

# Analysis of the Design of a Decision-Making System for Assessing Employees and Clothing Products using the Simple Additive Weight Method Web-Based

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## Abstract

DNA Boutique GALLERY is a boutique that is engaged in Muslim clothing products for young women with dynamic and elegant designs that adapt to the times, attracting Muslim women to like to cover their genitals completely in avoiding their genitals. This boutique in its development is often highlighted regarding its employees and fashion design products. For this reason, it is necessary to evaluate employees and boutique clothing products. Employee assessment on DNA.GALLERY is often done to see how much loyalty employees have to boutique stores and customers in determining superior employees when working every day. And DNA.GALERI boutique products produce superior product designs and materials for consumers where every day consumers will judge for themselves which product design on superior clothing is judged by the public when buying it. In this assessment, a method is used to calculate the overall criteria in terms of using the decision result assessment method, namely the saw method, and also assessing employees and products, a web-based system is made so that shop owners and the public are easy to input the assessment. The results of the research on the first employee assessment decision making on employees 5 out of 5 employees with a value of 0.96 from the criteria, Attendance, Discipline, Loyalty, Wages and the assessment of superior clothing products on clothes 5 out of 10 candidates for boutique clothing products that are judged by the community with value 1.01.

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## I. INTRODUCTION

Indonesia is a developing country in its economy, both private and public companies, one of which Indonesian products produce primary, secondary, and tertiary needs. To realize the activities of buying and selling goods, a product can run smoothly and normally, it is necessary to have employees and products that will later be sold and distributed. And Indonesia is a country that is currently developing in technology and internet networks that always follow the modern era so that people can easily access and explore information needs when people need something, for that several companies and traders have now invested in a-based program *web* and *mobile* so that people can easily access the *website* companies regarding information on what products are sold and can compare them with other products, Employees are important actors to run or process raw materials so that they can be used in the community and distributed and sold these products to land and water, Employees assist in boosting sales of clothing products in various ways. Ways that can be done to increase sales are by way of marketing, offering to consumers, and clothing products are a mandatory requirement to cover body parts, to protect body parts, and get comfort from the quality of materials and product design. DNA.GALERI boutique is a boutique engaged in Muslim clothing products for young women with a dynamic and elegant design that adapts to the times, attracting the attention of Muslim women to love covering their genitals more and avoiding their aurat. In this case, employees and products are continuously optimized

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to provide satisfactory results to customers, so an assessment of employees and boutique clothing products is needed using the method SAW which can be combined using a web-based so that shop owners and customers are very easy and effective in assessing employees and products. clothing design clothes as best as possible, For this reason, the owner of this boutique requires a decision making in employee assessment and assessment of superior clothing products so that employee performance results and product assessments can be measured to continue development in consideration of the results of these values who are good employees and superior clothing products in his assessment.

## II. LITERATURE REVIEW

### Decision-making decision-making

System system is an analysis of the results of the calculation of the incorporation of the relevant criteria formation to support in determining the results that can be recommended into information as decisions [1].

### Simple Additive Weighting (SAW)

The SAW method is the concept of a decision-making system in determining the weight of the additional criteria by entering a scale matrix The assessment that has been determined to produce the largest and smallest numbers from the selected rating scale [2].

### Unified Modeling Language (UML)

is a system building model in designing a system problem, the order in calculating in the method, and an overview of a user system in running the new system.

### Employee

Employees are human resources that are used in a company to help smooth things out in a job.

## III. METHODS

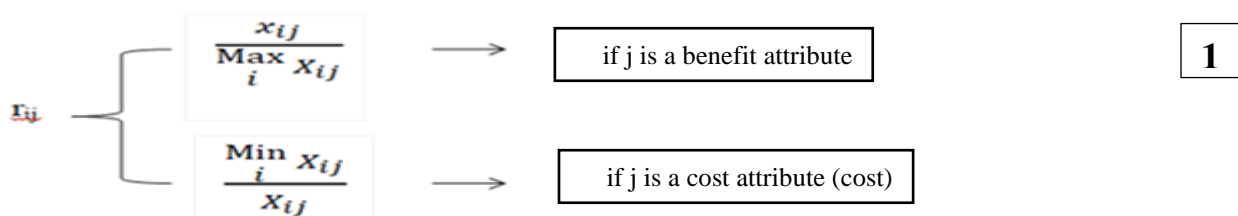
This research method is quantitative, this research activity goes through several stages in the development of collecting library material related to the title. Then the next step is a direct survey to the research site at the DNA.GALERI boutique located in the Cilegon Banten area. From the research, there are several criteria used for further research, namely regarding employee assessments and boutique design products which are then processed by the data to produce a decision to develop the boutique business. So, this study uses the SAW method, which is short for *Simple Additive Weight*, which is calculated algorithmically to produce a decision based on various criteria.

According to Saputra, M [1] [1]., & Aprilian, L. V., *simple additive weighting (SAW)* is a weighted addition method. The basic concept of the SAW method is to find the weighted sum of the performance ratings for each alternative on all criteria. The method SAW requires the process of normalizing the decision matrix to a scale that can be compared with all existing alternative ratings. This method requires the decision-maker to determine the weight for each attribute.

According to Saputra and Aprilian (2020:19) the steps in the method *simple additive weighting (SAW)* are as follows:

1. Determine the criteria that will be used as a reference in making decisions, namely.
2. Determine the suitability rating of each alternative on each criterion.
3. Plan matrix based on the criteria ( $C_i$ ) then normalize the matrix based on the equation that is adjusted to the type of attribute (profit attribute or cost attribute) to obtain a normalized matrix  $R$ .
4. The result is obtained from the sorting process, namely, the addition of the normalized matrix multiplication  $R$  with the weight vector so that the largest value is chosen as the best alternative ( $A_i$ ) as the solution.

The formula to perform the normalization:



The formula to perform the with:

Rij = value normalization

Xij = Attribute value *rating* normalized performance of each criterion *i*

Max Xij = The largest value of each criterion

Min Xij = The smallest value of each criterion *i*

Where Rij is the normalized performance rating of alternative *Ai* on attribute *Cj*, *i* = 1, 2,...*m* and *j* = 1,2,...*n*

The preference values for each alternative (*Vi*), are as follows:

$$V_i = \sum_{j=1}^n W_j r_{ij}$$

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With:

*Vi* = sequence for each alternative

*Wj* = weight value of each criterion

*Rij* = normalized performance rating

value *A* greater value of *Vi* indicates that alternative *Ai*, is preferred.

The decision-making system in assessing employees and boutique clothing products here uses the simple additive weight method which will later formulate the input method into the web base so that shop owners and customers who have purchased boutique clothing products there can assess boutique clothing employees and products using the system to be more effective and efficient. easy to provide informed decision results.

### Population

Population in this study are employees and products of boutique clothing at DNA.GALLERY Cilegon Banten who work every day to develop the boutique clothing business and increase employee productivity while working at the boutique.

### Sample

This sample was carried out using a technique *purposive sampling* is a technique for one of the research objectives, namely, to get samples of results that are not monotonous so that there are good and bad results. The samples used in this study amounted to 5 employee data and 10 boutique clothing products in 2021 which were located at DNA.GALERI Cilegon, Banten.

TABLE 1  
LIST OF EMPLOYEES

No	Name	Part	Amount
1	Employee 1	Treasurer	1
2	Employee 2	Marketing	1
3	Employee 3	Sales	3
4	Employee 4	Sales	
5	Employee 5	Sales	
Employee Total			5

TABLE 2  
LIST OF BOUTIQUE CLOTHING PRODUCTS

No	Name	Model	Amount
1	Outfit 1	A	10
2	Outfit 2	B	
3	Outfit 3	C	
4	Outfit 4	D	
5	Outfit 5	E	

6	Outfit 6	F
7	Outfit 7	G
8	Outfit 8	H
9	Outfit 9	I
10	Outfit 10	J

In this SAW method, the calculation of employee appraisal consists of the criteria of discipline, attendance, loyalty, years of service, and wages. To determine the weight of the employee assessment criteria using costs and benefits, so that the determination of the criterion value scale can be calculated fairly in using costs and benefits, the value of the benefits itself consists of the criteria of discipline, attendance, and loyalty, then the value of the cost itself consists of the following criteria: years of service and wages.

#### A. Calculation of Employee Assessment

TABLE 3  
CRITERIA WEIGHT

No	Weight Value	Criteria	Value
1	5	Discipline	30%
2	5	Presence	30%
3	3	Loyalty	20%
4	3	Tenure	10%
5	2	Wage	10%
Total			100%

The rating rating scale is an important value for assessing the size of the shop owner in assessing his employees, which consists of numbers 1 to 5 or the lowest to the highest value.

#### B. Calculation of Employee Rating Scale

TABLE 4  
EMPLOYEE RATING SCALE

No	Weight	Keterangan
1	1	Very not good
2	2	Not good
3	3	Fairly good
4	4	Good
5	5	Very Good

#### C. Employee Rating Information Weight

The results of the overall value of employee assessments will produce decisions that can be information for store owners to reward employees who are superior to other candidates.

TABLE 5  
RATING INFORMATION EMPLOYEE

No	Weight	Information
1	0.850 - 0.900	Very good
2	0.750 - 0.800	Well
3	0.600 - 0.700	Pretty good
4	0.400 - 0.550	Not good

How to calculate using the method *Simple Additive Weight*

- The rules for assessing the value of presence, discipline, loyalty, years of service, wages range from 1-5
- The determination of the *benefits* consists of the value of presence, discipline, loyalty, years of service, and the determination of the *cost* which consists of the value of wages.
- The benefit value is divided by the predetermined value as well as the cost value is divided by the predetermined value from those who assess the employee or owner of Boutique
- The benefit value is the largest sought value, and the lowest cost value is sought from the 5 employees
- After getting the results from the sum of benefits and costs, the next step is to combine the value of benefits, costs from the assessment criteria to a predetermined weight

#### D. Calculation of Product Assessment Criteria

TABLE 6  
CRITERIA WEIGHT

No	Criteria	Range of values	Weights
1	Product Design	4	40%
2	Product quality	4	30%
3	Product Motif	5	20%
4	Product Price	4	10%
<b>Total</b>			100%

#### E. Calculation of product Scale Rating

TABLE 7  
PRODUCT SCALE RATING

No	Weights	Information
1	1	Not very good
2	2	Not good
3	3	Pretty good
4	4	Well
5	5	Very good

#### F. Information Weight of Clothing Boutique Product Rating

The results of the overall value of boutique clothing products will produce informed decisions for store owners in providing maintaining and developing the clothing products themselves.

TABLE 8  
RATING INFORMATION CLOTHING

No	Weight	Information
1	0.90 - 1.10	Very good
2	0.60 - 0.80	Well
3	0.50 - 0.60	Pretty good
4	0.40 - 0.50	Not good

How to calculate using the method *Simple Additive Weight*

- Rules for the assessment of the value of product design, product quality, product motifs, and product prices range from 1-5
- Determination of benefits consists of the value of product design, product quality, product motifs, and product prices
- After getting the results of the sum of the benefits, the next step is to add up the value of the benefits.

#### Activity Diagram for Appraisal of Clothing Products SAW Method

Activity diagram ini merupakan algoritma penilaian produk baju butik yang berbeda dengan activity diagram penilaian karyawan karena penentuan benefit dan cost dalam metode SAW berbeda.

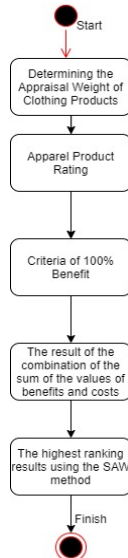


Fig. 1 Activity Diagram of Employee Assessment SAW method

**Activity Diagram of Employee Assessment Method SAW**

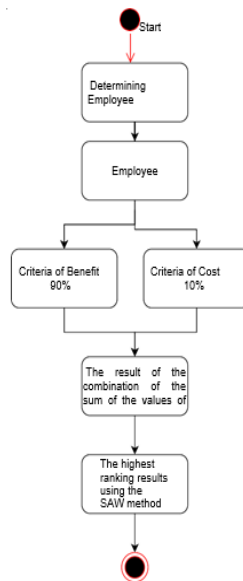


Fig. 2 Activity Diagram of Product Assessment SAW Method

**FRAMEWORK**

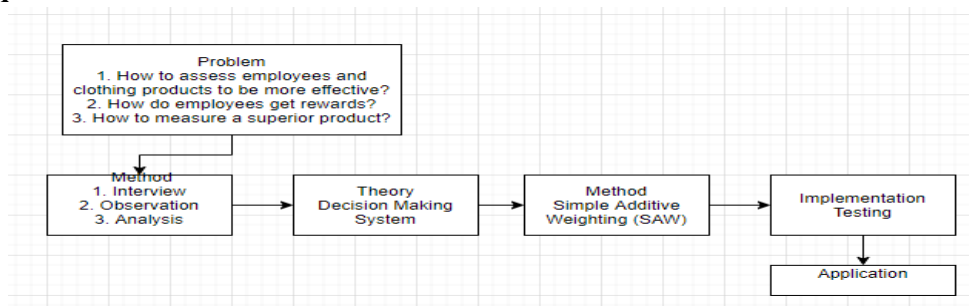


Fig. 3 Thinking Framework

IV.RESULTS

A. RESULTS OF PROCESSING EMPLOYEE JOB DATA

TABLE 9  
EMPLOYEE ASSESSMENT

No	Name	Value Attendance	Value Discipline	Value Loyalty	Value Period of Service	Wage Value
1	Employee 1	4	5	4	4	3
2	Employee 2	3	4	5	3	4
3	Employee 3	4	3	4	3	2
4	Employee 4	5	3	4	5	5
5	Employee 5	5	5	5	5	3

TABLE 10  
DETERMINING THE DENEFFITS AND COSTS OF THE SIMPLE ADDITIVE WEIGHT METHOD

No	Name	Value Attendance	Value Discipline	Value Loyalty	Value Period of Service	Wage Value
1	Employee 1	4 : 5 = 0.8	5 : 5 = 1	4 : 5 = 0.8	4 : 5 = 0.8	2 : 3 = 0.6
2	Employee 2	3 : 5 = 0.6	4 : 5 = 0.8	5 : 5 = 1	3 : 5 = 0.6	2 : 4 = 0.5
3	Employee 3	4 : 5 = 0.8	3 : 5 = 0.6	4 : 5 = 0.8	3 : 5 = 0.6	2 : 2 = 1
4	Employee 4	5 : 5 = 1	3 : 5 = 0.6	4 : 5 = 0.8	5 : 5 = 1	2 : 5 = 0.4
5	Employee 5	5 : 5 = 1	5 : 5 = 1	5 : 5 = 1	5 : 5 = 1	2 : 3 = 0.6

TABLE 11  
COMBINED VALUE BETWEEN BENEFITS, COSTS, AND WEIGHT CRITERIA

No	Criteria Name	Employee 1	Employee 2	Employee 3	Employee 4	Employee 5
1	Value Attendance 30%	0.8 x 0.30 = 0.24	0.6 x 0.30 = 0.18	0.8 x 0.30 = 0.24	1 x 0.30 = 0.3	1 x 0.30 = 0.3
2	Value Discipline 30%	1 x 0.30 = 0.3	0.8 x 0.30 = 0.24	0.6 x 0.30 = 0.18	0.6 x 0.30 = 0.18	1 x 0.30 = 0.3
3	Value Loyalty 20%	0.8 x 0.20 = 0.16	1 x 0.20 = 0.2	0.8 x 0.20 = 0.16	0.8 x 0.20 = 0.16	1 x 0.20 = 0.2
4	Value Period of Service 10%	0.8 x 0.10 = 0.08	0.6 x 0.10 = 0.06	0.6 x 0.10 = 0.06	1 x 0.10 = 0.1	1 x 0.10 = 0.1
5	Wage Value 10%	0.6 x 0.10 = 0.06	0.5 x 0.10 = 0.05	1 x 0.10 = 0.1	0.4 x 0.10 = 0.04	0.6 x 0.10 = 0.06
<b>Jumlah</b>		<b>0.84</b>	<b>0.73</b>	<b>0.74</b>	<b>0.78</b>	<b>0.96</b>

Note:

The results of the calculation of employee assessment using the SAW method are the best for employee 5 in the first rank and rank 2 for employee 1 and followed by rank 3 for employee 4, and ranking positions 4 and 5 for employee 3 and employee 2.

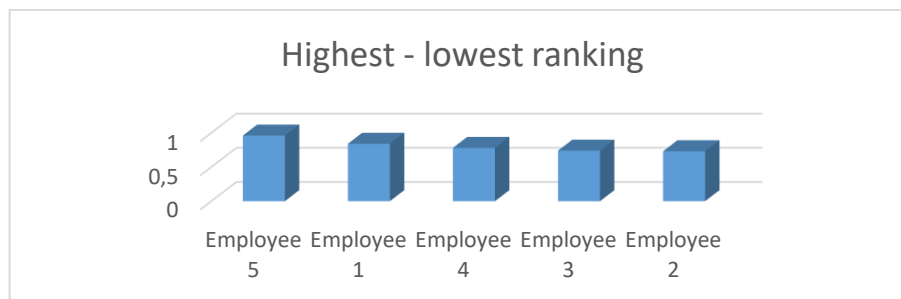


Fig. 4 Highest Ranking Employee Value

Description: The result of the highest score on employee 5 with a value of 0.96

TABLE 12  
PRODUCT RATING

No	Models of clothes	Product Design	Product quality	Product Motif	Product Price
1	Employee 1	2	2	3	4
2	Employee 2	4	3	3	3
3	Employee 3	3	3	4	4
4	Employee 4	1	2	3	4
5	Employee 5	5	4	3	2
6	Employee 6	4	3	2	1
7	Employee 7	3	3	2	2
8	Employee 8	4	4	4	5
9	Employee 9	4	5	3	4
10	Employee 10	3	4	3	4

TABLE 13  
DETERMINING THE bENEFITS AND COSTS OF THE SIMPLE ADDITIVE WEIGHT METHOD

No	Models of clothes	Product Design	Product quality	Product Motif	Product Price
1	Employee 1	2:4	2:4	3:5	4:4
2	Employee 2	4:4	3:4	3:5	3:4
3	Employee 3	3:4	3:4	4:5	4:4
4	Employee 4	1:4	2:4	3:5	4:4
5	Employee 5	5:4	4:4	3:5	2:4
6	Employee 6	4:4	3:4	2:5	1:4
7	Employee 7	3:4	3:4	2:5	2:4
8	Employee 8	4:4	4:4	4:5	5:4
9	Employee 9	4:4	5:4	3:5	4:4
10	Employee 10	3: 4	4:4	3:5	3:4

TABLE 14  
COMBINED VALUE OF BENEFITS, COSTS WITH CRITERIA

No	Criteria name	Outfit 1	Outfit 2	Outfit	Outfit 4	Outfit 5	Outfit	Outfit 7	Outfit 8	Outfit 9	Outfit 10
1	Product Design 40%	$0.5 \times 0.40 = 0.2$	$1 \times 0.40 = 0.4$	$0.75 \times 0.40 = 0.3$	$0.25 \times 0.40 = 0.1$	$1.25 \times 0.40 = 0.5$	$1 \times 0.40 = 0.4$	$0.75 \times 0.40 = 0.3$	$1 \times 0.40 = 0.4$	$1 \times 0.40 = 0.4$	$0.75 \times 0.40 = 0.3$
2	Product quality 30%	$0.5 \times 0.30 = 0.15$	$0.75 \times 0.30 = 0.225$	$0.75 \times 0.30 = 0.225$	$0.5 \times 0.30 = 0.15$	$1 \times 0.30 = 0.3$	$0.75 \times 0.30 = 0.225$	$0.75 \times 0.30 = 0.225$	$1 \times 0.30 = 0.3$	$1.25 \times 0.30 = 0.375$	$1 \times 0.30 = 0.3$
3	Product Motif 20 %	$0.6 \times 0.20 = 0.12$	$0.6 \times 0.20 = 0.12$	$0.8 \times 0.20 = 0.16$	$0.8 \times 0.20 = 0.16$	$0.8 \times 0.20 = 0.16$	$0.4 \times 0.20 = 0.08$	$0.4 \times 0.20 = 0.08$	$0.8 \times 0.20 = 0.16$	$0.6 \times 0.20 = 0.12$	$0.6 \times 0.20 = 0.12$



4	Product 10%	Price	$1 \times 0.10 = 0.1$	$0.75 \times 0.10 = 0.075$	$1 \times 0.10 = 0.1$	$1 \times 0.10 = 0.1$	$0.5 \times 0.10 = 0.05$	$0.25 \times 0.10 = 0.025$	$0.5 \times 0.10 = 0.05$	$1.25 \times 0.10 = 0.125$	$1 \times 0.10 = 0.1$	$0.75 \times 0.10 = 0.075$
<b>Total</b>			<b>0.57</b>	<b>0.82</b>	<b>0.785</b>	<b>0.51</b>	<b>1.01</b>	<b>0.73</b>	<b>0.655</b>	<b>0.985</b>	<b>0.995</b>	<b>0.795</b>

Description: The results of the product calculation on the best clothing model are in shirt 9 with a total of 0.995 and ranking 2 on shirt 8 with a value of 0.985, ranking 3 with a value of 0.795 on shirt 10, and ranking 4 for clothes 3 with a value of 0.785, ranking 5 on shirt 7 with a value of 0.655, rank 6 on shirt 2 with a value of 0.82, rank 7 on shirt 6 with a value of 0.73, rank 8 on shirt 1 with a value of 0.57, rank 9 on shirt 4 with a value of 0.51 and finally rank 10 on shirt 5 with a value 0.01.

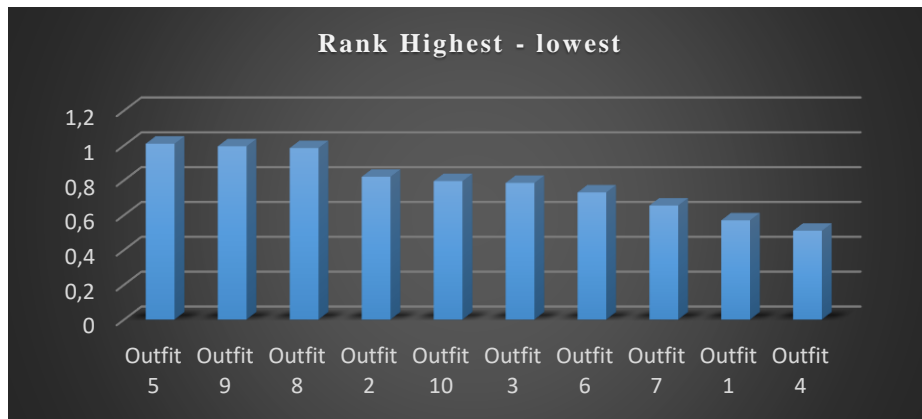


Fig. 5 The Highest Value of Clothing Products

**B. View Program in assessing employees and clothing products that have included the formulation of the SAW method**

1. Main View



Fig. 5 Main View

In this view, shop owners and consumers will have an account to log in first when assessing employees and assessing clothing products.

## 2. Employee Dashboard View

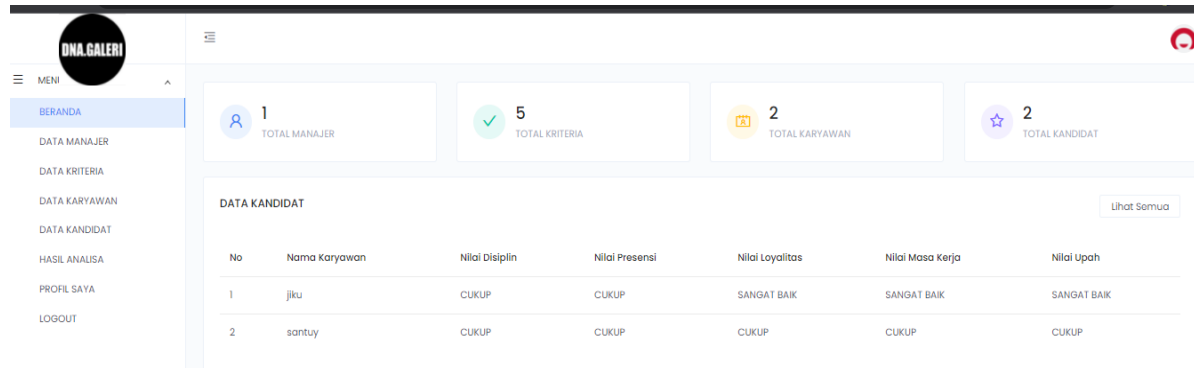


Fig. 6 Employee Dashboard View

This display is a dashboard to set the weight of the assessment and see the assessment of the results of the highest value ranking

## 3. Clothing Products Dashboard view

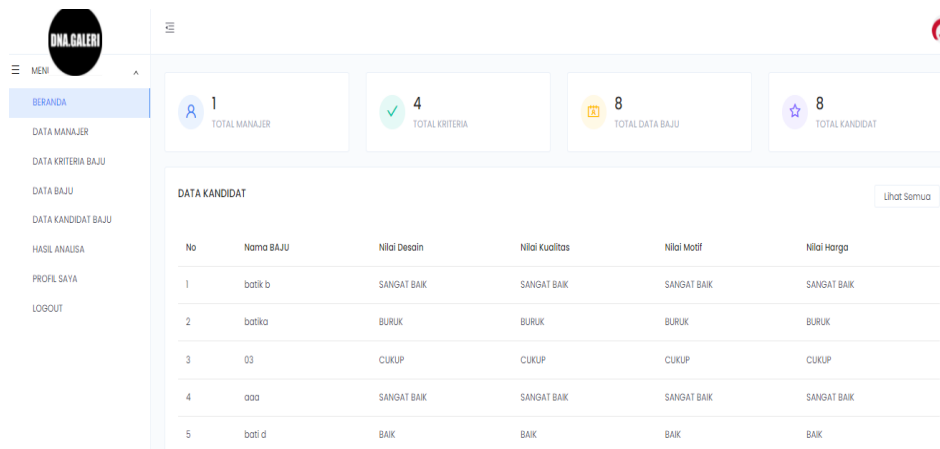


Fig. 7 Clothing Products Dashboard view

This display is a dashboard to set the weight of the assessment of Clothing Products and see the assessment of the results of the highest value ranking.

## V. CONCLUSIONS

Based on the analysis and discussion of employee assessments and clothing products at the DNA.GALLERY Cilegon Boutique, it can be concluded as follows:

1. The evaluation of the DNA.GALLERY Boutique employees who are the highest in their rankings who deserve to get years of Service *rewards* from the criteria of Presence, Discipline, Loyalty, Wages are 5 employees with a value of 0.96
2. The highest evaluation of the DNA.GALLERY Boutique clothing product is the clothing product or the model that deserves to be recommended for the development of model design, namely 5 clothing products with a value of 1.01
3. The lowest evaluation of DNA.GALERI Boutique employees is employee 2 with a score of 0.73.
4. The lowest evaluation of DNA.GALLERY Boutique Clothing is in its ranking on clothes 4 with a value of 0.51.
5. The design of this web-based employee and product assessment makes it easier for shop owners and consumers when assessing web programs with the formulation of the SAW method

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