New Employee Selection System using WP and SAW Methods Based on Web at PT Lanang Agro Bersatu

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Abstract

Employees are valuable assets for a company, requiring careful selection based on educational background and experience to ensure proper placement and avoid issues. At PT Lanang Agro Bersatu, the selection process involves approximately 30 candidates monthly. This study developed a web-based employee selection system using the Weighted Product (WP) and Simple Additive Weighting (SAW) methods. The system aims to calculate weight values for criteria such as Education, Work Experience, Age, Health, GPA, Academic Tests, and Psychological Tests, providing accurate rankings to simplify decision-making. The top candidate, Khusnul Wasillah, achieved the highest preference value of 0.1563, calculated through combined SAW and WP methods. System testing using black box and equivalence partitioning methods showed 100% accuracy.

Keywords: *New Employee Selection, Decision Support System, Weighted Product, Simple Additive Weighting*

1. Introduction

Employees are valuable assets for a company and must be strictly selected based on their educational background and experience to ensure proper placement. Incorrect employee selection can cause issues for the company. Until now, the assessment of prospective employees during recruitment has not been optimized. The entire assessment process is still done manually, and to show the results, all values must be summed up. In addition to the lengthy process, the results are not optimal due to difficulties in determining the criteria desired by the company, and the evaluation results are based on test score calculations [1].

PT Lanang Agro Bersatu is an agribusiness company located in Ketapang Regency, Sandai District. To become a leading company in the oil palm plantation sector, the company needs to develop a professional management team with high integrity. The new employee selection process at PT Lanang Agro Bersatu is carried out monthly with approximately 30 candidate data, highlighting the need for a system that can simplify the HRD's work.

To address the issues mentioned, a solution is offered by creating a Decision Support System (DSS), a specific information system designed to help management in making decisions related to semi-structured problems [2]. Related research by Alex Rikki, Murni Marbun, and Jonson R. Siregar, with the title "Decision Support System for Employee Recruitment Using SAW and WP Methods at PT Karya Sahata Medan," showed that employee selection was still done manually, which consumes a lot of time and has low accuracy. Therefore, a computerized system is needed to simplify the employee selection process based on predetermined criteria [3], [4].

This research is titled "New Employee Selection System Using WP and SAW Methods Based on Web at PT Lanang Agro Bersatu," which develops a DSS using the Simple Additive Weighting (SAW) and Weighted Product (WP) methods. The WP and SAW methods have advantages, such as incorporating cost and benefit variables. The calculation time is very fast due to the inclusion of cost and benefit variables, and the criteria weights have been predetermined. Therefore, the WP and SAW methods are considered suitable for solving the issues faced by PT Lanang Agro Bersatu in Ketapang Regency, Sandai District [4], [5], [6], [7].

2. Research Method

In this study, the author applied several methods to address the problem. The research methods used are illustrated in Figure 1.
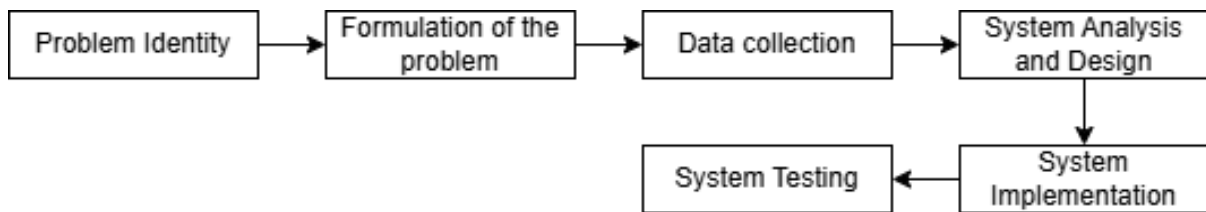
Fig. 1: Research methods

2.1. Identification of problems

Problem identification begins with clarifying and quantifying the issue. The researcher surveys and interviews PT Lanang Agro Bersatu employees about the new employee selection system, supported by a literature review and references.

2.2. Formulation of the problem

The issue lies in the subjective decision-making process for new employee selection due to the lack of proper standard procedures. To address this, the proposed solution is a web-based decision support system using the WP and SAW methods, aiming for maximum accuracy and objectivity**.**

2.3. Data Collection

Data collection is carried out to obtain the required informationin order to achieve research objectives. The data collection methods are:carried out in this research were Interviews, Observations, Literature Study

2.4. System Implementation

The researcher develops the application based on the design, implementing the Simple Additive Weighting (SAW) and Weighted Product (WP) methods. The system uses an Apache web server, MySQL database, and XAMPP for server and database management. PHP is chosen for web-based development, while the Laravel framework is selected for its open-source nature and adherence to the Model-View-Controller (MVC) concept.

3. Result and discussion

The implementation applies a combination of SAW and WP methods to develop a web-based decision support system for new employee selection. The application features admin and user interfaces. Below is a description of the system interface.

3.1. System Implementation

The system design was implemented using HTML, CSS, PHP, JavaScript, MySQL as the database, and Laravel as the web framework. The implementation includes both admin and user interfaces.

3.2. Analysis of Results

Results of the new employee selection decision support system application with SAW and WP methods can be seen in Table 1

Table 1: Employee Selection Ranking Results

No	Calon Karyawan	Skor/Nilai Preferensi
1	**Deri Hartono**	0.1563
2	**Hendri**	0.1446
3	**Erdius Wiyanto**	0.1338
4	**M.Adam Saufi**	0.1292
5	**Evan Susilo**	0.1277
6	**Ardianus Aman**	0.1081
7	**Andre Firnando**	0.1019
8	**Niko Septiana**	0.0983

The decision support system using SAW and WP methods Table 1 concludes that the best alternative is Deri Hartono with a preference score of 0.1563.

3.3. Calculation of Alternative Values for SAW and WP

The calculation of alternative values using SAW and WP includes criteria normalization (SAW), weight adjustment (WP), calculating alternative S values (WP), and determining V values for each alternative

1. Find the S value using the WP method

The S value referred to is the alternative preference value. The results of the S value can be seen in Table 2 below

Tabel 2: Alternative Preference Value Results

Nomor Preferensi Alternatif	Nilai Preferensi Alternatif
S1	0.6751389
S2	0.716782207
S3	1.036365355
S4	0.887180179
S5	0.846629912
S6	0.958625953
S7	0.856495914
S8	0.651448735

2. Find the V value using the WP method

The V value, as relative preference, indicates the importance of criteria and how well each alternative meets them. From Table 3, alternative V3 has the highest value of 0.156.

Tabel 3: Hasil Nilai Preferensi Relatif

Nomor Preferensi Relatif	Nilai Preferensi Relatif
V1	0.102
V2	0.108
V3	0.156
V4	0.134
V5	0.128
V6	0.145
V7	0.129
V8	0.098

3.4. System Testing

The following is a test of the System Accuracy Level can be seen from table 4

Tabel 4: System Accuracy Level Test Results

No	Nama Alternatif	Perhitungan Manual	Perhitungan Sistem	Selisih Perhitungan	Tingkat Kesalahan Perhitungan(%)	Akurasi Perhitungan Sistem(%)
1.	Deri Hartanto	0.1563	0.1563	0	0%	**100%**
2.	Hendri	0.1446	0.1446	0	0%	**100%**
3.	Erdius Wiyanto	0.1338	0.1338	0	0%	**100%**
4.	M.Adam Saufi	0.1292	0.1292	0	0%	**100%**
5.	Evan Susilo	0.1277	0.1277	0	0%	**100%**
6.	Ardianus Aman	0.1081	0.1081	0	0%	**100%**
7.	Andre Firnando	0.1019	0.1019	0	0%	**100%**
8.	**Niko Septiana**	**0.0983**	**0.0983**	**0**	**0%**	**100%**

4. Conclusion

Based on the research on the development of the Decision Support System for New Employee Selection using the SAW and WP methods at PT Lanang Agro Bersatu, the system was designed using a combination of the Simple Additive Weighting (SAW) method for normalizing sub-criteria weights and the Weighted Product (WP) method for adjusting criteria weights and calculating alternative preference values (s and v). Employee selection is conducted based on the ranking of v values, where the alternative with the highest value is Deri Hartanto (v = 0.1563), calculated based on the given criteria and sub-criteria. System testing using black box and equivalence partitioning methods showed 100% accuracy, as presented in Table 4.

5. Advice

Based on the conclusions above, there are several suggestions for further development of this thesis research:
1. Develop a system by adding alternatives, criteria and sub-criteria, so that the system can consider various alternative aspects or characteristics in supporting decisions for selecting new employees
2. Applying a machine learning algorithm to classify employees who are worthy of being accepted and who are not in this decision support system application can increase the reliability and accuracy of the decision support system for users

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