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Decision Support System for Selecting the Best Rental House with Weight Product in Sidokare District, Sidoarjo Regency

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ABSTRACT

The demand for rental housing in high-mobility areas such as Sidokare District, Sidoarjo Regency, continues to increase along with the region's economic development. However, prospective tenants often face difficulties in selecting the right rental house due to unstructured information and subjective decision-making processes. This study aims to develop a web-based Decision Support System (DSS) capable of providing objective and measurable rental housing recommendations. The method used is the Weighted Product (WP), a multicriteria decision-making technique that normalizes weights through multiplication operations. This system evaluates five rental housing alternatives based on eight main criteria, including price, location, facilities, security, and comfort. The results show that Sukun Rental House is the best alternative with the highest preference value of 0.0769. The practical implication of this study is the availability of an efficient digital tool for residents and students in Sidokare to compare various housing options transparently and quickly. This system successfully minimizes subjectivity in housing selection and helps users find the housing that best suits their financial priorities and functional needs.

INTRODUCTION

Rental housing, such as rented houses, is an essential need for people with high mobility, especially in areas experiencing rapid economic development such as Sidoarjo Regency. Sidokare District is one of the densely populated areas that attracts workers, students, and small families who require temporary accommodation at affordable prices. However, selecting the best rental house is not a simple process, as prospective tenants must consider various criteria such as price, location, facilities, neighborhood security, transportation access, and building condition (Hadriani, 2024)

Problems arise when information on rental alternatives is not presented in a structured manner, causing prospective tenants to face difficulties in making comparisons (Sumarto et al., 2024). The selection process becomes subjective and tends to be inefficient because it relies on manual searching and unmeasurable considerations (Hermansyah et al., 2025). This condition indicates the need for a system that can assist the community in determining the best choice objectively based on multiple criteria .

Decision Support System (DSS) is required that can process multiple criteria and generate recommendations quickly and accurately. One method commonly used in DSS to solve multi-

criteria problems is the Weighted Product (WP) method. The WP method works by multiplying the criterion values that have been raised according to their respective weights, resulting in a final preference value for each alternative (Purwanto & Ujianto, 2025). This method is suitable for rental house selection because it can accommodate differences in scale among criteria and provide relatively simple yet accurate calculation results (Oktavia et al., 2023).

In this case study, the DSS serves as an appropriate solution. Multi-Criteria Decision Making (MCDM) methods, particularly the WP method, are well suited because WP multiplies each criterion value raised to its weight to produce a final preference score (Aziz & Mufti, 2024). The WP method has been widely applied in ideal housing selection systems, including housing estates and rental houses, due to its ability to handle criteria with varying scales and to provide transparent calculations (Amelia et al., 2025). One example is a web-based housing selection DSS in Tangerang Regency that applied the WP method to generate the best housing recommendations for prospective buyers or tenants (Kurniawan et al., 2021).

The use of the WP method is highly appropriate for studies on rental house selection because it can manage criteria with different scales and provide clear and proportional preference calculations. In the study titled Web-Based Decision Support System for Selecting the Best Housing by (Imana & Riyanto, 2023), the WP method was used to calculate housing alternative scores, and the system successfully delivered logical and accurate recommendations to help prospective buyers make more informed decisions. A similar study by (Wijaya & Nerisafitra, 2025), entitled Design and Development of a Decision Support System for Determining House Locations Using the Weighted Product (WP) Method at PT Blambangan Makmur Mandiri, developed a web-based DSS using the WP method to assist users in selecting houses based on various criteria such as installment price, location, land and building area, facilities, and transportation access. This system made the housing selection process easier, more interactive, and more objective.

In addition, a study combining the Analytical Hierarchy Process (AHP) with the Weighted Product (WP) method by (Wantoro et al., 2024) demonstrates how criterion weights can be determined systematically before being processed using WP, thereby increasing objectivity in the ranking process. Similarly, the study conducted by (Ayuningtyas et al., 2025) ,entitled Implementation of the Weighted Product Method in a Restaurant Recommendation System around YIA Airport, applied WP in a web-based application and successfully produced recommendations with high accuracy (83%). The WP method was also implemented in the study by (Pratiwi et al., 2025), entitled Application of the Weighted Product (WP) Method in a Decision Support System for Mapping New Housing Selection, which explains that the use of WP enables the system to generate housing recommendations that best match user-defined criteria. The calculation results show that the WP method is able to rank each alternative proportionally according to the criterion weights, thus serving as an effective decision support instrument in the process of selecting new housing.

Previous studies have predominantly applied the WP method to general housing cases (Imana & Riyanto, 2023) or commercial recommendations such as restaurants (Ayuningtyas et al., 2025) , but have not specifically examined rental housing selection with respect to the local characteristics of a particular area. This condition indicates the existence of a research gap, particularly regarding the needs of communities in Sidokare District, which currently lack a structured information system to compare rental housing alternatives. The main strength of this study lies in the use of more comprehensive and objective evaluation criteria, as it not only focuses on the internal aspects of rental housing but also considers environmental factors surrounding the rental location. Therefore, this research contributes to the development of a web-based Decision Support System for rental housing selection using the WP method, tailored to the local context of Sidokare District. This contribution not only enriches the literature on WP implementation in the micro-scale housing sector but also provides a practical solution to enhance objectivity and efficiency in the rental house selection process for the community.

RESEARCH METHODS

This study employs the Weighted Product (WP) method as a Multi-Criteria Decision Making (MCDM) technique to determine the ranking of the best rental houses in Sidokare District. WP is a multi-criteria decision-making approach that utilizes multiplication operations in the process of normalizing the weights of each attribute (Nasyuha et al., 2025). Its calculation mechanism is based on the principle that each alternative has criterion values that are then combined with previously assigned weights (Arshad et al., 2024). This approach is considered effective in solving decision-making problems involving many variables, as it is able to produce proportional comparisons of alternatives based on both the weights and the values of each criterion (Gaol & Syahrizal, 2024). The method works by multiplying criterion values that have been raised according to their respective weights, thereby producing a final preference value for each alternative (Rezagustini et al., 2025). The following are the research steps and their implementation:

Identification of Alternatives

The study begins with the identification and collection of data on rental house alternatives in Sidokare District. For testing and system demonstration purposes, five rental house alternatives are used. These alternative data are then collected and entered into the system, including the values of each rental house based on the selected criteria. The condition of rental houses in the Sidokare area is quite diverse, ranging from simple housing with basic facilities to rental units that offer greater comfort with complete facilities, resulting in significant variations in quality among alternatives. This diversity of characteristics makes the rental house selection process increasingly challenging for prospective tenants. However, the developed system is dynamic, allowing users to input the number of alternative data according to their needs. The following is an example of alternative data at the identification stage, presented in Table 1.

Table 1. Sample Data Collection

Alterna-tive	Rental price	Location	Facilities	Neighbor-hood security	Comfort	Transporta-tion access	Environ-ment	Building-size
A1	800,000	Close to campus/ shopping centers	Wi-Fi, electronic appliances	Gated entrance, security post	Quiet, good ventilation	Accessible by ride-hailing/ public transport, near main road	Clean and good neighbors	Moderately spacious (2 bedrooms, living room, kitchen)
A2	500,000	Close to one major activity center	Bed, wardrobe, desk	Locked gate/ self-managed security	Slight noise present	Close to bus stop/ terminal	Fairly clean and average neighbors	Less spacious (1 bedroom, living room, kitchen)
A3	1,500,000	Requires a small effort to reach the destination	Air conditioning, water heater, Wi-Fi, electronic appliances	CCTV and 24-hour security guards	Quiet, clean, excellent ventilation	Requires 5–10 minutes walking to main access	Very clean and friendly/ educated neighbors	Spacious (2 bedrooms, living room, kitchen, garage)
A4	1,500,000	Far from activity centers	Space only, without basic furniture	No security, quiet area	Often noisy or poor air circulation	Accessible only by private vehicles	Less clean/ many garbage areas	Very spacious (3 bedrooms, living room, kitchen, garage)
A5	1,000,000	Remote/ requires more than 30 minutes to reach destination	Empty space only	Frequent criminal incidents	Very noisy/ stuffy/ dirty	No public transport access/ narrow roads	Slum environment and indifferent neighbors	Very small (1 bedroom, kitchen)

Criteria Determination

Criteria determination is a crucial stage in the decision-making process of the Decision Support System for selecting the best rental house in Sidokare District, Sidoarjo Regency. The criteria are established based on the factors most commonly considered by prospective tenants when choosing a rental house. Eight evaluation criteria are determined based on surveys and

literature reviews (Rifqi & Aldisa, 2023) (Siregar & Susanto, 2022) (Sumarto et al., 2024), as presented in Table 2.

Table 2. Criteria Data

Criteria	Description	Type
C1	Rental price	Cost
C2	Location	Benefit
C3	Facilities	Benefit
C4	Neighborhood security	Benefit
C5	Comfort	Benefit
C6	Transportation access	Benefit
C7	Environment (e.g., cleanliness, neighbors)	Benefit
C8	Building size	Benefit

The determination of the eight evaluation criteria in this study is based on factors that have the highest significance in the decision-making process of prospective tenants, particularly workers and students. These criteria reflect essential needs and financial priorities. The following explanation presents the underlying considerations for selecting the eight criteria in determining rental housing:

- Rental Price (C1): This represents the primary financial constraint that determines housing affordability for students and workers with limited budgets.
- Location (C2) and Transportation Access (C6): Both are key factors in time and cost efficiency. Students require locations close to campus, while workers need easy access to workplaces or public transportation services.
- Facilities (C3) and Building Size (C8): These reflect the feasibility and functionality of the housing. Workers and students often require supporting facilities for study or work, as well as adequate space for daily activities.
- Neighborhood Security (C4): This serves as a fundamental prerequisite to ensure personal safety and asset protection, especially for newcomers.
- Comfort (C5) and Environment (C7): These criteria influence quality of life and productivity. A clean, quiet environment with supportive neighbors is crucial for maintaining focus during study and for proper rest.

Criteria Weight Assignment

Each criterion is assigned a weight according to its level of priority (for example: rental price 0.20; location 0.15; and so forth). The determination of these weights can be obtained through surveys of prospective tenants or through interviews with local experts, such as rental house owners or managers. Accurate weight assignment is crucial because it directly affects the ranking results and the accuracy of the recommendations generated by the system.

Determining the values for each rental house alternative is an essential step in the WP method. To convert qualitative criteria such as location and facilities into quantitative data that can be processed by the system, this study employs a five-point Likert scale. The scale ranges from 1 (Very Poor) to 5 (Very Good), with clear and realistic qualitative descriptions for each criterion. Additional information is provided in that for the rental price criterion (Cost), a value of 5 indicates the best performance (lowest price), while for all other Benefit criteria, a value of 5 indicates the best performance (highest level).

The rental price ranges are categorized to capture the full spectrum of housing options in Sidokare, from budget-friendly rooms to premium units. These values are treated as a cost kriteria in the WP method, where lower prices are prioritized to reflect tenant preferences for affordability. Consequently, the highest weight (5) is assigned to the lowest price tier (< IDR 500,000), while the

weight decreases as the price increases to ensure a mathematically proportional comparison between an alternative's cost and its benefits. The details of the rating scale weights for the rental price criterion are presented in Table 3.

Table 3. Rating Scale Weights for Rental Price Criterion

Value	Weight
< IDR 500,000/month	5
IDR 500,000 – 800,000/month	4
IDR 800,000 – 1,000,000/month	3
IDR 1,000,000 – 1,500,000/month	2
> IDR 1,500,000/month	1

The location categories are defined based on proximity to strategic activity hubs in Sidokare, such as campuses and shopping centers. These ranges reflect the accessibility levels that directly impact a tenant's mobility and daily commute efficiency. In this model, location is treated as a benefit criterion, where higher proximity to major centers correlates with higher preference. Accordingly, the maximum weight (5) is assigned to the most strategic locations, while the weight decreases for remote areas requiring more than 30 minutes of travel. This structure ensures that the system mathematically favors alternatives that offer the best geographic convenience for the user. The details of the rating scale weights for the location criterion are presented in Table 4

Table 4. Rating Scale Weights for Location Criterion

Value	Weight
Close to campus/shopping centers	5
Close to one major activity center	4
Requires a small effort to reach the destination	3
Far from activity centers	2
Remote/requires more than 30 minutes to reach the destination	1

The facilities criterion is categorized based on the completeness of interior amenities provided by the rental units. These ranges reflect the standard of living and the immediate readiness of the house for occupancy, ranging from premium units with high-end appliances to empty spaces. In the Weighted Product method, facilities are treated as a benefit criterion, where a more comprehensive set of amenities such as Air Conditioning, water heaters, and Wi-Fi is assigned the maximum weight of 5. Conversely, the weight decreases as the level of provided furniture and electronics diminishes, with empty spaces receiving a weight of 1. This classification allows the system to prioritize alternatives that offer higher functional value and convenience for the tenants. The details of the rating scale weights for the facilities criterion are presented in Table 5.

Table 5. Rating Scale Weights for Facilities Criterion

Value	Weight
Air conditioning, water heater, Wi-Fi, electronic appliances	5
Wi-Fi, electronic appliances	4
Bed, wardrobe, desk	3
Space only, without basic furniture	2
Empty space only	1

The neighborhood security criterion is categorized based on the level of protection and safety measures provided within the rental area. These ranges are established to reflect the tenant's

need for personal and property safety, ranging from advanced security systems to high-risk environments. In the WP method, security is treated as a benefit criterion, where higher protection levels such as the presence of CCTV and 24-hour guards are assigned the maximum weight of 5. Conversely, the weight decreases as security measures become more informal or non-existent, with areas frequenting criminal incidents receiving the lowest weight of 1. This classification ensures that the system mathematically prioritizes safer living environments, which is a critical factor in the rental house selection process. The details of the rating scale weights for the neighborhood security criterion are presented in Table 6.

Table 6. Rating Scale Weights for Neighborhood Security Criterion

Value	Weight
CCTV and 24-hour security guards	5
Gated entrance, security post	4
Locked gate/self-managed security	3
No security, quiet area	2
Frequent criminal incidents	1

The comfort criterion is evaluated based on the environmental quality and physical atmosphere of the rental unit, specifically focusing on noise levels and air circulation. These ranges reflect the essential requirements for a healthy and productive living space, ranging from ideal quiet conditions to highly disruptive environments. In the WP method, comfort is treated as a benefit criterion, where a quiet, clean environment with excellent ventilation is assigned the maximum weight of 5. Conversely, the weight decreases as noise pollution increases and air quality diminishes, with very noisy or stuffy conditions receiving the lowest weight of 1. This scoring logic ensures that the system mathematically prioritizes the well-being of the tenant by favoring alternatives that offer superior living tranquility. The details of the rating scale weights for the comfort criterion are presented in Table 7.

Table 7. Rating Scale Weights for Comfort Criterion

Value	Weight
Quiet, clean, excellent ventilation	5
Quiet, good ventilation	4
Slight noise present	3
Often noisy or poor air circulation	2
Very noisy/stuffy/dirty	1

The transportation access criterion is categorized based on the ease of mobility and the availability of transport modes surrounding the rental house. These ranges reflect the practical connectivity required by tenants for daily travel, from high accessibility via public and ride-hailing services to restricted access in narrow or remote areas. Within the Weighted Product (WP) framework, transportation access is treated as a benefit criterion, where immediate proximity to main roads and public transport hubs is assigned the maximum weight of 5. Conversely, the weight decreases as the effort to reach main access points increases, with locations inaccessible by public transport receiving a weight of 1. This classification ensures the system mathematically prioritizes alternatives that minimize travel constraints for the occupants. The details of the rating scale weights for the transportation access criterion are presented in Table 8.

Table 8. Rating Scale Weights for Transportation Access Criterion

Value	Weight
Accessible by ride-hailing/public transport, near main road	5
Close to bus stop/terminal	4
Requires 5–10 minutes walking to main access	3
Accessible only by private vehicles	2
No public transport access/narrow roads	1

The environment criterion is categorized based on the physical cleanliness and social quality of the neighborhood surrounding the rental units. These ranges reflect the tenant's need for a healthy and harmonious living space, ranging from well-maintained areas with educated neighbors to slum environments with poor social interaction. In the Weighted Product (WP) framework, the environment is treated as a benefit criterion, where a very clean and friendly neighborhood is assigned the maximum weight of 5. Conversely, the weight decreases as the environmental quality declines, with slum conditions receiving a weight of 1. This scoring structure ensures the system mathematically prioritizes alternatives that offer superior social and environmental well-being for the occupants. The details of the rating scale weights for the environment criterion (e.g., cleanliness, neighbors) are presented in Table 9.

Table 9. Rating Scale Weights for Environment Criterion (e.g., cleanliness, neighbors)

Value	Weight
Very clean and friendly/educated neighbors	5
Clean and good neighbors	4
Fairly clean and average neighbors	3
Less clean/many garbage areas	2
Slum environment and indifferent neighbors	1

The building size criterion is categorized based on the total floor area and the functional rooms available within each rental unit. These ranges reflect the diverse spatial needs of tenants, from large families requiring multiple bedrooms and a garage to individuals seeking compact living spaces. Within the Weighted Product (WP) framework, building size is treated as a benefit criterion, where a very spacious unit comprising three bedrooms, a living room, a kitchen, and a garage is assigned the maximum weight of 5. Conversely, the weight decreases as the number of rooms and overall dimensions diminish, with very small units consisting of only one bedroom and a kitchen receiving a weight of 1. This classification allows the system to mathematically prioritize alternatives that offer greater spatial utility and capacity. The details of the rating scale weights for the building size criterion are presented in Table 10.

Table 10. Rating Scale Weights for Building Size Criterion

Value	Weight
Very spacious (3 bedrooms, living room, kitchen, garage)	5
Spacious (2 bedrooms, living room, kitchen, garage)	4
Moderately spacious (2 bedrooms, living room, kitchen)	3
Less spacious (1 bedroom, living room, kitchen)	2
Very small (1 bedroom, kitchen)	1

Implementasi Metode Weighted Product (WP)

- Weight Normalization

Before calculating the preferences, the weights for each criterion must be normalized so that the total of all weights equals 1 (Ertandi & Akbar, 2025). This is formulated as follows:

$$\omega_j = \frac{W_j}{\sum_{j=1}^{n} W_j} \quad (1)$$

Where W_j is the initial weight and w_j is the normalized weight.

Exponential Rule:

- If the criterion is Benefit (the greater the better), then the exponent is positive (+).
- If the criterion is Cost (the smaller the better), then the exponent is negative (-).

- Calculating the *S* Vector (Individual Preference)

The *S* value represents the performance of each rental house alternative. It is calculated by multiplying the values of all criteria, each raised to the power of its normalized weight. Positive exponents are applied to benefit-type criteria, while negative exponents are used for cost-type criteria (Mukhlis et al., 2024):

$$S_i = \prod_{j=1}^{n} X_{ij}^{w_j} \quad (2)$$

Where:

S_i = preference value for alternative *i*

X_{ij} = value of alternative *i* for criterion *j*

w_j = weight of criterion *j* (positive for benefit, negative for cost).

- Calculating the *V* Vector (Relative Preference for Ranking)

The scale or value of Vector (V) represents the priority (preference) used in the ranking process. This process is carried out by comparing each vector S value to the total sum of all vector S values in order to obtain a proportional ordering of alternatives. After obtaining $S_i$for each alternative, total normalization is performed to calculate (Ertandi & Akbar, 2025):

$$V_i = \frac{S_i}{\sum_{i=1}^{m} S_i} \quad (3)$$

Where:

V_i = Nilai akhir untuk alternatif ke-

S_i = Hasil perhitungan vektor *S* pada langkah sebelumnya

$\sum Si$ = Total seluruh nilai S dari semua alternatif

m Jumlah total alternatif yang dievaluasi dalam penelitian.

Web System Implementation

This study also designs a web-based application built using pure HTML and JavaScript. The system provides several features, including:

- Dynamic input of the number of rental house alternatives;
- Input of the number of criteria and the weight of each criterion;
- Manual input of values for each rental house on every criterion;
- Automatic calculation of weight normalization, S values, V values, and rental house rankings;
- Result display in the form of an easy-to-read rental house ranking table.

System Evaluation

The evaluation process is carried out by comparing the rankings generated by the system with manual assessment results, such as user preference surveys, to assess the accuracy and relevance of the recommendations provided.

RESULTS AND DISCUSSION

Based on the calculation results using the Weighted Product (WP) method on five rental house alternatives, the S vector and V vector values were obtained, indicating the feasibility level of each rental house according to the assigned weights and the benefit criteria used. All criteria in

this study are classified as benefit criteria; therefore, the higher the value assigned to an alternative, the greater its potential to be selected by prospective tenants.

Based on the WP method calculations applied to the five rental house alternatives input into the system, the S vector and preference vector V values were obtained, reflecting the feasibility level of each rental house. The entire calculation process takes into account eight criteria, along with their predetermined weights and the relevant cost or benefit classification. The V value represents the final score used as the basis for ranking, where the alternative with the highest V value is considered the best rental house. A summary of the calculation results and alternative rankings is presented in Table 11.

Table 11. WP Calculation Results

Rank	Rental House Name	S Value	V Value
1	Sukun	0.79998	0.0769
2	Yani	0.78694	0.0757
3	Panjaitan 2	0.78233	0.0752
4	Panjaitan	0.75721	0.0728
5	Watugunung 2	0.73424	0.0706

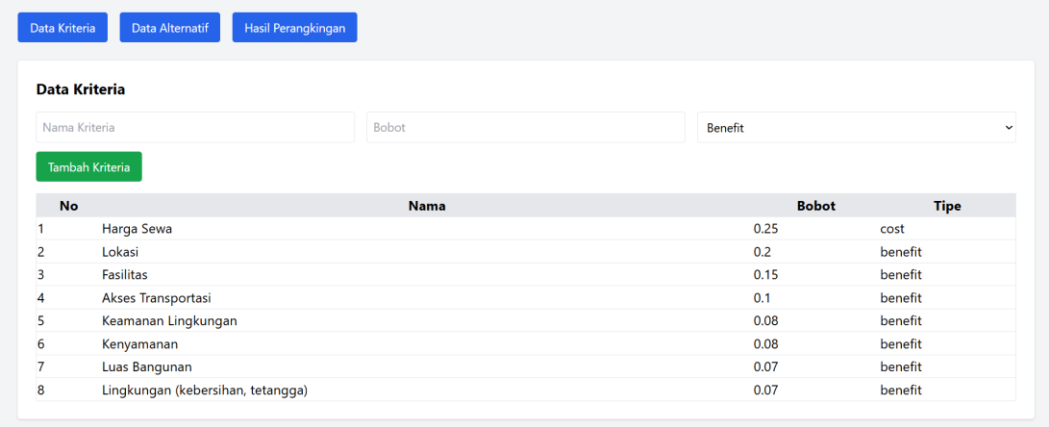
From the ranking table, it can be seen that Sukun Rental House has an S value of 0.79998 and the highest V value of 0.0769. This result indicates that Sukun Rental House is the most superior alternative compared to the other rental houses. This superiority suggests that the rental house consistently achieves high scores across most criteria, such as location, facilities, security, and comfort, resulting in a higher final preference value. Therefore, Sukun Rental House can be recommended as the best rental option based on the criteria used in this study.

The next rankings are occupied by Yani and Panjaitan 2, with V values of 0.0757 and 0.0752, respectively. The small differences among the top three alternatives indicate a high level of competition, meaning that user preferences may change if the criterion weights are adjusted according to tenant needs. Meanwhile, Panjaitan and Watugunung 2 rank fourth and fifth with lower V values. These results indicate that although both rental houses have certain advantages, their scores on some other criteria may not be optimal, leading to lower overall preference values.

The WP method has proven effective in producing ranking results that are consistent, objective, and easy to understand. This is because WP employs a multiplicative approach among criterion values raised to their respective weights, allowing it to accommodate multiple criteria with different scales. However, the WP method also has some limitations. One of them is its sensitivity to extreme values, where very small or very large values in a particular criterion can significantly affect the final results. In addition, WP heavily depends on the accuracy of the weights assigned by users; incorrect weighting may lead to suboptimal recommendations.

The implementation of the WP method in a web-based application provides significant added value. Users can flexibly input the number of alternatives and criteria, adjust weights according to personal needs, and manually enter the values for each rental house. The system then automatically performs weight normalization, calculates the S and V values, and generates the ranking results.

The initial setup (input) page allows users to define the criteria, weights, and types (Cost/Benefit) to be used by the WP algorithm to evaluate and rank the available rental house options, as illustrated in Figure 1



No	Nama	Bobot	Tipe
1	Harga Sewa	0.25	cost
2	Lokasi	0.2	benefit
3	Fasilitas	0.15	benefit
4	Akses Transportasi	0.1	benefit
5	Keamanan Lingkungan	0.08	benefit
6	Kenyamanan	0.08	benefit
7	Luas Bangunan	0.07	benefit
8	Lingkungan (kebersihan, tetangga)	0.07	benefit

Figure 1. Criteria Data System Page

The (input) page allows users to define the raw data of each rental property option and translate it into numerical values (in this case, a 1–5 scale) based on the previously defined criteria. These values are then processed by the WP method to generate the ranking results, as shown in Figure 2.

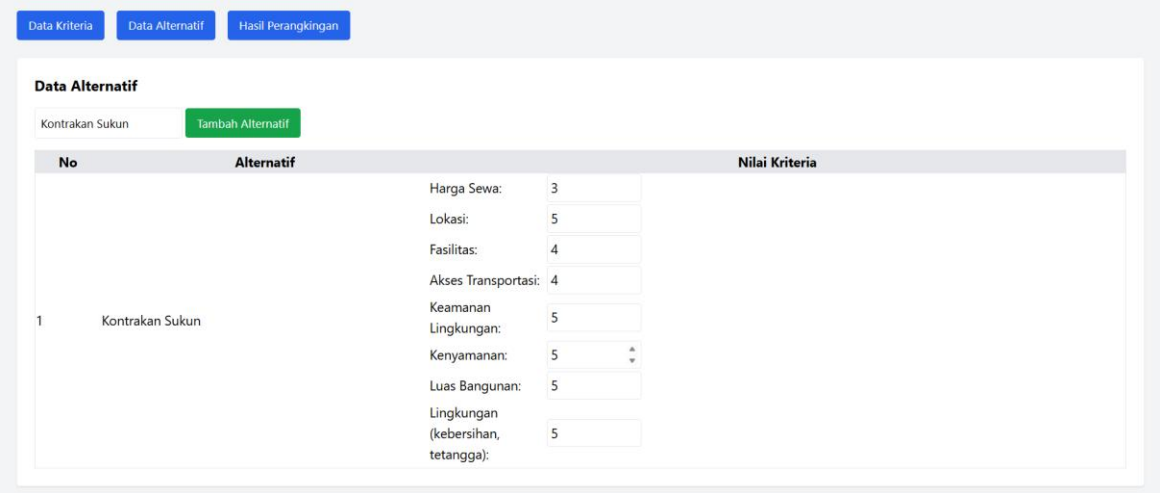


Figure 2. Alternative Data System Page

The page displays the results of the computation and ranking of rental housing alternatives based on the criteria, weights, and values that were previously entered, as shown in Figure 3.

Peringkat	Alternatif	Nilai S	Nilai V
1	Kontrakan Sukun	0,79998	0,0769
2	Kontrakan Yani	0,78694	0,0757
3	Kontrakan Panjaitan 2	0,78233	0,0752
4	Kontrakan Panjaitan	0,75721	0,0728
5	Kontrakan Watugungung 2	0,73424	0,0706

Figure 3. Ranking Results Page of the System

The presentation of the results in a well-structured table makes it easier for users to understand the decision-making process. The main advantage of this web application lies in its portability and ease of access, as it can be run directly through a web browser without requiring additional software installation. This allows anyone, including prospective tenants in Sidokare District, to simulate various rental selection scenarios according to their individual needs.

Overall, from both the computational and system implementation perspectives, the Weighted Product (WP) method is able to produce outputs that are efficient, accurate, and easy to apply as a basis for determining the most suitable rental housing. This approach also simplifies the evaluation process of alternatives and enhances consistency in assessing each criterion. Therefore, the WP method can be regarded as a reliable solution for supporting decision-making processes.

When compared with previous studies, the results of this research demonstrate the consistent performance of the Weighted Product (WP) method in generating stable recommendations, even when applied to the context of rental housing selection involving eight complex criteria. The relatively small differences in preference values among alternatives, as also found in the study by (Imana & Riyanto, 2023), indicate that WP is sensitive to changes in weights and values for each criterion, enabling it to capture small yet relevant differences in the decision-making process. Furthermore, the alignment of ranking results in this study with patterns observed in prior research (Ayuningtyas et al., 2025) shows that the WP method remains accurate even when applied across different domains, including residential housing, commercial facilities, and rental units. This reinforces the interpretation that WP is not only effective in handling differences in criterion scales but also capable of maintaining consistency in preference calculations across various types of multi-criteria decision-making cases. Consequently, the findings of this study are not only valid within the local context of Sidokare District but are also strongly supported by empirical evidence from related studies employing similar approaches.

CONCLUSION

The Weighted Product (WP)–based Decision Support System has proven to be effective in assisting the selection of the best rental housing in Sidokare District. By considering eight main criteria, the system is able to provide objective, measurable, and user-oriented recommendations that align with the needs of prospective tenants. Based on the calculation results, Sukun Rental emerged as the best alternative with the highest preference value. These findings indicate that the Weighted Product method is capable of handling differences in scale among criteria and producing consistent ranking results.

As a direction for future research, the system can be further enhanced by incorporating additional criteria such as the rental owner's history, the quality of the social environment, internet network conditions, and the level of area density. Moreover, integration with Geographic Information System (GIS) technology could enable more interactive visualization of rental locations. The system may also be expanded with features such as real-time updates from rental owners, user reviews, and the application of other MCDM methods—such as AHP, TOPSIS, or hybrid approaches—for comparative accuracy analysis. With these developments, the system is expected to deliver more comprehensive, adaptive, and responsive recommendations that better accommodate the evolving needs of users in the future.

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