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Design of a Web-Based Decision Support System for Employee Performance Assessment at PTSP BP Batam

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Abstract

A web-based Decision Support System (DSS) for employee performance evaluation has become an increasingly important solution in the modern business world, particularly in enhancing the accuracy, transparency, and efficiency of the performance evaluation process within companies. This internship report provides an in-depth discussion on the design and implementation of a web-based DSS using the Simple Additive Weighting (SAW) method at PTSP BP Batam. The primary objective of developing this system is to provide an objective, structured, and user-friendly tool for assessing employee performance, thereby assisting management in making better decisions regarding employee development, promotions, and placements. The Simple Additive Weighting (SAW) method was chosen due to its capability to process both qualitative and quantitative data in an integrated manner, as well as its ease in assigning weights and values to various assessment criteria.In this context, the system is designed to evaluate employee performance based on several predefined criteria, such as productivity, discipline, attendance, teamwork ability, and initiative. Each criterion is assigned a weight according to its level of importance in performance evaluation, ensuring that the final results produced by the system accurately and fairly reflect employee performance. This system is developed utilizing the latest technology, including the Laravel framework, which is well-known for its ability to build scalable and easily manageable web applications. Additionally, a MySQL database is used to store employee data, assessment criteria, and evaluation results, while the PHP programming language is employed to develop business logic and the user interface. This combination of technologies ensures that the system operates smoothly, securely, and efficiently.
Keywords— Decision Support System (DSS), Employee Performance Evaluation, Laravel, MySQL, PHP, PTSP BP Batam

INTRODUCTION

In the increasingly complex era of globalization, large companies such as PTSP BP Batam require effective systems to enhance employee productivity and work quality. One way to achieve this goal is by utilizing a Decision Support System (DSS) to assist in the evaluation and assessment of employee performance. Traditional employee performance assessments are often manual and subjective, making them prone to errors and uncertainties. Therefore, a system that can objectively and accurately evaluate employee performance is necessary. The Simple Additive Weighting (SAW) method is one of the popular techniques used in DSS, as it allows for the integration of various assessment criteria in an easy and accurate manner. [1] The first study by Aulyardha Anindita and Woro Isti Rahayu (2021) revealed that the performance assessment at Kandatel Bone, which previously relied on attendance and weekly reports, could be improved

with a web-based system using the SAW method. The results showed a high user acceptance rate of 89.67%. [2] The second study by Ersa Febriani and Muhamad Muslih (2021) also utilized the SAW method to assess employees based on criteria such as attendance and work quality. They achieved 100% data accuracy after testing the system on 50 respondents, indicating the effectiveness of the system. [3] The third study by Ferdiansyah Laia and Fricles A. Sianturi (2021) examined issues at PT Gamma Engineering, where the selection process for the best employees was conducted manually and was often biased. By implementing the SAW method, they successfully developed a system that provided objective rankings for employees, thereby improving the efficiency of selecting outstanding employees. [4] Thus, the article titled **"Design of a Web-Based Decision Support System for Employee Performance Assessment at PTSP BP Batam"** aims to design a web application that utilizes the SAW method to evaluate employee performance objectively and efficiently. This application is expected to provide accurate assessment recommendations for PTSP BP Batam's management, enabling them to make strategic decisions regarding employee careers.

Decision Support System (DSS)

A **Decision Support System (DSS)** is an information system designed to assist decision-making by utilizing data, mathematical models, and specific analytical techniques. The purpose of a DSS is to support more accurate and effective decision-making by providing relevant and reliable information. DSS can be applied in various fields, such as business, government, healthcare, education, and more. Some common applications of DSS include credit eligibility assessment, employee performance evaluation, inventory management, and strategic planning.[5]

The **Simple Additive Weighting (SAW) method** is a decision-making technique used to select the best alternative from multiple options based on specific criteria. The process involves data normalization, assigning weights to each criterion, and calculating the total score for each alternative. The functions and benefits of SAW include improved decision-making accuracy, time efficiency, and ease of evaluating various alternatives in different fields such as education and human resource management.[7]

RESEARCH METHOD

Data processing is used as a step for researchers to derive conclusions from the conducted study. The data processing process involves mathematical calculations on the proposed inventory policy using the SAW method. The collected data is then used for system design planning with the **Simple Additive Weighting (SAW)** method. The stages of data processing are carried out to address the research objectives, including:

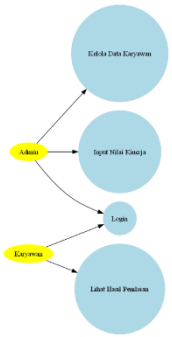
1. Determination of Criteria: Identifying the criteria to be used in employee performance assessment, such as productivity, discipline, and teamwork skills.

2. Data Normalization: Converting data into the same scale for comparison. This is done by calculating the normalized value for each alternative based on the predetermined criteria.
3. Weighting: Assigning weights to each criterion based on its level of importance in the performance assessment.
4. Score Calculation: Calculating the final score for each alternative (employee) by summing the results of multiplying the normalized values by the weights of each criterion.
5. Decision Making: Identifying the best alternative based on the highest final score, which will serve as the recommendation for the employee performance assessment.

RESULTS AND DISCUSSION

Use Case Diagram

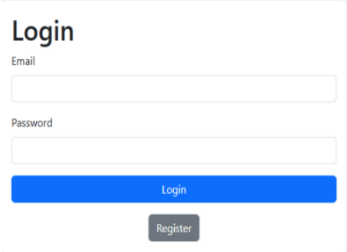
A Use Case Diagram is a diagram used to depict the interaction between actors (users or other systems) and the system to be designed. This diagram identifies the features of the system needed based on user requirements. A Use Case Diagram provides an overview of the system's functionality and the individuals or entities involved in it.[8]



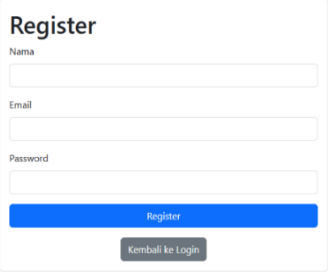
Picture 1. *Use Case Diagram*

Program Implementation

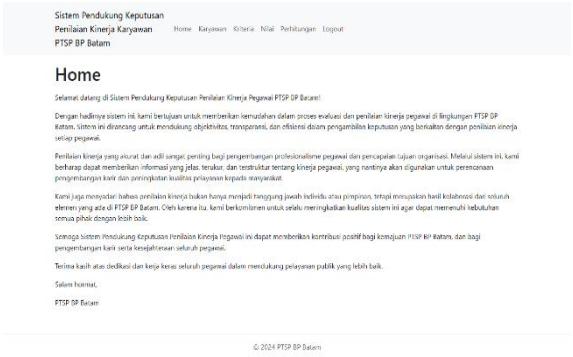
The system implementation phase involves translating the analyzed design into code in a specific programming language and deploying the developed software in a real-world environment. Additionally, it includes the implementation of necessary hardware such as servers, networks, and sensors. This phase also involves setting up the database, user interface, program installation, and the overall use of the program.



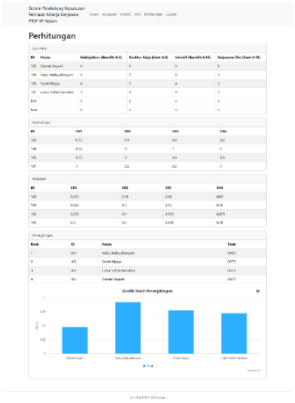
Picture 2. Login Page



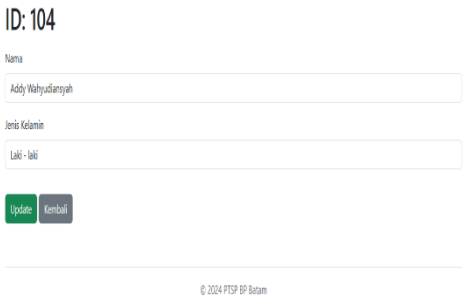
Picture 3. Register Page



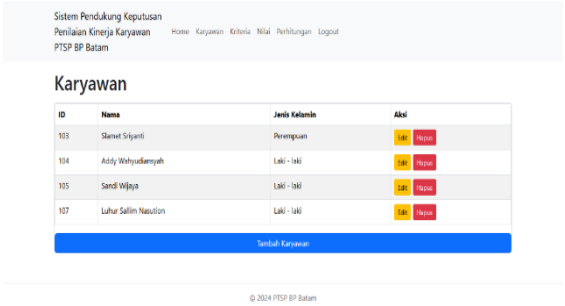
Picture 4. Home Page



Picture 5. Calculation Page

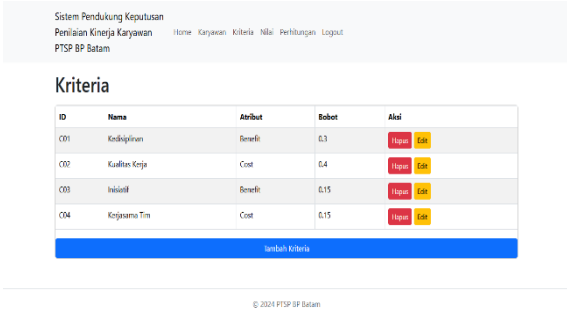


Picture 6. Employees Edit Page

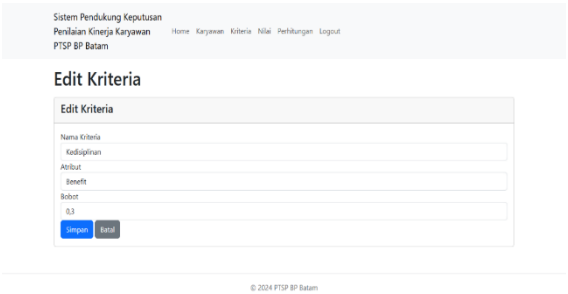


Picture 7. Employees Data Page

Picture 8. Employees Input Page

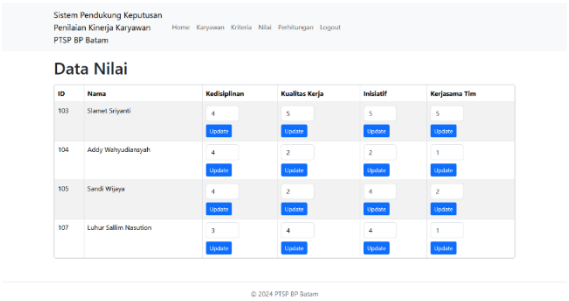


Picture 9. Criteria Page



Picture 10. Criteria Edit Page

Picture 11. Criteria Input Page



Picture 12. Value Page

CONCLUSION

With the development of the Web-Based Decision Support System for Employee Performance Assessment at PTSP BP Batam using the SAW method, it becomes easier for the admin to manage employee data, add criteria, input employee scores, and calculate performance evaluations more quickly and accurately. The object-oriented system design using UML (Unified Modeling Language) can produce a high-quality information system that is easier to understand by others in terms of design structure and programming. In this information system design, the PTSP BP Batam admin can quickly obtain the employee performance evaluations they have created.

SUGGESTIONS

To improve the development of the Web-Based Decision Support System for Employee Performance Assessment at PTSP BP Batam, several suggestions are recommended. First, training should be provided for users and administrators to ensure they understand how to properly use the system, while also designating someone responsible for maintaining the system's security. This will ensure the system is used effectively. Second, regular data backups should be conducted to safeguard data from any unforeseen circumstances. Lastly, data entry accuracy should be prioritized, and operators should be trained to improve their accuracy when inputting data. By doing so, the chances of errors will decrease, and the system's output will meet expectations.

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