrome / firefox*	*Web browser to access the system*
4	*Sublime text / VS Code*	*Source code editor for system development*
5	*MySQL / phpMyAdmin*	*Database management system*
6	*PDF generator library (dompdf/mpdf)*	To print pay slips in PDF format

Table 3. Hardware Requirements

No	*Hardware Name*	Spesification
1	*Processor*	AMD ATHLON SILVER (mini mal)
2	*Random Access Memory* (RAM)	2 GB
3	SSD *Memory Storage*	SSD storage over 256 GB is recommended and can be faster

2. Design

At this stage, the system design was carried out using UML (Unified Modeling Language) modeling to make it easier for researchers to describe how the system will work. The design began with the preparation of a Use Case Diagram to illustrate the interaction between actors and the system, then continued with a Class Diagram as the basis for designing data structures and relationships between classes. Based on this model, researchers developed a system interface prototype that includes key features, such as login, employee data management, attendance, payroll, payslip printing, and payroll reports.

The prototype was then evaluated with users, including managers and HRD at CV. Cakra Mas Jaya, to ensure that the business process flow, information requirements, and interface met user needs. The evaluation yielded several inputs, including adjustments to the attendance input flow, improvements to the payroll calculation process based on attendance and overtime data, and improvements to the report and payslip displays for better understanding.

Based on this input, the prototype was refined. The evaluation and refinement process was carried out iteratively until the prototype was deemed to meet user needs and approved as a reference for the system development phase. This iterative approach aligns with the characteristics of the Rapid Application Development (RAD) method, which actively involves users in refining the design so that the resulting system better aligns with the company's operational needs.

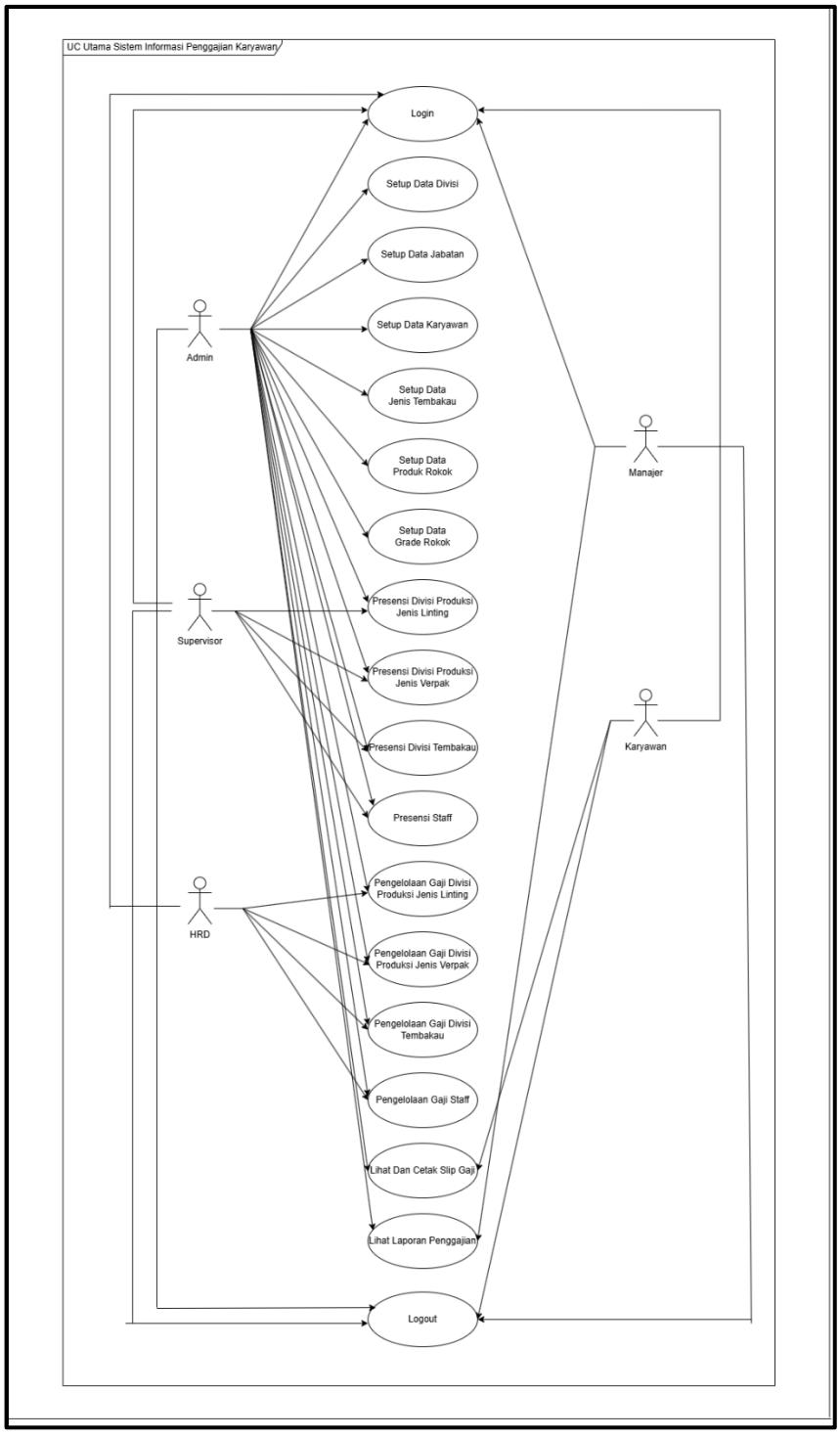


Figure 1. ***Use Case Diagram*** **Utama**

This Main Use Case Diagram illustrates the entire payroll system workflow, from employee data input, daily attendance, automatic salary calculation by the system, to salary printing and reporting. All of these flows involve coordination between divisions, so the system is designed modularly and structured based on the needs of each actor. This diagram serves as the basis for creating other diagrams.

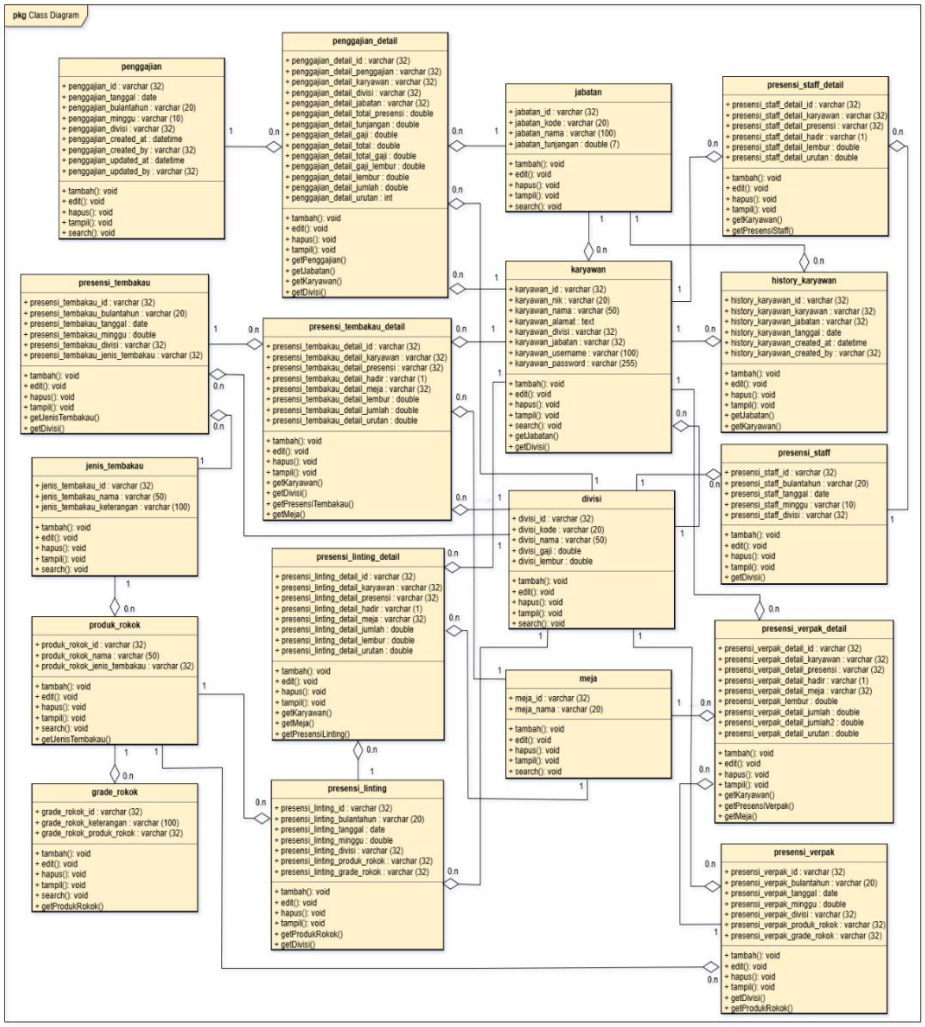


Figure 2. ***Class Diagram***

Class Diagram is a diagram that shows the classes or packages used to fulfill one of the package requirements that will be used later.

3. Process of developing or collecting feedback

The system page layout implementation aims to facilitate interaction between users and the system, thus enabling effective and efficient payroll data management. The payroll website layout at CV. Cakra Mas Jaya is as follows.

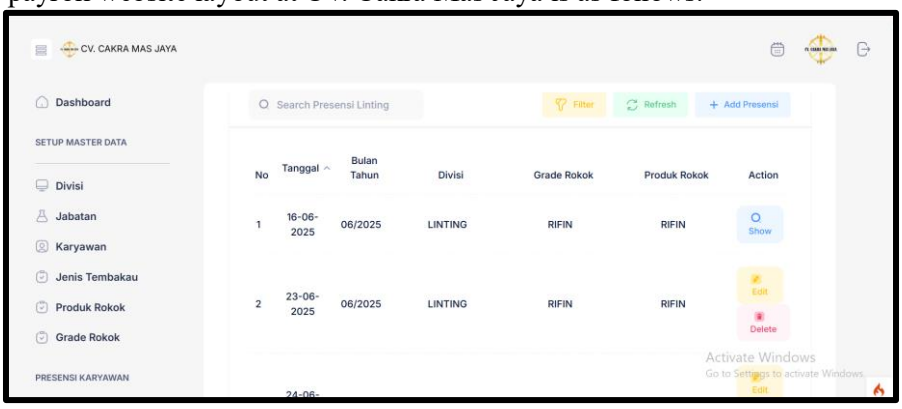


Figure 3. Linting Employee Attendance Display

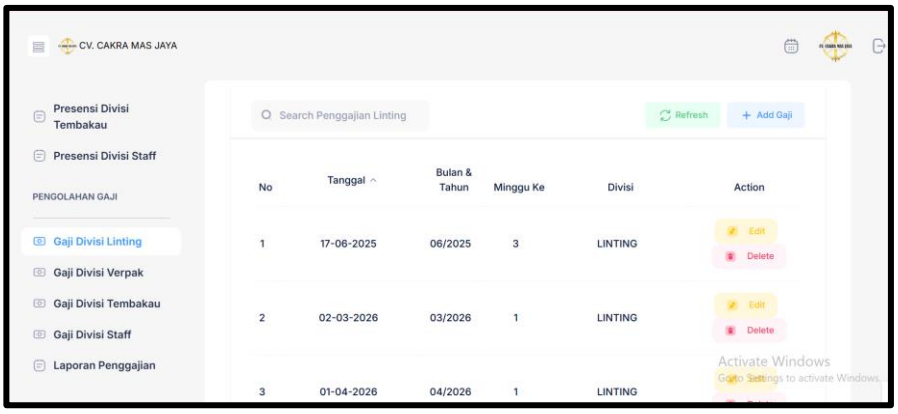


Figure 4. Rolled Division Salary Management View

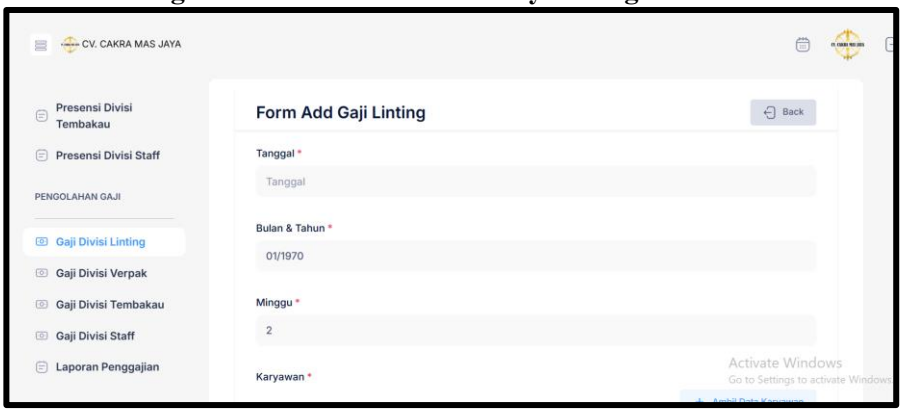


Figure 5. Linting Payroll Add View

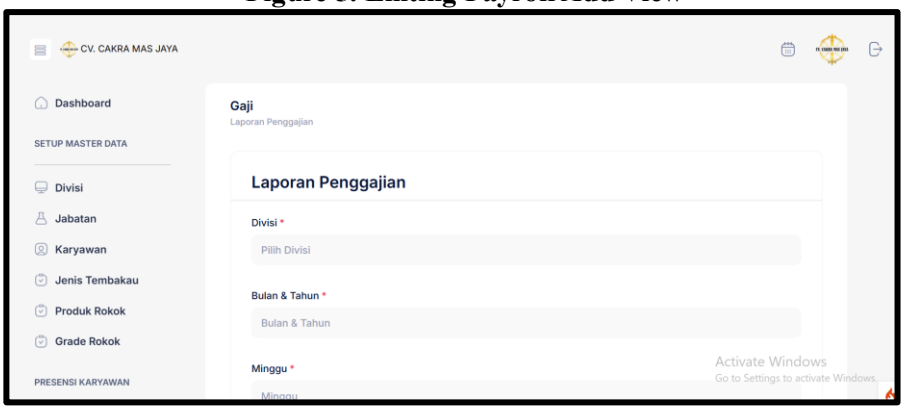


Figure 6. Payroll Report View

4. Implementation or completion of the product

This implementation phase uses Black Box Testing and User Acceptance Testing (UAT) methods. Black Box Testing is a testing strategy whose tests are derived from the details of a program or item (Mintarsih, 2023). User Acceptance Testing (UAT) is the process of verifying that the solution created in the system is suitable for the user. UAT testing ensures that users receive the solution (Suprapto, 2021). The goal is to ensure the system runs according to user needs and is ready for implementation.

Table 4. Black Box Testing Table

NO	Features Tested	Scenario	Expected Results	Test Results	Explanation
1	Rolling division presence (See Data)	Press the roll division presence menu	The system will display rolling attendance data	The system successfully displays the rolling attendance data.	Suitable
2	Rolling division salary (Add Rolling Payroll)	Press the add payroll button	The system displays the rolling payroll form and successfully saves the data.	The system successfully input payroll data and saved it in the database.	Suitable
3	Payroll Report	Press the payroll report menu button	The system displays payroll report data	The system successfully displays employee payroll report data	Suitable

INFERENCE

From the research results that have been conducted, it can be concluded that the web-based employee payroll information system at CV. Cakra Mas Jaya was successfully designed and built using the Rapid Application Development (RAD) method, which includes the stages of requirements planning, system design, process development and feedback collection, and finally implementation or product completion. The activity begins with the supervisor of each division recording employee attendance and overtime. Then, HR calculates the money and sends it to the employee. After completing the calculation, HR sends it to the manager to record the salary. After the salary is paid, HR will give it to the supervisor of each division, who will then distribute it to the employee.

The steps for creating a web-based payroll system for employees using the RAD method are as follows: 1) Requirements planning 2) System design 3) Feedback gathering process 4) Product usage or completion. The results of Black Box Testing showed that the system functioned as needed, and an average score of 92.93% in User Acceptance Testing (UAT) indicated that users could accept the system. This system was then distributed to supervisors in each division, who would then provide it to employees.

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