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Designing a Performance Evaluation and Payroll System Using the ADDIE Model

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Abstract

Research aim : *This research aims to design and develop an information system that integrates performance evaluation and payroll to enhance efficiency, transparency, and accuracy in human resource management.*

Design/Methode/Approach : *This study uses the ADDIE model to design a performance evaluation and payroll system without full implementation.*

Research Finding : *This research designs an integrated performance evaluation and payroll system to improve efficiency, transparency, and accuracy in HR management using the ADDIE model.*

Theoretical contribution/Originality : *This research proposes a new conceptual model that integrates performance evaluation and payroll in one digital system, overcoming the limitations of previous studies with AI and data-driven approaches.*

Practitionel/Policy implication : *This research is expected to create a more efficient, transparent, and data-based performance evaluation and payroll system to evaluate performance and improve compensation fairness.*

Research limitation : *This research is only limited to discussing the evaluation and payroll system and only focuses on planning related to system creation.*

Keywords : management information system, Performance Evaluation, Payroll

1. Introduction

Along with the rapid development of technology at this time gave rise to various innovations to be able to increase efficiency, effectiveness, and convenience in various activities [1]. Technological developments such as the existence of information systems are things that can support the optimization of the human resources sector, such as the use of systems in managing employee performance evaluations and employee payroll. Performance evaluation is a very important thing in today's modern work environment. This is very important because the performance evaluation assessment is used to measure the extent of employee achievement in the company. The purpose of performance appraisal evaluation is also used to improve employee performance from the results of the evaluation that has been carried out. Information systems related to performance evaluation are important to create to

be able to facilitate the measurement of employee performance achievements from the results of evaluations that have been carried out [2]. Employee performance evaluation also has the aim of communicating job expectations and goals within a certain period of time relative to the collective goals set by an organization [3]. The results of the performance evaluation can later be used by managers to design strategies and measure them over time [4]. The use of a performance evaluation system can help companies realign employee performance to meet evolving organizational goals [5]. In addition to performance evaluation, employee payroll at the company must be carried out professionally to avoid salary manipulation by certain parties. Manual payroll processes can be labor-intensive, error-prone, and time-consuming, resulting in costly errors and compliance issues [6]. Payroll management in the absence of procedures in it will result in disappointment in employees and will be detrimental to the company. Information systems related to payroll in the company need to be created to make the payroll system carried out professionally and transparently within the company [8]. Automated payroll systems offer various features and benefits that can increase efficiency in managing payroll in the company. With this system, companies can monitor payroll data in real-time, thus enabling more effective and accurate management of employee compensation, deductions, and compliance with tax regulations [7].

A number of studies have examined the implementation of information systems in performance evaluation and payroll to improve the efficiency of human resource management. Research conducted by Hermawan et al. shows that the performance evaluation information system can display performance evaluation results to the company, so that the company can see the quality of employee performance. The system can also produce an evaluation of employee performance so that it can be a benchmark for improving employee performance even better in the future [9]. In addition, there is research by Shalahudi et al. which suggests that the existence of a performance appraisal system can increase transparency in the assessment process, motivate employees, and optimize management effectiveness in performance evaluation, thereby supporting increased productivity and achieving overall organizational goals. Furthermore, there are several studies on the implementation of the payroll system [10]. Research from Irawan et al. results in that the information system on payroll can produce information quickly, precisely, and accurately if information related to payroll is needed for analysis for related parties. The payroll system can also reduce the level of errors in understanding related to payroll and facilitate the preparation of payroll reports and salary slips quickly [11]. Research from Lokugama suggests that an automated payroll system can be a good solution to the problem of accurate cost estimation and help the finance department to make a decision in analyzing costs [12].

Although there have been many studies that discuss information systems for performance evaluation and payroll [13,14], most of them still focus on the technical aspects of their development or only optimize one aspect without integrating it thoroughly. Some previous studies have focused more on automating the payroll process, but have not included performance evaluation data as a basis for determining employee compensation. On the other hand, there are also studies that develop digital-based performance evaluation systems, but have not linked them directly with payroll systems to create more transparent and data-driven compensation policies [15]. In addition, existing research rarely explores how this system can be maximally utilized in supporting strategic management.

This research offers novelty by presenting a performance evaluation and payroll information system that not only functions as an administrative tool, but also supports

strategic decision making. With this system, management can integrate real-time performance data with payroll management, so that compensation policies can be made more objectively, transparently, and data-based. In addition, the application of artificial intelligence-based analysis allows management to identify productivity patterns, predict potential employee turnover rates, and design more effective performance improvement strategies. The system is also designed with high flexibility, so that evaluation parameters can be adjusted to the needs of the organization to be more adaptive to changes in the business environment.

This research aims to design an information system that combines performance evaluation and payroll in one digital platform to improve efficiency and transparency in human resource management. The system is developed to assist companies in assessing employee performance more objectively while linking it to compensation policies that are based on data. With the application of cloud-based technology and artificial intelligence, the system is expected to provide more accurate analysis of employee productivity and support management in making strategic decisions related to workforce management.

1.1. Statement of Problem

Although information systems have been widely used in the performance evaluation and payroll processes, there are still a number of challenges that have not been overcome, especially in terms of integrating these two aspects in a fully integrated system. Most of the previous studies focused more on the technical aspects of system development or only optimized one part without considering the direct relationship between performance evaluation and payroll policies. As a result, many companies still experience difficulties in determining compensation objectively and data-driven, potentially leading to employee dissatisfaction and inefficiency in human resource management [16]. In addition, the use of artificial intelligence in analyzing employee productivity patterns and providing more precise compensation policy recommendations has not been widely discussed in previous research. Another challenge is how this system can be adapted by companies that have limited resources, but can still improve efficiency, transparency, and accuracy in managing employee performance evaluation and payroll. Therefore, it is necessary to develop an information system that can integrate these two aspects in real-time and provide added value to management in making more data-based decisions.

1.2. Research Objectives

This research aims to design and build an information system that integrates performance evaluation and payroll to improve efficiency, transparency, and accuracy in human resource management. The developed system is expected to be able to assist companies in objectively assessing employee performance and linking it directly to data-based compensation policies. With the support of cloud-based technology and artificial intelligence, this system is designed to produce more precise analysis of employee productivity, identify performance patterns, and provide strategic recommendations for management in the decision-making process. In addition, this research also seeks to present a system that is flexible and easily customizable, so that it can be applied by companies of various scales.

2. Method

This research is a qualitative study with the Research and Development (R&D) method to design and develop a performance evaluation information system and employee payroll. The data used is primary data collected through literature studies and interviews with HRD. The development model used is ADDIE, which consists of five main stages: Analysis, Design, Development, Implementation, and Evaluation. Each stage is used systematically to ensure the system developed is in accordance with the needs of the company.

3. Results and Discussion

The ADDIE method (Analysis, Design, Development, Implementation, Evaluation) is a systematic approach used in system or program development. In this research, the ADDIE method is used to analyze, design, and evaluate the performance appraisal and payroll system designed to be more transparent, efficient, and in accordance with company needs. The following is an ADDIE analysis in the designed system [17]:

3.1. Analysis

The analysis stage is the first step in the ADDIE method which aims to understand the needs of the system, identify existing problems, and determine appropriate solutions. At this stage, data collection is carried out related to company needs, stakeholders involved, regulations that must be obeyed, and obstacles that may be faced in the old system. The results of this analysis become the main basis in designing the system to be more effective and in accordance with organizational goals.

a. Identification of Company Needs
   1) Efficiency in HR management: Reduce HRD manual work in performance evaluation and payroll processes by automating KPI calculation, attendance, and payroll.
   2) Transparency in performance evaluation: Provide access to employees to view evaluation results, KPI reports, and salary calculations in real-time through a web-based system or application.
   3) Accuracy in salary calculation: Avoiding errors in the calculation of allowances, bonuses, and tax deductions by applying algorithms that have been configured according to company regulations.
   4) Regulatory compliance: The system must comply with labor laws related to minimum wage, income tax (PPh 21), and BPJS deductions to ensure legal compliance.

b. Analysis of Stakeholders Involved
   1) Human Resourch: Responsible for managing performance evaluations, drafting compensation policies, and ensuring the accuracy of payroll data.
   2) Manager: Appraise employees based on predetermined KPIs and provide performance-related feedback.
   3) Employees: Receive performance evaluations, view digital payslips, and raise objections if there are any discrepancies in appraisals or payroll.
   4) Finance Team: Manage payroll payments, ensure tax and BPJS deductions are in accordance with regulations, and integrate the system with banks for automatic payments.

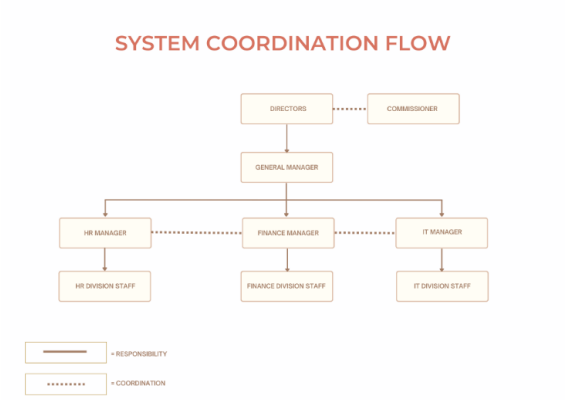

Figure 1: Stackholder System Coordination Flow

c. Regulatory and Policy Analysis
   1) Labor regulations: The system must comply with rules related to minimum wages, benefits, and employee rights, as well as incentive policies applicable in the industry.
   2) Tax regulations: Follow the income tax scheme (PPh 21), BPJS deductions, and other compensation policies.
   3) Company policies: Including policies related to performance bonuses, annual salary increases, and periodic evaluation mechanisms.

d. Identifikasi Kendala dalam Sistem Lama
   1) Potential for data input errors: Human error in entering data can lead to inaccuracies in performance evaluation and salary calculation.
   2) Lack of integration with other systems: The old system was not connected to attendance or HRIS, thus requiring manual data entry which could potentially lead to errors.
   3) User resistance: Employees and managers may have difficulty adapting to the new system, which requires socialization and training.

3.2. Design

After the analysis stage has been carried out and system requirements have been identified, the next step is the design stage. At this stage, the system begins to be developed in the form of a conceptual architecture that includes the system structure, database design, and work process flow. The main purpose of this stage is to ensure that the designed system can run optimally, according to user needs, and has strong security. With careful design, the system can provide convenience in performance evaluation and payroll more efficiently and transparently.

a. System Structure
   1) Performance Appraisal Module: Handles employee evaluations based on KPIs, 360-degree feedback, and attendance data.
   2) Payroll Module: Manage the calculation of salaries, allowances, bonuses, as well as tax and BPJS deductions based on predetermined parameters.
   3) Reports and Analytics Module: Provides data visualization for HR and managers to make data-driven decisions, such as employee performance analysis and compensation trends.

b. Database Design
   1) Employee Table: Stores personal data, job titles, and employment contracts.
   2) Performance Evaluation Table: Contains KPI scores, supervisor feedback, and employee training records.
   3) Attendance Table: Stores employee attendance, tardiness, and overtime data.
   4) Payroll Table: Contains data on salary calculations, allowances, bonuses, and deductions.

c. Process Flow in the System
   1) Managers conduct employee performance appraisals based on predetermined KPIs.
   2) The system processes data from performance appraisals and attendance to calculate the appropriate compensation.
   3) Salary calculation is done automatically based on existing data, taking into account bonuses, allowances, and taxes.
   4) Digital payslips are sent to employees through the system with full details.
   5) The finance team processes salary payments to employee accounts and generates payroll-related financial reports.

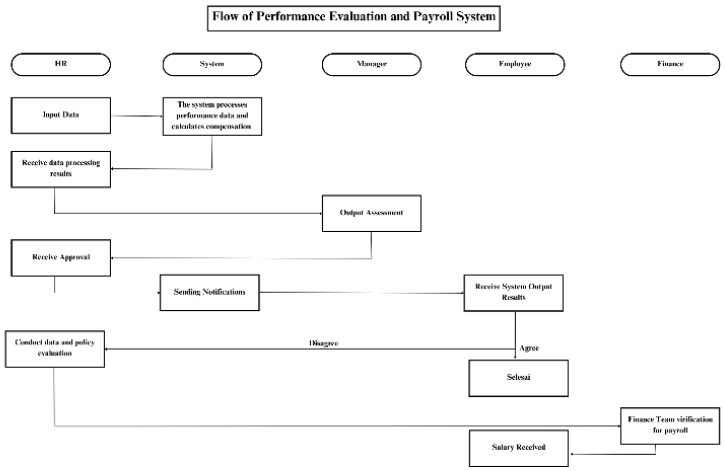

Figure 2. System Flowchart

d. Data Security
   1) Data encryption to protect employee information from unauthorized access.
   2) Multi-factor authentication (MFA) to improve system access security.
   3) Role-based access rights (RBAC) to ensure that only authorized users can access certain information.

3.3. Development

The development stage is the phase where the system design that has been made begins to be realized in the form of prototypes and simulations. At this stage, each element that has been designed is tested to ensure that the system can run according to the needs that have been identified. Although this research does not include full implementation, developing the concept in the form of models and simulations is an important step to assess the effectiveness of the design before it is implemented in real life. The following are some of the main

activities in the development stage: In this research, the development stage focuses more on prototyping or simulating the system without direct implementation.

a. Prototyping
   1) UML diagram to describe user interaction with the system and data flow.
   2) UI/UX mockup to visualize the user interface to make it easier to use.
   3) Simulation of salary calculation with predetermined scenarios to ensure the system runs well.
b. Initial Testing of Concepts
   1) Simulation trials to evaluate the system workflow and detect design flaws.
   2) Database model validation to ensure the integration between tables is optimal and there is no data redundancy.

3.4. Implementation

The implementation stage is a process where the system that has been designed and developed begins to be applied in a real work environment. This implementation includes system installation, integration with other systems, and training for users to operate the system optimally. Although this research only focuses on design without direct implementation, understanding the implementation stage is very important to ensure that the system can be implemented successfully in the future.

a. prepare the appropriate infrastructure such as server selection (cloud or on-premise) as well as database configuration. Data migration from the old system should also be planned to ensure consistency and information security.
b. Integration with Existing Systems, the system needs to be connected to the platforms that the company already uses, such as HRIS for employee management, attendance system for attendance calculation, and financial or banking system for automatic salary processing.
c. Training and Socialization to Users, system users, including HRD, managers, and employees, need to be trained to operate the system properly. User manuals should also be provided to help with adaptation, and technical support should be arranged to handle any problems that arise.
d. Initial Trial and Evaluation, before the system is fully utilized, it is necessary to conduct a trial with dummy data to identify potential bugs or errors. If discrepancies are found, improvements should be made immediately before the system is officially implemented.

3.5. Evaluation

The evaluation stage is the final step in the ADDIE method which aims to assess the extent to which the system that has been designed meets the needs and objectives that have been set. This evaluation is done to ensure that the system functions properly, has high accuracy, and is acceptable to users. In this research, the evaluation focuses more on reviewing the design and simulation of the system before the actual implementation is carried out. Evaluation is divided into two main types, namely formative evaluation which aims to improve the system during the development stage and summative evaluation which aims to assess the overall effectiveness of the system.

a. Formative Evaluation
   1) Prototype testing with stakeholders to identify design weaknesses before further implementation.

2) Simulation of the performance evaluation and payroll process to assess the accuracy of the system.

b. Summative Evaluation

1) Reviewing the effectiveness of the system in improving transparency and efficiency.

2) Analyze user feedback to improve the design before real implementation.

4. Conclusion

The findings of this study highlight the importance of an integrated performance evaluation and payroll system in improving efficiency, transparency, and accuracy in human resource management. Through the application of the ADDIE model, this study systematically analyzed the needs of the organization and designed a conceptual framework that links performance appraisal with payroll calculation. The proposed system ensures that employee evaluations are directly linked to compensation policies, so as to minimize bias and improve fairness in salary distribution. Moreover, by integrating artificial intelligence-based analytics, the system provides predictive insights into workforce productivity, enabling strategic decision-making in talent management.

This research makes significant contributions in both the academic and practical realms. Theoretically, this research offers a new perspective in integrating performance evaluation with payroll systems in one digital platform, addressing the gap in previous studies that only focused on separate aspects. Practically, the conceptual framework developed can serve as a basis for companies, in developing adaptive and data-driven human resource management solutions. This study also emphasizes the role of cloud computing and artificial intelligence in automating HR processes, thereby improving organizational effectiveness as well as compliance with labor regulations.

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Despite making a meaningful contribution, this research has limitations, particularly in its scope, which focuses only on system design without implementation. The absence of empirical testing means that the feasibility and effectiveness of the proposed framework remains theoretical. Future research could include prototype development, real-world implementation, as well as user acceptance testing to validate the impact of the proposed system. In addition, exploration of the adaptability of this system across different industries and organizational scales will provide deeper insights into its applicability and scalability.

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