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Application of Simple Additive Weighting (SAW) for Best Decor at Mainaka Decoration

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Abstract—The rapid development of the event decoration service industry requires companies to provide fast, objective, and accurate decisions in determining decoration concepts that meet client expectations. At Mainaka Decoration, the selection of decoration concepts is still conducted manually based on the designer's intuition, which often leads to subjective decisions and inefficiency in the decision-making process. This study aims to design a Decision Support System (DSS) to determine the best decoration concept using the Simple Additive Weighting (SAW) method. The research applies a quantitative approach with data collected through observation, interviews, and documentation. The system evaluates five alternatives based on five criteria: budget, aesthetics, processing time, theme suitability, and decorative material durability. The results show that the SAW method can rank decoration alternatives objectively and identify the best concept with the highest preference value of 0.76. After implementing the proposed method, the decision-making process time decreased from approximately 30–45 minutes to 10–15 minutes per client, indicating an efficiency improvement of about 60–65%. These results demonstrate that the proposed system improves decision accuracy, objectivity, and operational efficiency in selecting decoration concepts at Mainaka Decoration.

Keywords— decision support systems, simple additive weighting, decoration selection, decision making, saw methods.

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I. INTRODUCTION

The event decoration service industry is one of the sectors experiencing rapid growth in Indonesia [1]. Public demand for attractive and aesthetic decorations is increasing in line with growing trends in events such as weddings, birthdays, engagements, seminars, and product launches [2]. Decorations now serve not only as room embellishments, but also as representations of lifestyle, identity, and reflections of the client's character. One company engaged in this field is Mainaka Decoration, which provides thematic decoration services for various types of events, both indoor and outdoor. Weddings are a dream moment for every couple who goes through with them. The existence of wedding organizers, event organizers, and wedding planners is one of the reasons why every couple needs help to prepare and plan a wedding that matches their dreams.

In practice, the process of selecting a decoration concept that suits the client's wishes often poses a challenge. Many factors need to be considered, such as the theme of the event, dominant colors, location, budget, availability of materials, and the client's aesthetic

preferences. It is not uncommon for there to be a mismatch between the client's expectations and the resulting decoration because the concept selection process is carried out subjectively based solely on the designer's experience. This situation can reduce customer satisfaction and impact the company's reputation [3].

n addition, the many alternative decoration concepts offered by Mainaka Decoration make the decision-making process complex. The company usually offers various concepts such as modern minimalist, rustic, bohemian, glamorous, and traditional elegant. Each concept has its own advantages and disadvantages, as well as requiring different costs and processing times. Without a structured system to assess and compare these alternatives objectively, decision-making will tend to be subjective and inefficient.

To overcome these problems, a scientific approach is needed to help Mainaka Decoration's management offer the best decoration concepts based on the criteria desired by customers [4]. One relevant method used in this context is Simple Additive Weighting (SAW) [5] [6]. The SAW method is one of the methods in Multiple Attribute Decision Making (MADM) used to assess and determine the best alternative based on the weighting of a number of criteria [7] [8]. Each alternative will be evaluated based on the value given to each criterion [9], then the total maximum value will be calculated as the most optimal alternative [10]. The method used to solve a problem in the decision-making process for selecting a wedding organizer package is Simple Additive Weighting (SAW). The application of the SAW method in this study takes into account several advantages, including that it is user-friendly, more flexible, and can solve various complex problems and learn from human experience in solving problems.

By applying the SAW method to the Decision Support System (DSS), the process of selecting decoration concepts will become more objective, systematic, and efficient [11]. SAW-based DSS can assist management in assessing each concept based on criteria such as budget [12], aesthetics, suitability to the event theme, completion time, and customer satisfaction level [13]. The final result is a recommendation for the best decoration concept that aligns with the client's needs and the company's capabilities [14] [15].

Business process digitization not only increases service speed but also assists in data-driven decision making [16] [17]. For Mainaka Decoration, this is a strategic step towards modernizing professional and competitive decoration service management amid increasing competition in the Indonesian decoration industry [18].

II. METHODOLOGY

This study used several stages, as shown in Figure 1 below.

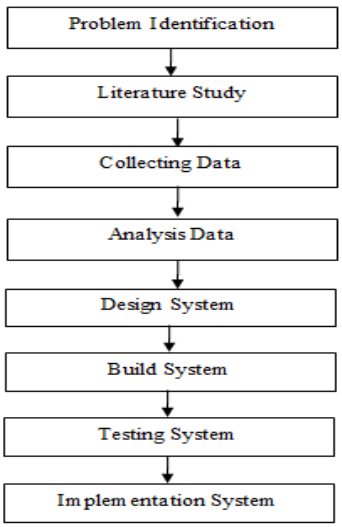

Figure 1. Research Method

A. Problem Identification

The initial stage of this research is a preliminary study aimed at obtaining input and suggestions regarding the object to be studied. In this study, researchers can obtain information about the issues raised in the research. In this study, the issue raised is that the process of selecting decoration concepts is still subjective because it depends on the experience and intuition of designers without a measurable assessment system. There is no decision support system (DSS) that can assist management in providing recommendations for the best decoration concepts objectively and quickly. The assessment criteria for each decoration concept have not been standardized, making it difficult to compare one alternative with another based on consistent data.

B. Literature Study

Literature study is a stage in which theoretical foundations are sought from various journals and the results of similar research conducted by others in the past. This literature consists of theories and methods, as well as other findings that have been used to address problems that have occurred in the past. Thus, this literature study provides a sound and reliable scientific basis.

C. Collecting Data

Data collection was conducted at Mainaka Decoration to obtain information related to decoration concept selection. The data used in this study consisted of five decoration concept alternatives, namely Rustic Greenery, Glam Gold, Minimalist White, Bohemian Pastel, and Traditional Elegant. These alternatives were evaluated based on five decision criteria, including budget, aesthetics, processing time, theme suitability, and decorative material durability.

The research data were obtained through several techniques. Direct observation was conducted to understand the decoration concept selection process used by the company. Interviews were carried out with designers and management at Mainaka Decoration to determine relevant criteria and assess each decoration alternative. In addition, documentation was used to collect historical project information and decoration concept descriptions. The values of each criterion were then converted into a rating scale to form the decision matrix used in the SAW calculation process.

D. Analysis Data

Data analysis is conducted to process and interpret all information obtained through observation, interviews, and documentation [19].

E. Design System

After completing the data analysis stage, the next step is system design. The system design aims to describe how the Decision Support System for selecting the best decoration concept will operate and interact with users. In this study, the system design is modeled using Unified Modeling Language (UML) to visualize the structure and behavior of the system before implementation.

The UML model used in this research is the Use Case Diagram, which illustrates the interaction between the system and the user (admin). The admin is responsible for managing the system by performing several activities such as managing criteria data, managing alternative decoration concepts, performing SAW calculations, and generating reports of the decision results. Through this diagram, the relationship between system functions and user actions can be clearly identified.

In addition, database design is carried out to store data related to criteria, alternative decoration concepts, and calculation results. The system interface is also designed to

provide an easy-to-use environment that allows users to input data, process calculations using the SAW method, and view ranking results efficiently. This design stage serves as the blueprint for the development of the web-based decision support system.

F. Building System

The system was developed using PHP programming language and MySQL database.

G. Testing System

In this stage, system testing is carried out to see whether the created system is capable of solving problems as expected. Here, the testing of the created system uses the Blackbox testing method. [20]. The Blackbox method is a method used to find errors and demonstrate the functionality of an application when it is in operation, whether the input is accepted correctly and the output produced is as expected.

H. Implementation System

After the system testing is done, the next step is system implementation. This stage is carried out to create and determine the results of the design that has been made.

III. RESULT AND DISCUSSION

A. Analysis Data

The following are the criteria for determining the best decoration concept at Mainaka Decoration;

Table 1. Criteria and Weight

Code	Criteria	Code	Wight
C1	Budget	C1	0.25
C2	Aesthetics	C2	0.30
C3	Processing Time	C3	0.15
C4	Theme	C4	0.20
C5	Decorative Material Durability	C5	0.10

Table 2. Alternative

Code	Name
A1	Rustic Greenery
A2	Glam Gold
A3	Minimalist White
A4	Bohemian Pastel
A5	Traditional Elegant

In determining the best decoration concept, analyze each of the above alternatives and enter them into the alternative value table that has been adjusted to the values of each sub-criterion presented in Table 3 below.

Table 3. Alternatives for Each Criterion

Code	Name	Criteria				
		C1	C2	C3	C4	C5
A01	Rustic Greenery	3	4	3	4	4
A02	Glam Gold	5	5	4	5	4
A03	Minimalist White	2	3	2	3	3
A04	Bohemian Pastel	3	4	3	4	3
A05	Traditional Elegant	4	4	4	5	5

To determine the transformation value into matrix X, the value of the above compatibility rating results is converted into a matrix.

$$X = \begin{pmatrix} 3\,4\,3\,4\,4 \\ 5\,5\,4\,5\,4 \\ 2\,3\,2\,3\,3 \\ 3\,4\,3\,4\,3 \\ 4\,4\,4\,5\,5 \end{pmatrix}$$

After performing the above calculations, the value of matrix R in Table 5 below is obtained:

Table 4. Normalisation Value

Code	Name	Value				
		C1	C2	C3	C4	C5
A1	Rustic Greenery	0.6	0.8	0.75	0.8	0.8
A2	Glam Gold	1	1	1	1	0.8
A3	Minimalist White	0.4	0.6	0.5	0.6	0.6
A4	Bohemian Pastel	0.6	0.8	0.75	0.8	0.6
A5	Traditional Elegant	0.8	0.8	1	1	1

To determine the Preference (V) value, the normalized alternative results are multiplied by each criterion and then added together.

After calculating the Preference (V) values, the highest value is obtained as the best alternative. The following are the alternative rankings in Table 6:

Table 6. Rank Result

Code	Name Product	Result	Rank
A3	Minimalist White	0.76	1
A2	Glam Gold	0.755	2
A1	Rustic Greenery	0.748	3
A5	Traditional Elegant	0.74	4
A4	Bohemian Pastel	0.728	5

B. Design System

The broadly designed system process has been drawn in the Use Case Diagram as follows:

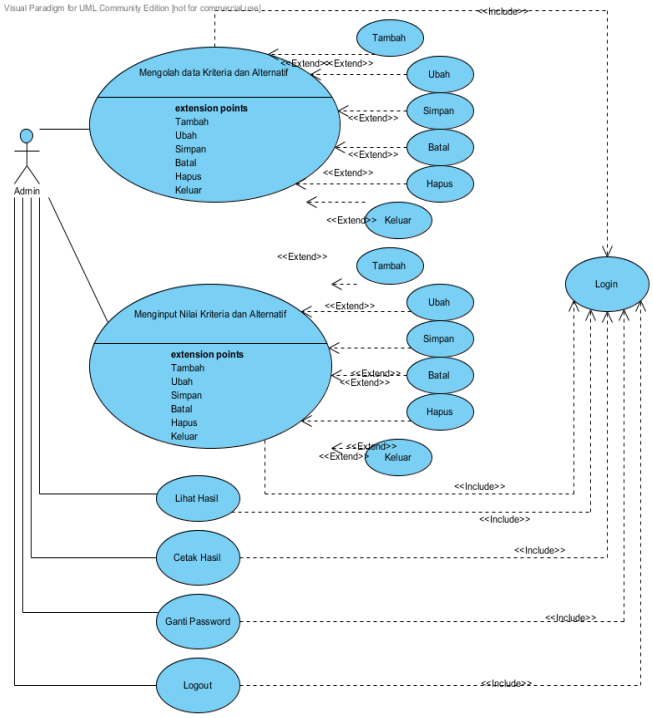

Figure 2. Use Case Diagram

C. Implementation System

1. Main Page

The main page is the page that appears when we have finished logging in, and various other menus will appear.

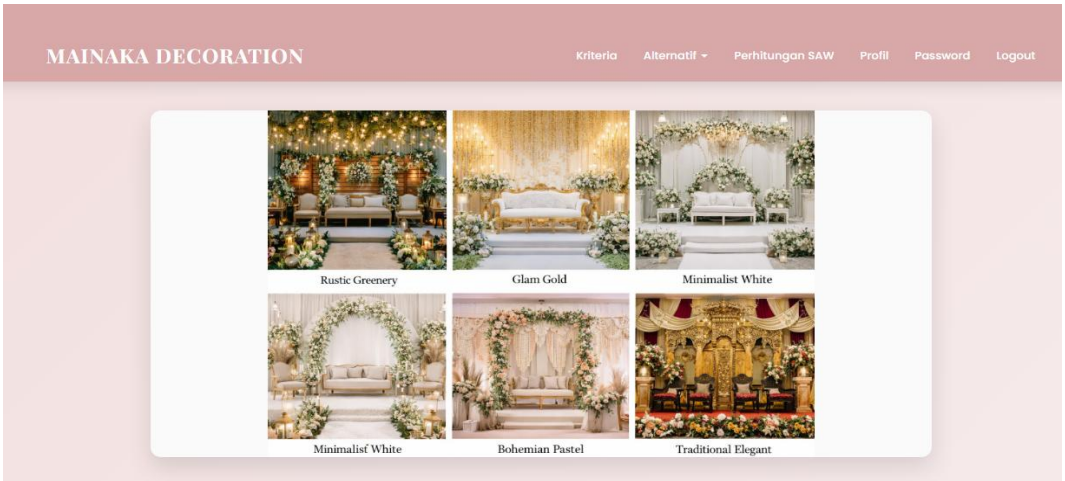

Figure 3. Main Page

2. Criteria Page

This page lists the existing criteria and the weighting of each criterion.

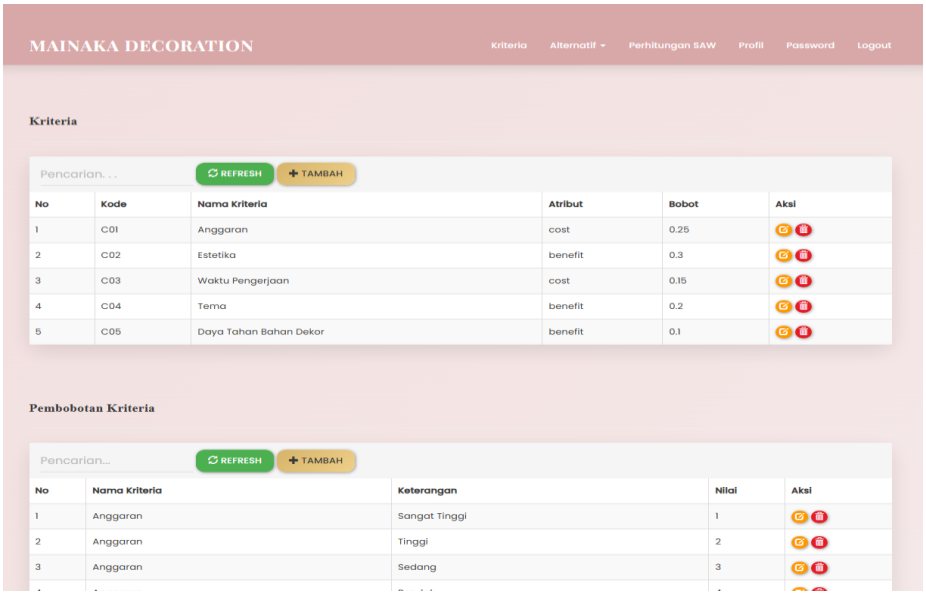

Figure 4. Criteria Page

3. Alternative Page

This page is an alternative page, and the alternative data can be seen in the image below.

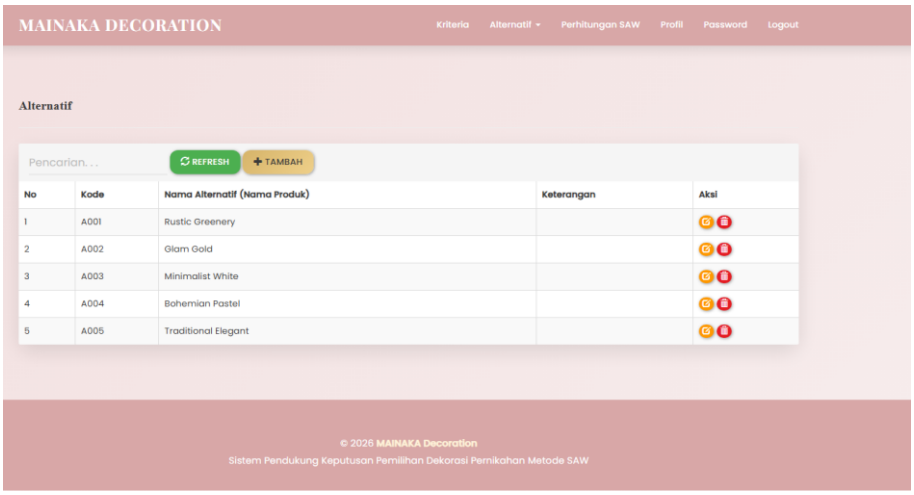

Figure 5. Alternative Page

4. SAW Calculation Page

This page will display the calculation process in detail, as shown in the image below.

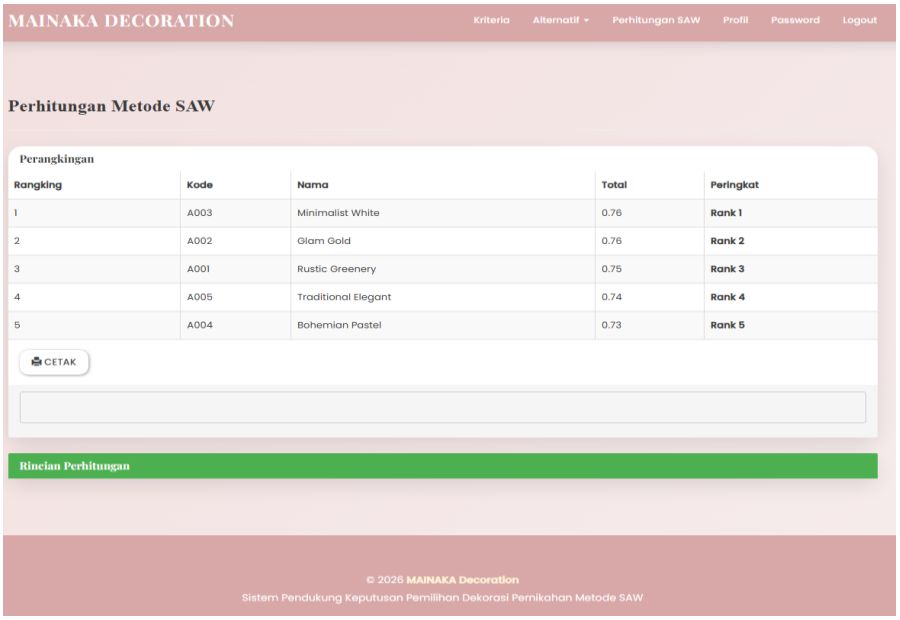

Figure 6. SAW Calculation Page

5. Report Page

This page is for displaying printed reports that will be submitted to management or for signature.

MAINAKA DECORATION

Jalan Bayam Siumbut Umbut, Kisaran
Kabupaten Asahan

LAPORAN HASIL PERHITUNGAN
PENERAPAN SAW UNTUK DEKOR TERBAIK DI MAINAKA DECORATION

Ranking	Kode	Nama Produk	Nilai Preferensi	Peringkat
1	A003	Minimalist White	0.76	Rank 1
2	A002	Glam Gold	0.76	Rank 2
3	A001	Rustic Greenery	0.75	Rank 3
4	A005	Traditional Elegant	0.74	Rank 4
5	A004	Bohemian Pastel	0.73	Rank 5

Kisaran, 23 January 2026
Pimpinan Mainaka Decoration

Rini Apriaty

Figure 7. Report Page

D. Comparison of Decision-Making Results Before and After Using the SAW Method

Before implementing the proposed SAW-based Decision Support System, the selection of decoration concepts at Mainaka Decoration was conducted manually based on the designer's intuition and experience. This approach often led to inconsistent decisions, longer processing time, and difficulty in objectively comparing alternatives. The evaluation process required approximately 30–45 minutes per client because each criterion was assessed separately without a structured calculation model.

After applying the SAW method through the developed system, the decision-making process became structured, measurable, and faster. The system automatically calculates

normalization values and preference scores based on predetermined weights, reducing the decision time to approximately 10–15 minutes per client.

Table 7. Comparison Before and After SAW Implementation

Indicator	Before SAW (Manual)	After SAW (System-Based)
Decision Basis	Designer intuition	Weighted criteria calculation
Decision Time	30–45 minutes	10–15 minutes
Objectivity Level	Subjective	Quantitative & measurable
Alternative Comparison	Not systematically ranked	Automatically ranked
Consistency of Results	Inconsistent	Consistent based on formula

The results show that the implementation of the SAW method improves efficiency by reducing decision-making time by approximately 60–65%. In addition, the system enhances objectivity because all alternatives are evaluated using the same weighted criteria formula. The ranking results (Table 6) indicate that Minimalist White (A3) obtained the highest preference value (0.76), demonstrating that the method can clearly identify the most optimal decoration concept based on measurable parameters. Thus, the proposed method not only digitizes the process but also improves accuracy, transparency, and consistency in selecting decoration concepts at Mainaka Decoration.

IV. CONCLUSION

Based on the research that has been conducted, it can be concluded that the Simple Additive Weighting (SAW) method can be applied well in the decision-making process because it is able to process several decoration alternatives based on predetermined criteria, namely budget, aesthetics, work time, theme, and material durability. The SAW method calculations produce preference values that can be used as a basis for determining the best decoration alternative according to the client's needs and priorities. With this decision support system, the decision-making process at Mainaka Decoration becomes faster, more accurate, and more efficient, with the potential to increase customer satisfaction.

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