Implementation of the MFEP Process Evaluation Multifactor Method in the Decision Support System for Promotion

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ABTRACT

Human Resources plays a strategic role in creating an organization's competitive advantage. At PT. Haleyora Power, the current promotion process is conducted through direct assessment by supervisors, where candidates with the highest scores based on certain criteria are selected. However, calculations and data input are still done manually using Microsoft Excel, so it is not optimal. This study proposes the implementation of a Decision Support System (DSS) with the Multifactor Evaluation Process (MFEP) method to automate and improve the accuracy of the selection process. The MFEP method is able to process various assessment factors comprehensively. The results of system testing on 20 prospective candidates showed a calculation accuracy rate of 100%, proving the reliability of this method in producing objective candidate rankings. Thus, this system can be a solution to standardize the promotion process, reduce subjectivity, and provide a more transparent and accurate basis for decision-making for PT. Haleyora Power. The implementation of this DSS is expected to optimize human resource potential and support the effectiveness of career management within the company. method, based on existing data at PT. Haleyora Power. Therefore, this study can serve as a reference for making informed decisions regarding employee promotions at PT. Haleyora Power.

Keywords: *Multi Factor Evaluation Process*, *Visual Basic*, DSS

ABSTRAK

Sumber Daya Manusia memegang peran strategis dalam menciptakan keunggulan kompetitif suatu organisasi. Di PT. Haleyora Power, proses kenaikan jabatan saat ini dilakukan dengan penilaian langsung oleh pengawas, dimana kandidat dengan nilai tertinggi berdasarkan kriteria tertentu akan dipilih. Namun, perhitungan dan penginputan data masih dilakukan secara manual menggunakan Microsoft Excel, sehingga belum optimal. Penelitian ini mengusulkan penerapan Sistem Pendukung Keputusan (SPK) dengan metode Multifactor Evaluation Process (MFEP) untuk mengotomasi dan meningkatkan akurasi proses seleksi. Metode MFEP mampu mengolah berbagai faktor penilaian secara komprehensif. Hasil pengujian sistem terhadap 20 calon kandidat menunjukkan tingkat akurasi perhitungan sebesar 100%, membuktikan kehandalan metode ini dalam menghasilkan peringkat kandidat yang objektif. Dengan demikian, sistem ini dapat menjadi solusi untuk menstandarisasi proses kenaikan jabatan, mengurangi subjektivitas, dan menyediakan dasar pengambilan keputusan yang lebih transparan dan akurat bagi PT. Haleyora Power. Implementasi SPK ini diharapkan dapat mengoptimalkan potensi SDM dan mendukung efektivitas manajemen karir dalam perusahaan.

Kata Kunci: *Multi Factor Evaluation Process*, Visual Basic, SPK

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INTRODUCTION

The development of information technology is currently experiencing very rapid progress, especially in the field of computers, which plays an important role in supporting the progress of companies. Almost all business fields have utilized computer technology in carrying out their operational activities, including online shopping service providers and the implementation of Decision Support Systems (SPK), which are used to help the decision-making process, such as selecting the best stocks (Gusrianty et al., 2019; Case & Beyf, 2020; Mahdiania & Hasibuan, 2024; Risanty et al., 2016; Sunardi & Wismarini, 2015). In addition to the use of technology, Human Resources is a very important factor in achieving the company's goals, so a system is needed that can help make decisions objectively and accurately, especially in the selection process for employee promotions at PT. Haleyora Power to run more effectively and efficiently.

Based on this description, the formulation of the problem in this study is: (1) how to design a decision support system for employee promotion at PT. Haleyora Power, (2) how to design a system in the selection process for employee promotions at PT. Haleyora Power, and (3) how to build a system for selecting employee promotions at PT. Haleyora Power to be more effective and efficient.

Hypothesis

Based on the formulation of the above problem, the following hypotheses can be made:

By using the MFEP (Multifactor Evaluation Process) method in the information system of PT. Haleyora Power is expected to be able to make accurate decisions in determining employees who will be promoted. By using the Visual Basic 2010 programming language and MySQL Database at PT. Haleyora Power is expected to make it easier to select employee promotions. It is hoped that by implementing the decision support system that will be built, it can be more effective and efficient in the selection of employee promotions at PT. Haleyora Power.

THEORETICAL FOUNDATION

Definition of Decision Support System

A decision support system is an information system at the management level of an organization that combines data to support semi-structured and unstructured decision-making (Mahdiania & Hasibuan, 2024), (Agustina, 2019; Gusrianty et al., 2019; Case & Beyf, 2020; Mahdiania & Hasibuan, 2024; Nusantara, 2020).

Characteristics of Decision Support Systems

There are several characteristics of a decision support system, namely: Interactive can be accessed interactively and quickly access data and obtain the information needed. Flexible Decision Support System (SPK) has as many variables as possible, the ability to process and provide outputs that present alternative decisions to the user (Putra et al., 2024) . The Quality Data Decision Support System (SPK) can receive quantified quality data that is subjective from the user as input data for data processing. For example, the assessment of beauty that is of a qualitative nature can be quantified by giving weight to a value such as 70 or 90 (Mahdiania & Hasibuan, 2024). The Decision Support System Expert Procedure (SPK) contains a procedure that is designed based on formal formulations, or also several procedures of expertise of a person or group in solving a problem area with a certain phenomenon.

RESEARCH METHODOLOGY

Research Framework

In order to get the results as expected in conducting research, a research framework is needed, where the research framework carried out can be described as Figure 1. Next:
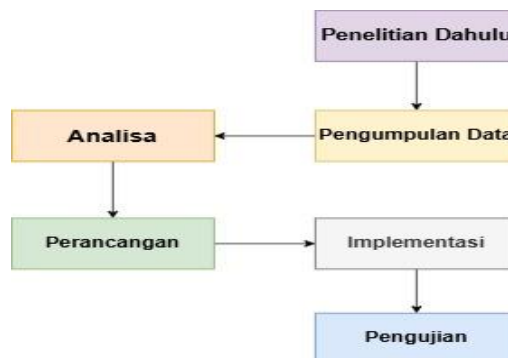

Image 1. Frame of Mind

ANALYSIS AND RESULTS

System analysis is to understand, observe, divide, and identify the weaknesses and advantages of the current system, and then propose the development of the system to be able to maintain the advantages of the system and minimize or even eliminate the weaknesses of the old system in order to form a perfect system.

Running System Analysis

The running system flow is a visual representation that describes the process of transforming data from the source, through various stages of

processing, until finally producing an output in the form of a report. This diagram clearly maps the origin of the data, how the data is processed, and to whom the results are ultimately distributed. By providing a comprehensive overview of the mechanisms of the existing system, this documentation becomes an important foundation for the analysis stage. It allows analysts to pinpoint areas that need improvement, inefficiencies in processes, as well as gaps that can be optimized in the development of new systems, so that solution design becomes more targeted and effective.

New System Analysis

To overcome existing problems, it is necessary to design a new system that defines functional needs. This system is built to simplify and speed up the data processing process. The design is presented in a comprehensive, logical and physical form. Through the implementation of this new system, it is hoped that all shortcomings in the old system can be corrected so that the efficiency and effectiveness of the process can be achieved optimally.

UML

UML (Unified Modeling Language) is a visual modeling language that has become a global industry standard for the development of software systems, especially object-oriented ones. Its function is as a fundamental tool in the process of analyzing and designing the system. UML is used comprehensively to define system requirements, perform analysis and design, and document the logical and physical architecture of the system to be built. Through a series of diagrams, such as use cases, class diagrams, and sequence diagrams, UML provides standardized graphical notation for visualizing, specifying, building, and documenting software system artifacts, thus facilitating effective communication between developers, business analysts, and stakeholders. (Andrianof, 2018).

Use Case

The use case diagram serves to visualize the features that can be accessed by admins as well as the interaction between admins and the system. This diagram also serves as a verification tool to ensure that all pre-established functional requirements have been implemented into the system correctly. Overall, the use case model describes the behavior of the system and its functional needs in running business processes, as well as being a guide in system development and testing. (Alfarizi et al., 2020) . The use case diagram for this system can be seen in Figure 2.

Image 2. Use Case

Class Diagram

A class diagram displays the existence or existence of classes and relationships in the logical design of a system. A class is a specification that, if formalized, will produce an object and is at the core of object-oriented development and design (Rad, 2020).

The following is a class diagram of the system to be built, which can be seen in Figure 3 below.
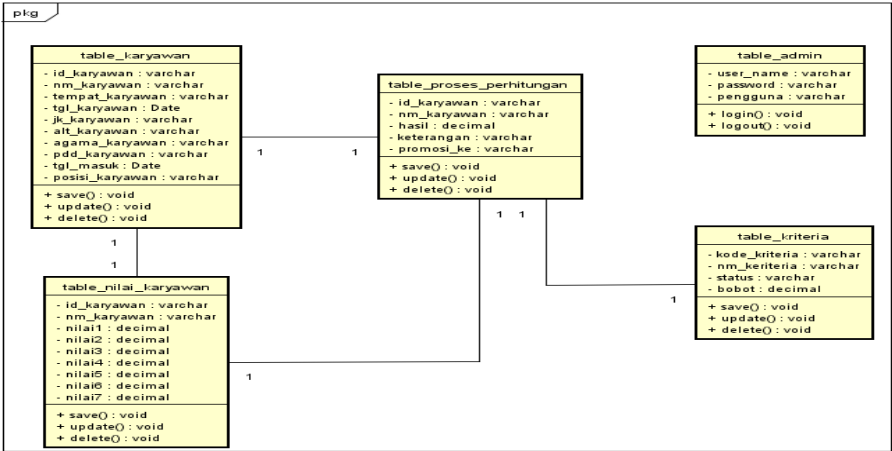

Image 3. Class Diagram

Activity Diagram

Activity diagrams describe the various flows of activity in the system being designed, how each flow starts, the decisions that may occur, and how they end. Activity diagrams can also depict parallel processes that occur on multiple executions. Activity diagrams describe the processes and activity paths from the top level in general. Activity diagrams describe the

activities that the system performs, not what the actors do. The activity diagram of this system can be seen in the following Figure 4:
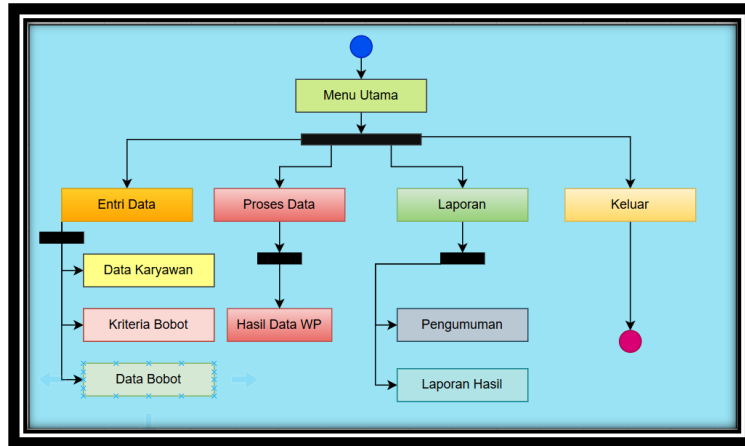

Image 4. *Activity* **Diagram**

System Implementation and Testing
System Implementation

The implementation of the system is carried out to find out how the application that has been built can be implemented into a system, as well as whether this application can benefit the user (National, 2024). Implementation is also carried out to find out the limitations of the system that has been designed and is needed to run this application.

Login

Inside the login, there is a username and password menu. For more details, you can see the following figure 5:

Image 5. Login

Main Menu

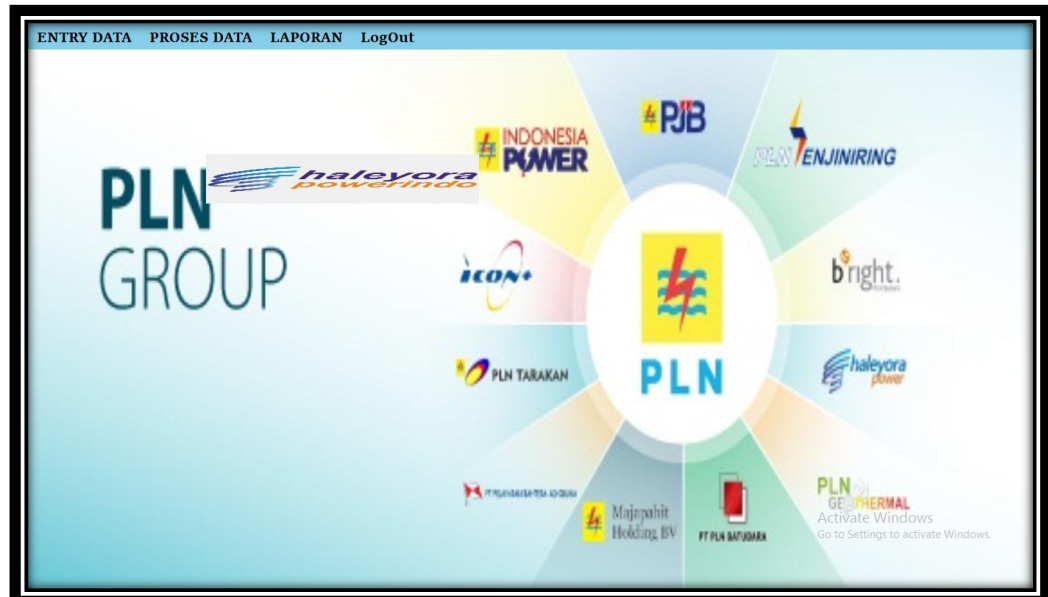In the main admin menu there is an entry menu. For more details, see the following Figure 6:

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Image 6. Main Menu Page

Employee Data Input Page

On this page employee data information can be viewed, added and edited or deleted. For more details, you can see the following figure 7:

Image 7. Employee Data Input Page

Criteria Data Input Page

On this page, leaders can input criteria that suit their needs. For more details, you can see the following figure 8:

Image 8. Criteria Data Input Page

Employee Value Input Page

On this page, leaders can rate each employee. For more details, see Figure 9. Next:

Image 9. Employee Value Input Page

Calculation Process Page

On this page, the admin performs the calculation process for each employee from the value that has been given by the leader on the employee value input form. For more details, you can see the following 10 figures:

Image 10. Calculation Process Page

CONCLUSION

Based on the description and discussion in the previous chapters, it can be concluded that the application of the Multifactor Evaluation Process (MFEP) method in the built system is able to help and facilitate PT. Haleyora Power in the process of selecting employee promotions in a more objective manner, while data storage and system design in the form of databases can reduce the need for storage space and overcome the problem of redundancy and data inconsistencies so that data management becomes more organized, as well as the use of the VB.Net 2010 programming language which is simple, resilient, object-oriented, and safe is considered appropriate to support the development of the selection system promotion of employee positions at PT. Haleyora Power

REFERENCES

Agustina, M. (2019). *IMPLEMENTASI METODE MULTI FACTOR EVALUATION PROCESS (MFEP) DALAM MEMBUAT KEPUTUSAN UNTUK MEMILIH ASURANSI KESEHATAN*. 21(2), 108–117.

Alfarizi, S., Mulyawan, A. R., Gunawan, D., Aryanti, R., Teknik, F., Bina, U., & Informatika, S. (2020). *IMPLEMENTASI UNIFIED MODELLING*

LANGUAGE PADA SISTEM INFORMASI NASGOR DELIVERY BERBASIS WEB. *15*(2).

Andrianof, H. (2018). *RANCANG BANGUN SISTEM INFORMASI PROMOSI. 5*(1), 11–19.

Gusrianty, G., Oktarina, D., & Kurniawan, W. J. (2019). *SISTEM PENDUKUNG KEPUTUSAN DENGAN METODE PROMETHEE UNTUK. November.* https://doi.org/10.32520/stmsi.v8i1.419.g166

Hidayat, R. (n.d.). *Rancang bangun sistem informasi logistik*. 707–724.

Kasus, S., & Beyf, P. T. (2020). *Sistem Pendukung Keputusan Kenaikan Jabatan menggunakan Metode Profile Matching*. 2(2), 69–77.

Mahdiania, D., & Hasibuan, M. S. (2024). *Penerapan Sistem Pendukung Keputusan d alam Memilih Supplier Menggunakan Metode Analytical Hierarchy Process (AHP). 7*(1). https://doi.org/10.32493/jtsi.v7i1.39286

Nasien, D. (2024). *Implementasi Multi Objective Optimization By Ratio Analysis Untuk Pemilihan Jenis Pupuk Kualitas Terbaik. 6*(1), 23–27.

Nusantara, U. G. (2020). *SISTEM PENDUKUNG KEPUTUSAN KENAIKAN JABATAN MENGGUNAKAN METODE PROFILE MATCHING (Studi Kasus PT . Beyf Bersaudara) P-ISSN : 2089-676X. 9*(2).

Putra, S. S., Syahril, M., & Anwar, B. (2024). *Jurnal Teknologi Sistem Informasi dan Sistem Komputer TGD Algoritma FP-Growth Menganalisa Pola Penjualan Pupuk dan Obat- obatan Pertanian UD Tenaga Tani Aceh Tenggara Jurnal Teknologi Sistem Informasi dan Sistem Komputer TGD. 7*, 184–195.

Rad, A. D. (2020). *ANALISA METODOLOGI PENGEMBANGAN SISTEM DENGAN PERBANDINGAN MODEL PERANGKAT LUNAK SISTEM INFORMASI KEPEGAWAIAN. June.*

Risanty, R. D., Meilina, P., & Hasni, N. A. (2016). Perancangan sistem pendukung keputusan prediksi jumlah produksi dan tenaga kerja menggunakan metode. *Perancangan Sistem Pendukung Keputusan Prediksi Jumlah Produksi Dan Tenaga Kerja Menggunakan Metode Fuzzy Sugeno*, *November*, 1–6.

Sunardi & Wismarini. (2015). Penggunaan Metode Fuzzy Takagi-Sugeno Di Arduino Uno Untuk Pengendali Pintu Dan Pompa Air. *Jurnal Dinamika Informatika*, *7*(1), 43–51.