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Development of a Web-Based Payroll Information System Using Extreme Programming

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ABSTRACT

Arj88 Store operates in the clothing retail sector and currently relies on spreadsheet-based tools for employee payroll processing. This approach requires repetitive verification, is time-consuming, and increases the risk of errors, particularly in managing salary components such as benefits, deductions, and payroll-related reports. To address these limitations, this study adopts the Extreme Programming (XP) methodology due to its flexibility, rapid feedback cycles, and close collaboration with stakeholders during system development.This research focuses on the design and development of a web-based payroll information system tailored to the operational needs of the organization. The proposed system integrates employee data management, automated payroll calculations, and report generation into a single platform, enabling more efficient and accurate payroll processing. The implementation results demonstrate that the developed system significantly reduces processing time and improves data consistency in payroll management.System validation was conducted using the Black Box Testing method, comprising ten testing scenarios designed to evaluate the functional requirements of the system. The testing results indicate that all core system functionalities operate as expected and meet the predefined testing criteria. Overall, the proposed web-based payroll information system effectively enhances the efficiency and accuracy of payroll data processing and can serve as a practical solution for similar small-to medium-sized enterprises.

1. Introduction

Information systems have been increasingly integrated into various aspects of everyday business, including accounting, finance, operational management, marketing, human resource management and other key business functions. The necessary data is managed and processed automatically by the system. This development aims to replace manual processes with computerized solutions, increasing the effectiveness and efficiency of company operations .[1]–[3]

A payroll information system is a set of procedures and techniques used to collect and manage data so as to produce effective information to meet payroll needs. Supervision of labor costs aims to achieve work efficiency and determine the appropriate level of compensation (salary), with the aim of maintaining optimal labor quality. The amount of salary received by each employee varies according to the position or position they hold .[4], [5]

Extreme Programming (XP) methodology was chosen for its flexibility, quick feedback and direct involvement with the company[6] . This method allows quick adaptation to changes, detects problems immediately and ensures a good understanding of the company's needs. With values such

as simplicity of code and close team and company collaboration, Extreme Programming (XP) aims to create a high-quality software that can satisfy the company .[7]–[9]

Arj88 Store is one of the companies engaged in the trading industry, especially clothing. Until now Arj88 Store has a total of 13 branches spread across Bali, so it has a wide range in marketing its products. In marketing its products Arj88 Store takes two marketing approaches, namely offline stores and online stores.

The calculation of employee salaries at Arj88 Store still relies on the Microsoft Excel program, which requires repeated checks and takes a long time. The main problem in the process of calculating employee salaries is the difficulty in processing payroll data, including overtime allowances, sales allowances and salary deductions, which are often not recapitulated properly, because the salary received by each employee is different according to the field they occupy. This causes salaries paid to employees to often be inappropriate[3], [10] , which ultimately harms employees and the company . Therefore, companies face difficulties in managing employee salary calculations properly.

In response to the payroll problems previously described, the author took a proactive step by designing a web-based payroll information system at Arj88 Store. This system aims to simplify and improve the efficiency of the payroll process. With this system, employee payroll data will be archived properly, and errors that have occurred before can be avoided. This will bring benefits in processing employee salaries and help create a more effective and efficient process. Effective in processing employee salary calculations accurately and efficient in saving time, as well as reducing errors that may occur.

2. Literature Review

Various previous studies have shown that many payroll processes in organizations and companies are still done manually or semi-manually, such as using electronic worksheets. This condition often causes various problems, including the length of the salary calculation process, the high risk of data input errors, delays in salary payments, and difficulties in preparing accurate payroll reports[1], [2] . These problems generally occur in educational institutions, service companies, and developing companies with an increasing number of employees.

A number of studies have developed web-based payroll information systems as a solution to these problems. The results show that the implementation of a payroll information system is able to improve the efficiency of the salary calculation process and minimize data recording errors[5], [11] . The system developed can generally manage employee data, calculate salaries automatically, and generate reports and pay slips quickly and accurately. With a computerized system, the payroll process becomes more structured and easily controlled by the finance department.

Other research also shows that payroll information systems play an important role in improving the timeliness of salary payments and transparency of calculations[3], [10] , especially in companies with a relatively large number of employees or have branches in various locations. In addition, the management of additional salary components, such as allowances and bonuses, can be done more objectively and consistently through an integrated system.

In general, the results of previous studies confirm that the development of a web-based payroll information system is an effective solution to replace the conventional payroll process. The system not only helps speed up the administration process, but also improves accuracy, efficiency, and accountability in payroll management. These findings form the basis for future research to develop a more adaptive payroll information system by utilizing appropriate software development methods, such as the Extreme Programming approach, to produce a system that is flexible and responsive to user needs.

3. Research Methods

Extreme Programming (XP) is one of the process models of Agile Software Development which is one of the Methodologies in the development of Software Development Life Cycle (SDLC) based systems. Extreme Programming (XP) is an approach or model of software development that tries to

simplify the various stages in the development process so that it becomes more adaptive and flexible .[6]–[8]

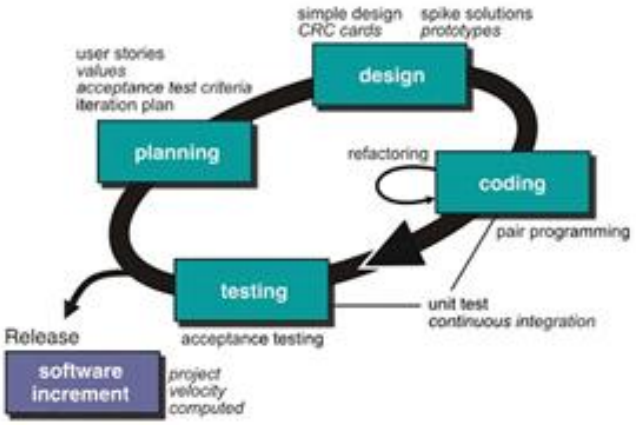

Fig.1. Extreme Programming Method

a. Planning
   Planning is a methodical process designed to achieve specific goals and decision making to achieve the desired results.
b. Design
   Design is an activity in software development that aims to organize logical patterns in the system.
c. Coding
   Coding is the activity of applying the modeling that has been made into the form of a user interface using a programming language.
d. Testing
   Testing or testing is an activity of testing the system that has been designed in the hope that it is in accordance with what is desired.

4. Results and Discussions

System Implementation

Dashboard User Interface

The admin dashboard page is a display that will show a summary of employee attendance which includes the total number of employees, the number of those present, those absent, and those late on that day. In addition, there is a graph of the development of employee attendance during a certain period to provide an overview of employee attendance. Employee clock-in and clock-out information is also presented on this page. With this design, the admin can quickly understand all the information that has been presented on the system.

Fig.1. Dashboard User Interface

Employee Menu User Interface

The employee page is a page that contains all information about employee data in the Arj88 Store. On this employee page, you can also search for employee data in the employee page *search box.*

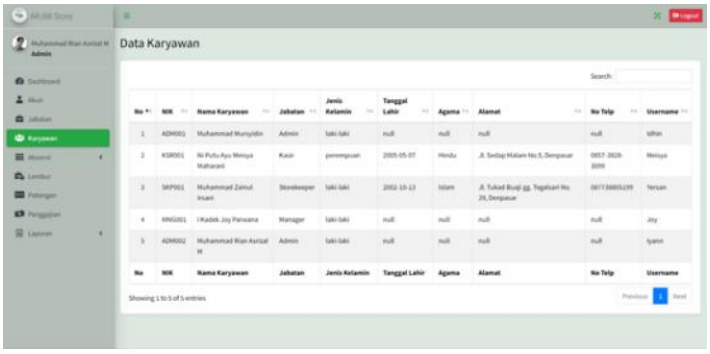

Fig.2. Employee Menu User Interface

Attendance Menu User Interface

The attendance data page is a page that provides attendance information from each employee. On the attendance data page there is information about incoming employee data and employee data who are absent and late employees.

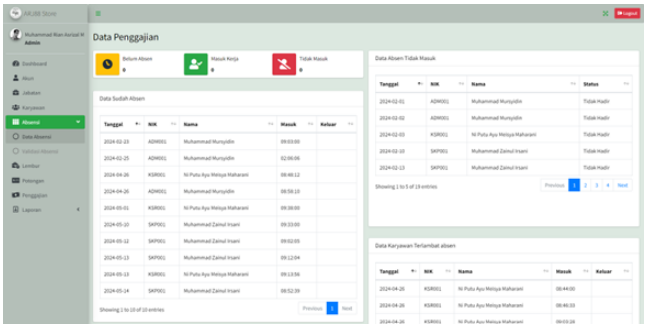

Fig.3. Attendance Menu User Interface

Overtime Menu User Interface

The overtime page is a page used to manage employee overtime data. On this overtime page also provides information about each employee's overtime data. On this overtime page, you can also add new overtime data by pressing the add overtime button and the search box functions to search for data on the overtime page.

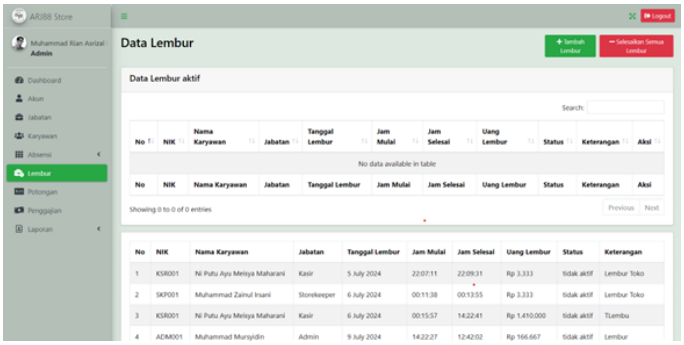

Fig.4. Overtime Menu User Interface

User Interface of Deductions Menu

The late deduction report page is a page that contains a recap of employee late payroll deduction data. On this page the admin can find out the recap of late deductions for the desired period.

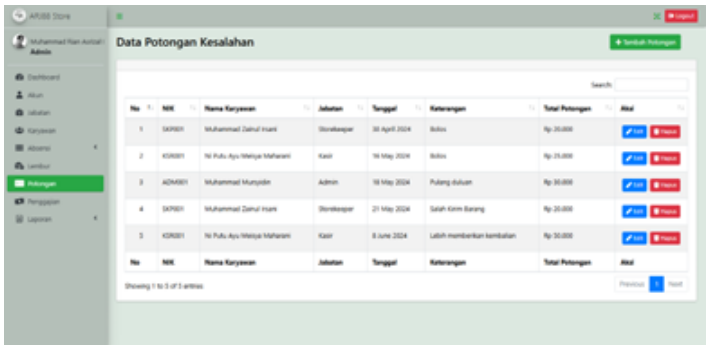

Fig.5. User Interface of Deductions Menu

Payroll Menu User Interface

The payroll page is a page used to process employee payroll or create employee payroll data by the admin. This payroll page also provides information data regarding the payroll of each employee.

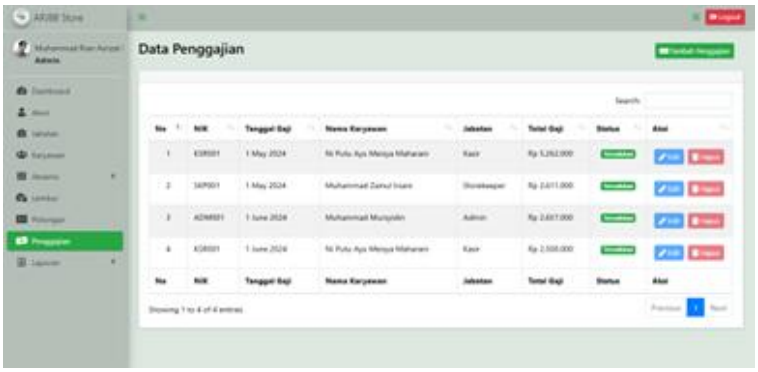

Fig.6. Payroll Menu User Interface

5. Conclusion

This information system is designed and built to overcome the problems of the current employee payroll process at Arj88 Store. In addition, it can also facilitate the performance of related parties at Arj88 Store to be more effective and efficient. The result of this research is a web-based payroll information system. This information system can manage and process payroll at Arj88 Store, starting from the employee attendance process, processing employee payroll to the process of printing reports related to employee payroll at Arj88 Store. The results of system testing using the Black Box Testing

method as many as 10 (Ten) scenarios on the payroll information system at this Arj88 store and are in accordance with testing standards based on the system test scenarios that have been made.

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