

# Implementation of Multi-Criteria Decision Making in PPPK Recruitment at the Department of Public Works, Spatial Planning, Housing, Settlement Areas, and Land Affairs of Riau Province

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## ABSTRACT

The recruitment process of Government Employees with Work Agreements (PPPK) at the Department of Public Works, Spatial Planning, Housing, Settlement Areas, and Land Affairs of Riau Province requires an objective and transparent evaluation system. This study aims to implement the Multi-Criteria Decision Making (MCDM) method as a decision support system to determine the most suitable PPPK candidates. The assessment is conducted based on several criteria, including educational qualifications, competencies, work experience, and selection results. Each criterion is assigned a weight according to its level of importance to produce an objective ranking of candidates. The results show that the MCDM method can support decision-makers in the PPPK recruitment process in a systematic, consistent, and accountable manner.

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## 1. Introduction

The recruitment of Government Employees with Work Agreements (Pegawai Pemerintah dengan Perjanjian Kerja, PPPK) has become one of the Indonesian government's strategic efforts to improve the quality of human resources in the public sector. PPPK recruitment is intended to help government institutions meet staffing needs while ensuring that personnel selection is conducted in a more structured, competency-based, and accountable manner. Within the framework of the State Civil Apparatus (Aparatur Sipil Negara, ASN), PPPK management is closely related to the implementation of the merit system, which emphasizes qualifications, competence, fairness, and performance in the staffing process rather than discretionary appointment practices (Juliani, 2019; Pemerintah Republik Indonesia, 2018; Republik Indonesia, 2023).

This policy is especially important for strategic regional institutions such as the Department of Public Works, Spatial Planning, Housing, Settlement Areas, and Land Affairs of Riau Province. This institution is responsible for critical functions related to infrastructure development, land management, housing, and spatial planning, all of which require highly qualified and competent personnel. Therefore, the recruitment process must be able to identify candidates who are not only academically qualified, but also technically capable and administratively suitable for the agency's operational needs. In this context, the quality of employee recruitment directly affects the effectiveness of public service

delivery and the achievement of regional development goals (Republik Indonesia, 2023; Arianto et al., 2025).

Employee recruitment in the public sector is a complex decision-making activity because it involves multiple criteria that must be evaluated simultaneously. In PPPK recruitment, decision makers often need to consider educational background, work experience, technical skills, administrative completeness, age, certification, and other professional qualifications. When many candidates possess similar profiles, the selection process can become difficult and may be influenced by subjective judgment if it is not supported by a systematic evaluation model. This problem has also been highlighted in the literature on recruitment and personnel selection, where the need for transparent and rational methods is strongly emphasized (Briscilla et al., 2024; Ziemba, 2023; Mahendra & Nugraha, 2020).

To address this issue, the implementation of a Decision Support System (DSS) using Multi-Criteria Decision Making (MCDM) methods offers a practical solution. MCDM is designed to solve problems involving several decision criteria and multiple alternatives, making it highly suitable for recruitment and selection processes. Through this approach, each criterion can be assigned a weight according to its importance, and each candidate can be evaluated more objectively based on measurable values. The final decision is then derived from a structured computational process, which reduces subjectivity and improves transparency (Pinto-DelaCadena et al., 2024; Ziemba, 2023; Briscilla et al., 2024).

Among the various MCDM methods, the Simple Additive Weighting (SAW) method is one of the most widely used due to its simplicity, flexibility, and ease of implementation. SAW works by normalizing alternative values for each criterion and multiplying them by their respective weights, resulting in a final preference score that can be used to rank the candidates. Previous studies have shown that SAW is effective in various decision-support contexts, including selection systems, recommendation systems, and comparative evaluations involving multiple alternatives (Mahendra & Nugraha, 2020; Nurilmiyanti Wardhani, 2017). Its ability to transform qualitative and quantitative criteria into a unified ranking makes SAW particularly useful in employee recruitment settings where decision makers need clear and rational outcomes.

In addition, the use of a computerized decision support system aligns with the broader trend of digital transformation in organizational management and public administration. Information systems are increasingly used not only for operational efficiency but also for improving accountability, consistency, and fairness in institutional decision making. In the context of recruitment, a DSS can support decision makers by presenting evaluation results in a more systematic manner and by minimizing the influence of personal bias or favoritism. This is particularly important in public institutions, where recruitment decisions must demonstrate transparency and fairness as part of good governance practices (Rizki, 2022; Nurjaman et al., 2024; Riadi et al., 2020).

Based on these considerations, this study proposes the implementation of a Decision Support System using the Simple Additive Weighting method for PPPK recruitment at the Department of Public Works, Spatial Planning, Housing, Settlement Areas, and Land Affairs of Riau Province. The study is intended to provide a more structured, objective, and transparent approach to evaluating prospective PPPK candidates. By applying weighted criteria in a systematic model, this research is expected to support better recruitment decisions and contribute to the implementation of merit-based personnel management in regional government institutions (Pemerintah Republik Indonesia, 2018; Republik Indonesia, 2023; Mahendra & Nugraha, 2020).

## 2. Research Methods

This study employs a quantitative decision-support approach to analyze and support PPPK recruitment using the Simple Additive Weighting (SAW) method. The research is intended to generate

a structured model for evaluating candidates based on multiple criteria relevant to the staffing needs of the Department of Public Works, Spatial Planning, Housing, Settlement Areas, and Land Affairs of Riau Province. The choice of this method is based on the fact that employee recruitment is a multi-criteria problem that requires systematic assessment and rational ranking of alternatives (Brisquilla et al., 2024; Pinto-DelaCadena et al., 2024).

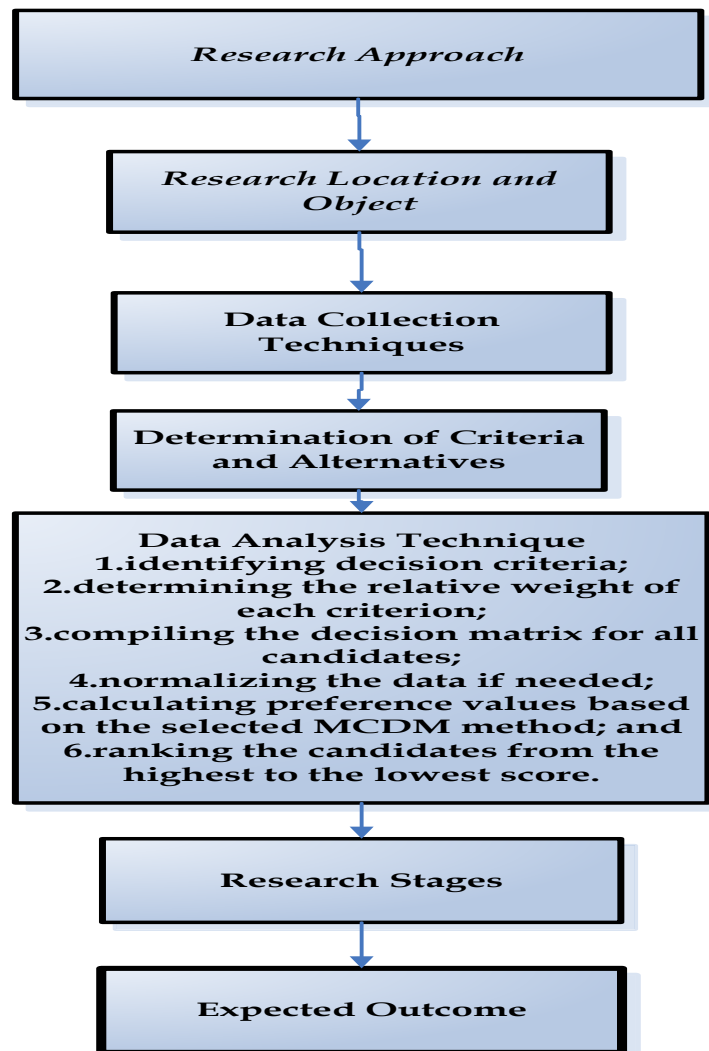


Figure 1. Research Methods

This study uses a **quantitative decision-support approach** with the implementation of **Multi-Criteria Decision Making (MCDM)** in the recruitment of Government Employees with Work Agreements (PPPK) at the Department of Public Works, Spatial Planning, Housing, Settlement Areas, and Land Affairs of Riau Province. The method is intended to support a recruitment process that is more systematic, objective, and transparent, in line with Indonesia's merit-based civil service framework. PPPK recruitment is part of the broader ASN management system and is regulated under Government Regulation No. 49 of 2018 and Law No. 20 of 2023, both of which emphasize competency-based and accountable personnel management.

## 2.1. Research Approach

The research applies a **Decision Support System (DSS)** approach by integrating the SAW method into the candidate evaluation process. A DSS is used to assist decision makers in selecting the most suitable PPPK candidates by processing data based on predetermined criteria and criterion weights. SAW was selected because it is computationally simple, easy to interpret, and effective for ranking

alternatives according to their weighted performance values (Mahendra & Nugraha, 2020; Nurilmiyanti Wardhani, 2017).

## 2.2. Research Location and Object

The research was conducted at the **Department of Public Works, Spatial Planning, Housing, Settlement Areas, and Land Affairs of Riau Province**. The object of this study is the PPPK recruitment process, specifically the stage of evaluating prospective candidates using multiple criteria relevant to the agency's organizational and functional requirements.

## 2.3. Data Collection Techniques

The study uses both **primary** and **secondary** data. Primary data were obtained through observation, interviews, and documentation. Observation was conducted to understand the existing recruitment process. Interviews were carried out with relevant personnel or officials involved in PPPK selection to identify the criteria used in evaluating candidates. Documentation was used to collect supporting materials such as recruitment requirements, candidate profiles, agency policies, and relevant administrative records. Secondary data were obtained from regulations, books, and previous studies related to PPPK, merit systems, decision support systems, and the SAW method (Juliani, 2019; Pemerintah Republik Indonesia, 2018; Republik Indonesia, 2023).

## 2.4. Determination of Criteria and Alternatives

In this study, the **alternatives** are the PPPK applicants, while the **criteria** are the aspects used to evaluate each applicant. The criteria are determined based on the needs of the institution and the standards applied in recruitment. These criteria may include education, work experience, technical competence, age, certification, administrative completeness, and interview results. Each criterion is assigned a weight according to its relative importance in the recruitment process. Weighting is a crucial step because it determines the contribution of each criterion to the final score of each candidate (Briscilla et al., 2024; Ziemba, 2023).

## 2.5. Data Analysis Technique

The data analysis in this study uses an MCDM model to rank PPPK candidates. In general, the analysis process includes:

1. identifying decision criteria;
2. determining the relative weight of each criterion;
3. compiling the decision matrix for all candidates;
4. normalizing the data if needed;
5. calculating preference values based on the selected MCDM method; and
6. ranking the candidates from the highest to the lowest score.

The candidate with the highest final score is considered the most recommended based on the established criteria. This procedure makes the decision-making process more systematic, measurable, and transparent (Mahendra & Nugraha, 2020; Nurilmiyanti Wardhani, 2017).

## 2.6. Research Stages

The research stages in this study can be described as follows:

1. identifying the problem in the PPPK recruitment process;
2. collecting data related to recruitment needs and candidate criteria;
3. determining alternatives and assessment criteria;

4. assigning weights to each criterion;
5. processing the data using an MCDM method;
6. analyzing the ranking results; and
7. drawing conclusions and recommendations for recruitment decision making.

These stages are intended to produce a decision-support model that can help the agency identify priority candidates in a more objective and accountable manner.

## 2.7. Expected Outcome

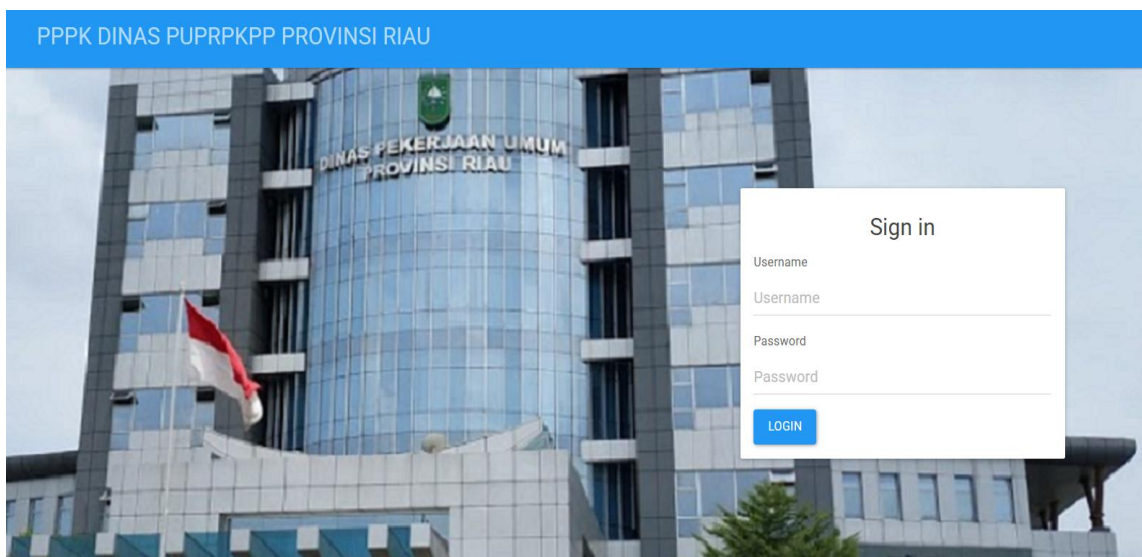
The expected outcome of this research is a decision support model that can improve the objectivity of PPPK recruitment decisions. By using SAW, the selection process can be based on measurable criteria and transparent weighted calculations, thereby reducing subjectivity and supporting the implementation of the merit system in public personnel management (Pemerintah Republik Indonesia, 2018; Republik Indonesia, 2023).

## 3. Results and Discussion

### 3.1. Implementation

The system implementation explains the procedures for processing data within the developed system. In this system, there are 10 alternative data entries of PPPK candidates that have been selected from a larger dataset obtained during research conducted at the Department of PUPRPKPP of Riau Province. This study also describes the application of the **Simple Additive Weighting (SAW)** method along with its calculation steps.

On the **Login page**, there is a form that serves as a requirement to access the main menu. Users are required to enter a registered username and password that have been stored in the database in order to operate and use the system.



**Figure 2.** Initial Display

This page represents the main menu that appears after the user successfully logs in with the correct username and password. From the home page, users can access several other pages available within the system, as shown in Figure 2 below.

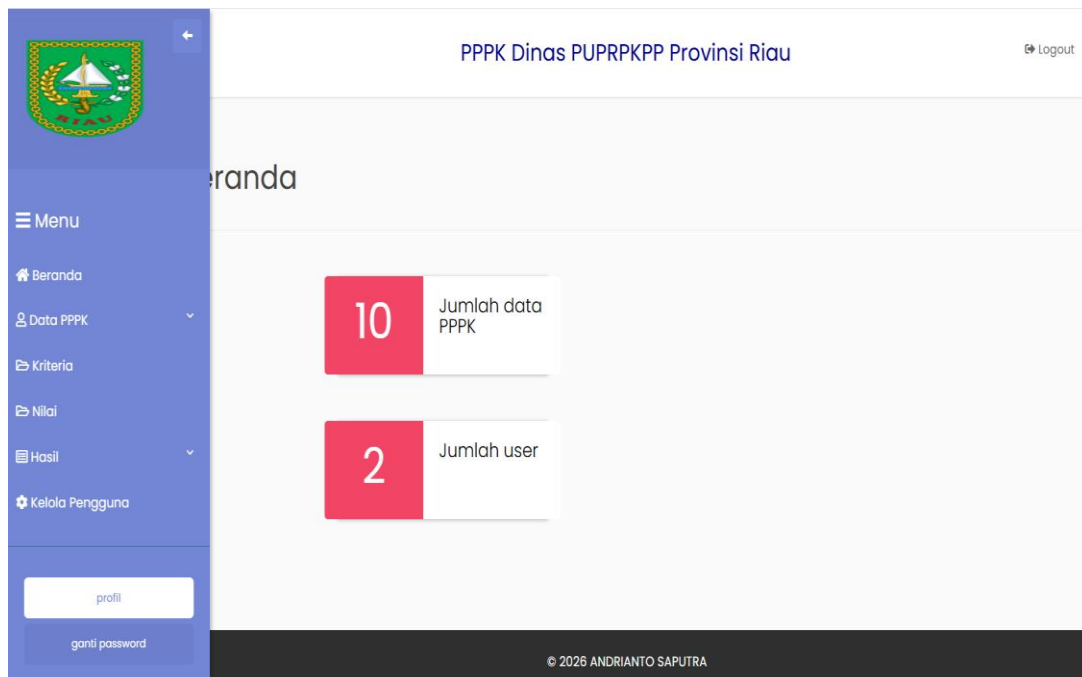


Figure 3. Dashboard Display

The **criteria input process** involves determining which criteria are used in the application and assigning a weight value to each criterion. The process of managing criteria data can be seen below.

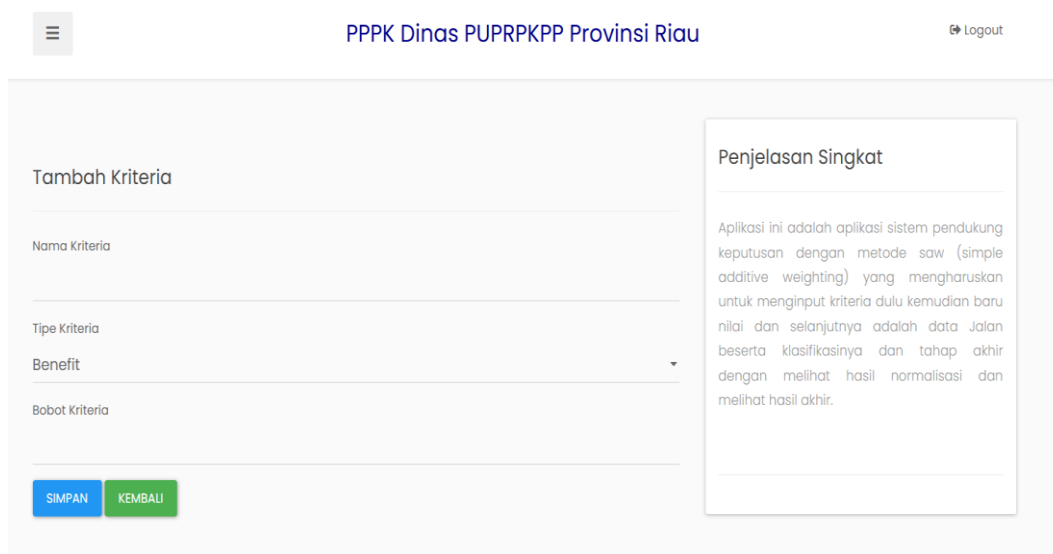


Figure 4. Criteria Input

**Normalization Process** After obtaining the decision matrix ( $X$ ), the normalization process is carried out by calculating the normalized performance rating value ( $R_{ij}$ ) of each alternative ( $A_i$ ) for each criterion ( $C_j$ ). This process is applied to all alternatives across all criteria.

Nama	Kriteria						
	Masa Kerja	Orientasi/Kepercayaan	Integritas	Komitmen	Disiplin	Kinerja	Kepuasan
ADNIN SETIAWAN	0.8	1	0.4	0.6	0.6	0.5	0.8
ARVIN SANGGAM SIRAIT	1	1	0.6	0.4	0.4	1	0.8
BASRI	0.4	0.6	1	1	0.6	1	0.4
DEBY PUTRA	0.8	0.8	0.4	0.6	1	0.75	0.8
DONDY MAROSCA	0.4	0.8	0.6	1	1	1	1
FAREL RAMADHAN	0.8	0.4	0.4	0.6	0.6	0.5	0.8
KUNTAN RACHMAYANI	1	0.8	0.8	1	0.6	0.5	0.8
M. IKBAL TAWAKAL	0.4	0.4	1	1	0.6	1	0.4
MOHD. RIZALUL HUSNI	0.6	0.6	1	1	0.6	1	0.8
NUR RANI	0.8	0.6	0.6	1	0.6	1	1

Figure 5. Final SAW Results

Based on the results shown in Figure 5 and Table 1 above, it can be observed that there is consistency between the results of manual calculations and the results generated by the system. Therefore, the accuracy between both approaches can be considered consistent, as they produce similar value tendencies.

The final decision results generated by the system, based on data provided by the Department of PUPRPKPP of Riau Province, also show consistency. The comparison can be seen in the table below:

Table 1. Comparison of Decision Results

No	Name	Agency Decision	SAW Method Decision	Final Score	Rank	Decision	Status
1	Adnin Setiawan	Not Priority	Adnin Setiawan	67	8	Not Priority	Valid
2	Arvin Sanggam Sirait	Priority	Arvin Sanggam Sirait	82	2	Priority	Valid
3	Basri	Priority	Basri	74	6	Priority	Valid
4	Deby Putra	Priority	Deby Putra	79.5	5	Priority	Valid
5	Dondy Marosca	Priority	Dondy Marosca	82	3	Priority	Valid
6	Farel Ramadhan	Not Priority	Farel Ramadhan	61	9	Not Priority	Valid
7	M. Ikbal Tawakal	Priority	M. Ikbal Tawakal	72	7	Priority	Valid
8	Mohd. Rizalul Husni	Priority	Mohd. Rizalul Husni	84	1	Priority	Valid
9	Nur Rani	Priority	Nur Rani	80	4	Priority	Valid

Based on the comparison results in Table 1, it can be concluded that the results obtained using the Simple Additive Weighting (SAW) method are consistent with the results provided by the agency.

To measure the accuracy level, the following formula is used:

$$\text{Accuracy} = (\text{Valid Data}) / (\text{Total Sample Data}) \times 100\%$$

$$\text{Accuracy} = 9 / 9 \times 100\% = 100\%$$

This result indicates that the system has a very high level of accuracy in decision making.

#### 4. Conclusions

Based on the analysis, discussion, and system development process carried out by the researcher, several conclusions can be drawn. First, the design of the decision support system (DSS) provides convenience for the Department of PUPRPKPP of Riau Province in determining which candidates should be prioritized for PPPK recruitment. Second, by applying the Simple Additive Weighting (SAW) method in the decision-making system, the results show that seven candidates are eligible to be recommended as PPPK, each having a final score above 70. Third, the implementation of this system is expected to reduce the level of nepotism in the PPPK selection process in Riau Province by providing a more objective and transparent evaluation mechanism. Furthermore, based on system testing and evaluation, it was found that the SAW method is sufficiently flexible and capable of adapting to various criteria required by users, allowing the system to accommodate different preferences such as performance, cost, or other relevant factors. Lastly, although the system has proven to be helpful in supporting decision-making, there are still opportunities for further development, such as adding more complex criteria features and integrating the system with broader online platforms to enhance its functionality and usability.

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