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Application of Simple Additive Weighting (SAW) Method in Selecting the Best Employee Performance (Case Study: CV. Syntax Corporation Indonesia)

Sukma Hendrian[1*], Marsani Asfi[2], Rifqi Fahrudin[3]
Universitas Catur Insan Cendekia, Indonesia
Email: sukmahendrian123@gmail.com[1*], marsani.asfi@cic.ac.id[2], rifqi.fahrudin@cic.ac.id[3]

*Correspondence

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ABSTRACT

This study discusses the application of the Simple Additive Weighting (SAW) method in selecting the best performance of employees in CV. Syntax Corporation Indonesia. The background of the problem involves challenges in assessing and Selecting the best employees objectively amid many assessment criteria. The purpose of the study is to implement the SAW method to improve accuracy and objectivity in performance assessment. The method used is SAW with predetermined criteria, as well as weight calculation and data normalization. The results show that the SAW method is effective in simplifying the evaluation process and producing more accurate employee ratings based on relevant criteria. The results of this study show that the SAW method can identify employees with the best performance systematically and transparently. The application of this method results in employee ratings that are consistent with the company's evaluation goals and needs. By using SAW, CV. Syntax Corporation Indonesia can improve the accuracy of the assessment and provide more objective decisions in selecting the best employees. This study suggests that the SAW method should be applied more widely for performance-based decision-making in other companies.

Introduction

Technology is growing rapidly at this time to make all fields utilize a technology. One of the influences on technology is the internet which is a global online network without limits that provides millions of types of information (Suharto & Hariadi, 2021). The development of information technology is so needed by various fields of life that it can be warmly welcomed by the community. Therefore, technology is a means to help solve problems in various fields. In a company, Human Resources have the most important role (Sadikin et al., 2022). The role of Human Resources in a company cannot be separated from other management fields in achieving a company's goals. CV. Syntax

Corporation Indonesia will conduct a selection of the best employees to be able to spur employee enthusiasm in increasing dedication, performance, and being able to develop themselves to process to become even better. The selection of outstanding employees is carried out in rotation every year but has not been implemented optimally. This implementation is still based on attendance and performance values only (Afiq & Roby Candra Yudha, 2023).

Before creating a decision support system, two initial steps must be taken, including determining the problem analysis and needs analysis. Problem analysis can be useful for determining what problems are currently occurring, whether the problem is indeed a serious problem, and whether a solution must be found immediately (Bilgies, Tawil, Mardiah, & Arief, 2023). Needs analysis can be useful for determining what things will be needed in the future when building a decision support system after the problem analysis is carried out (Sukaryati & Voutama, 2022).

The model that will be used in this decision support system is the simple model. Additive weighting, this method is chosen because it can determine the weight value for each attribute, after that, there is a ranking process that will select the best employees from several employees at CV. Syntax Corporation Indonesia. This ranking method is expected to obtain an accurate assessment because it is based on several criteria and weight values that have been determined previously (Kurniawan & Santika, 2020).

As a computer-based system where this system consists of three interacting components, namely, a language system (a mechanism for providing communication between users and components, other Decision Support Systems), a knowledge system (a repository of problem domain knowledge that exists in the Decision Support System or as data or as procedures), and a problem processing system (the relationship between the other two components, consisting of one or more general problem manipulation capabilities needed for decision making (Amin, Sinulingga, Desy, Abas, & Sukarno, 2021).

The basic concept of the SAW method is to find the weighted sum of the performance ratings on each alternative on all attributes. The SAW method requires a normalization process of the decision matrix (X) to a scale that can be compared with all existing alternative ratings. Here are some previous studies as follows:

Research conducted by (Zumarniansyah, Ardianto, Alkhalifi, & Azizah, 2021), entitled "Implementation of the Best Employee Assessment Decision Support System Using the Simple Method Additive Weighting", with the final result showing that Saputra was the best employee with a percentage of 82% or equivalent to 0.82. The research conducted by (Nurrahmi & Misbahuddin, 2019), entitled "Comparison of SAW Methods (Simple Additive Weighting) and AHP (Analytic Hierarchy Process) In the Decision Support System for Selecting the Best Employees", By using this application, PT. XYZ will be able to select the best employees more systematically and objectively. This will make it easier for managers or HR teams to make more informed decisions and can support a more efficient employee selection process. Research conducted by (Syaputra & Eirlangga, 2023). Entitled "Implementation of the Simple Method Additive Weighting

(SAW) in Determining the Best Sales Employees". The application of the SAW method in assessing sales employees helps ensure that decisions are based on objective and measurable data and provides rewards to high achievers and opportunities for improvement for those who need them. Then the research conducted by (Ardiyansah & Amin, 2023) entitled "Application of the Simple Method Additive Weighting In The Selection Of The Best Employees At Momnnaura Online Store", The Results By using DSS, organizations can make more informed and objective decisions based on existing data. Recommendations generated by DSS can help improve efficiency and productivity in decision-making. And finally, in research conducted by (Panggabean, Mesran, & Manalu, 2021) entitled "Application of the Simple Method Additive Weighting (SAW) in Rewarding Honorary Employees Using Rank Order Centroid Weighting", The ranking results produced are more objective. This study was also able to identify that from several existing alternatives, namely A1, A8, and A6, these three alternatives have proven to be the best among honorary employees who deserve to be given rewards (Alamsyah, Herdiansah, Wijaya, & Rusdianto, 2024).

Simple Method Additive Weighting (SAW) is one of the methods in the decision-making process. This method has a more precise and accurate assessment capability because it is based on the specified criteria and weight values, thus helping to solve the problem of selecting high-performing employees quickly and precisely (Nahjan, Heryana, & Voutama, 2023). CV. Syntax Corporation Indonesia, which is oriented towards selecting the best employees, generally has certain standards in the process of selecting the best employees, here are standards, namely Discipline, Achievement of work targets, Innovation, Sharing knowledge, and competence.

Based on the problems that have been explained above, this study aims to implement a decision support system in selecting the best employee performance at CV. Syntax Corporation Indonesia (SCI) Cirebon. Then in this study, the Simple Method is applied Additive Weighting (SAW) for selecting the best employee performance at CV. Syntax Corporation Indonesia (SCI) Cirebon, makes it easier for the company to classify the best and worst employee performance.

Method

The method used in making decisions in this research is the SAW (Simple Analysis) method. Additive Weighting). Data is obtained through the process of selecting the best employees first. The data used is employee data for the last 2 years 2021-2022. The data collection method in this study was carried out by interviews, observations, and literature studies.

Results and Discussion

Simple Additive Weighting (SAW) Method Test Results in Excel

Implementation results testing application of data mining in determining reception candidate new employees using K-Nearest Neighbor (K-NN) with testing using the Rapidminer tool. Where with existing testing This system will know whether results

obtained manually are the same as results obtained in a way computerization. In this test using the application Rapidminer, The stages testing the application of data mining in determining results reception candidate new employees with K-Nearest Neighbor (K-NN) with application Rapidminer (Fauziyah et al., 2021).

Rapid Miner is a software platform powerful software for data science and learning machines. It provides diverse tools for data preparation, modeling, evaluation, and implementation. Rapid Miner is designed to be easy to use and allows users to with easy build and test various models, even without experience in programming. RapidMiner offers a drag-and-drop interface that allows users to build channel work to process and analyze data. This supports diverse data sources, including flat files, databases, and big data platforms such as Hadoop and Spark. The software also includes various operators that have built, which is block building from the groove work, which includes all data mining processes stages, such as data cleaning, selection features, and modeling [4].

The steps taken in determining employee best with the use of The Simple Additive Weighting (SAW) method on Rapid Miner are:

1. Entering data into a rapid miner
2. Do data calculation with the Simple Additive Weighting (SAW) method in Rapid Miner
3. View the output results calculation with Simple Additive Weighting (SAW) method in Rapid Miner
4. The process steps in determining employee best with the use of Simple Additive Weighting (SAW) method on Rapid Miner from the beginning until finished is :
   a. Open Rapid Miner Application

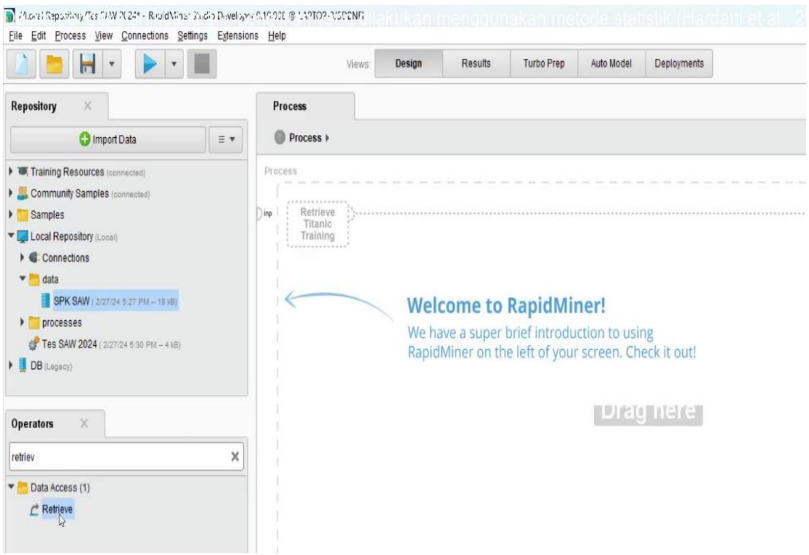


Figure 1
Initial View of Rapid Miner

b. Type Retrieve

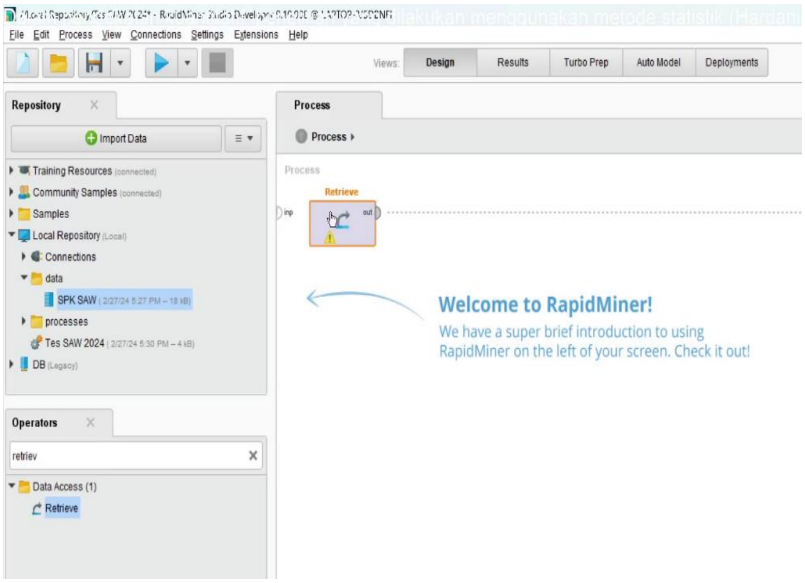


Figure 2
View After Type Retrieve on Rapid Miner

c. Get Data/Input Data

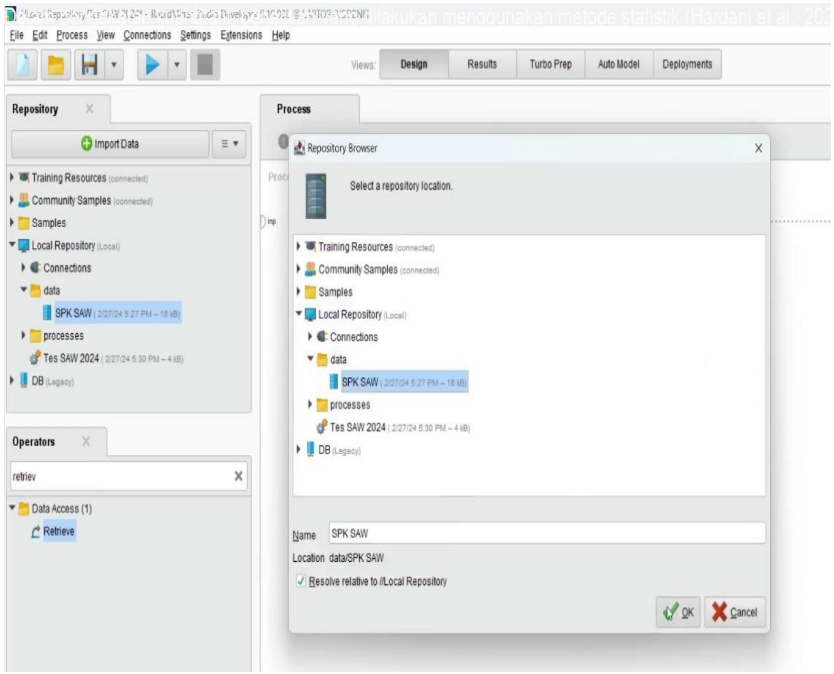


Figure 3
Display for Entering Data

d. After Input Data, Select Naïve Bayes

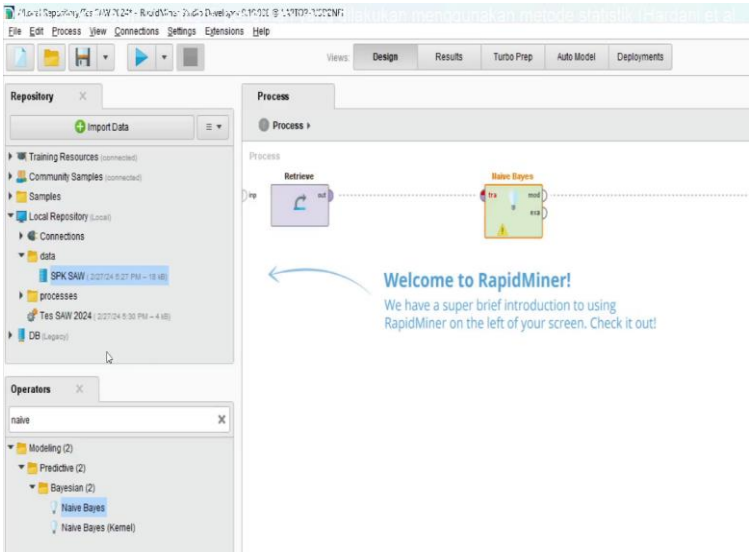


Figure 4
View Naïve Bayes Option

e. Select Apply Model

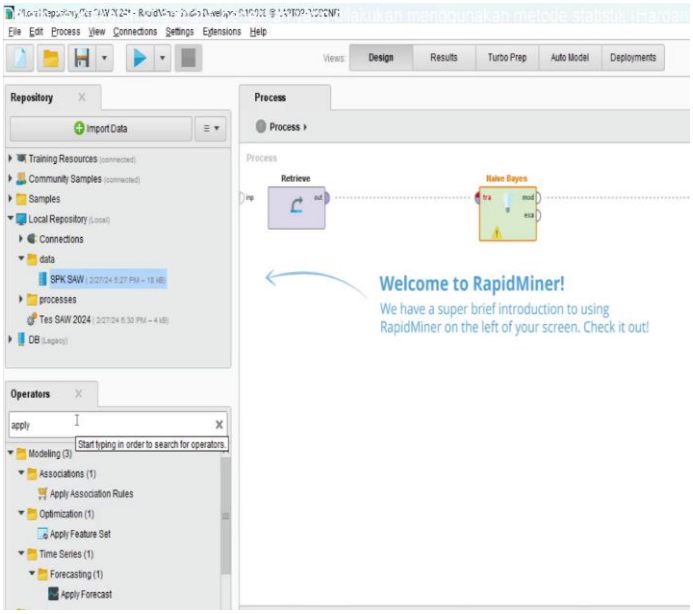


Figure 5
View After Apply Model

f. Link all in line form

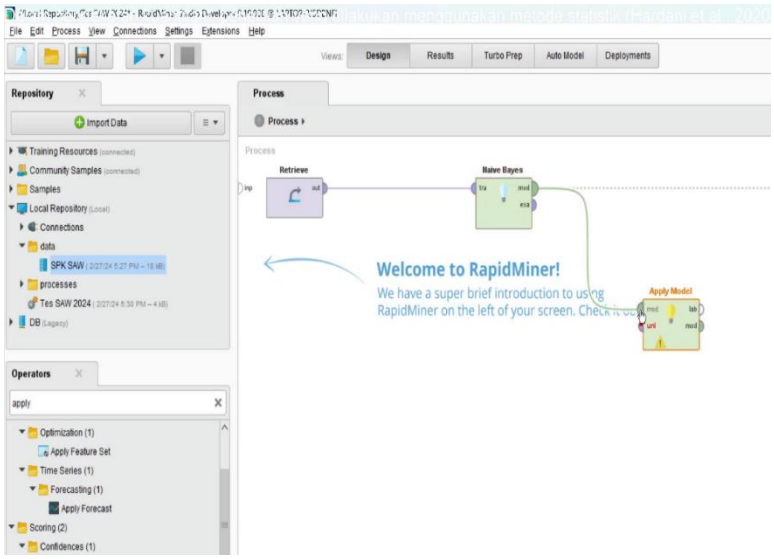


Figure 6
View After Linking Everything in Line Form

g. Make another retrieve (retrieve 2) and select performance (classification)

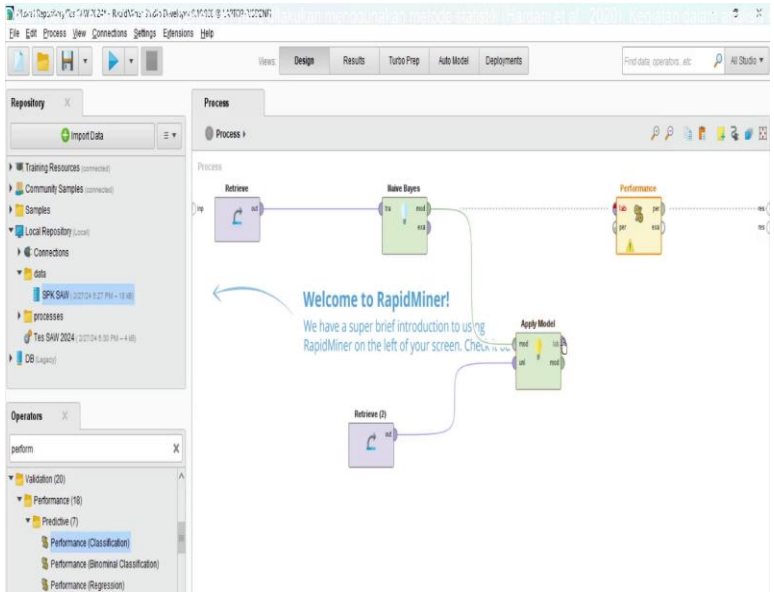


Figure 7
View After another retrieve (retrieve 2) and after select performance (classification)

h. Merge everything like the image below

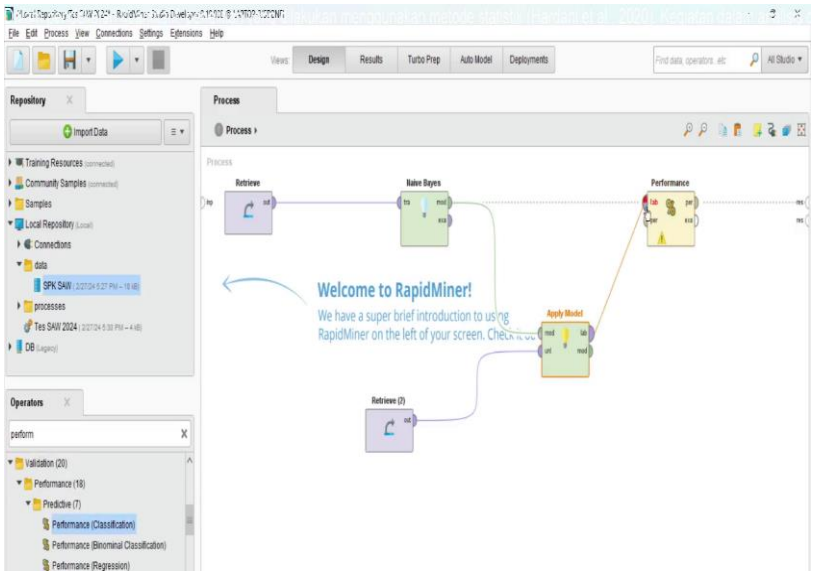


Figure 8
View Merger Overall

i. Once everything has been lined up, click run, the blue “play” button.

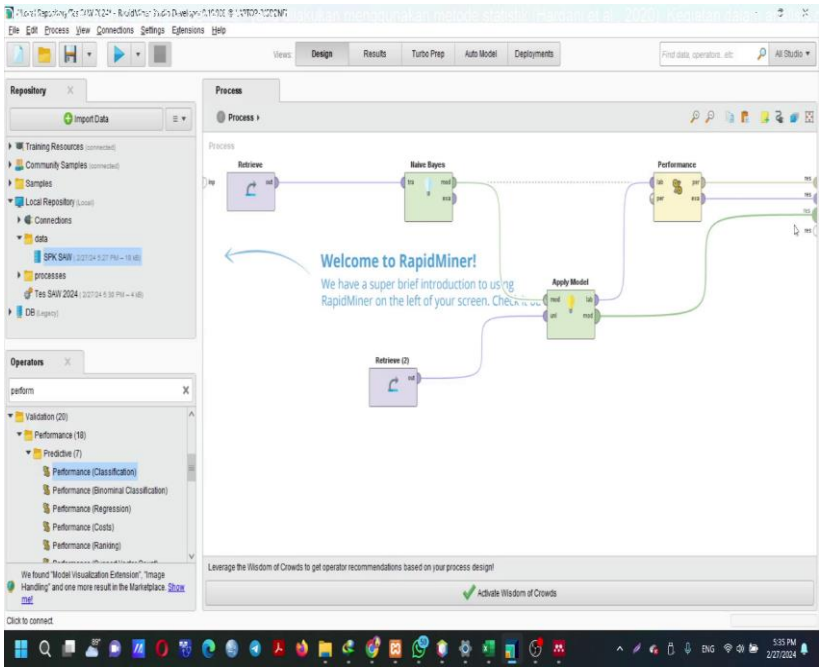


Figure 9

View After Connected With Lines

j. View Output Results

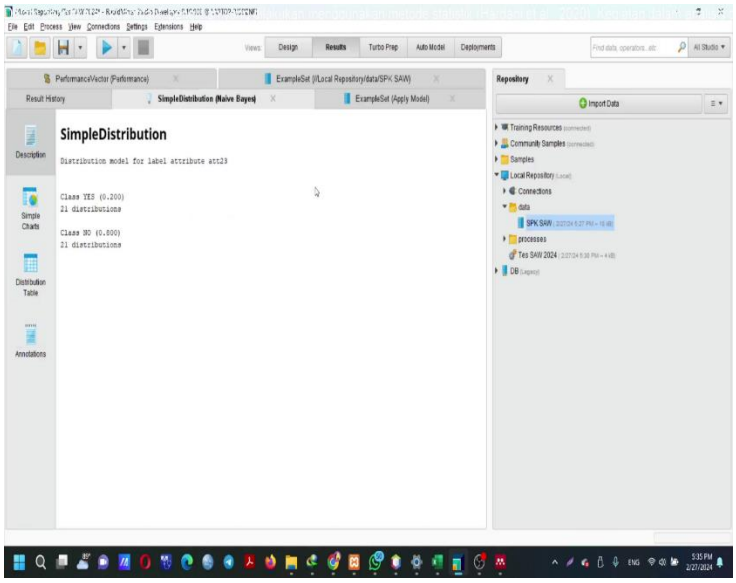


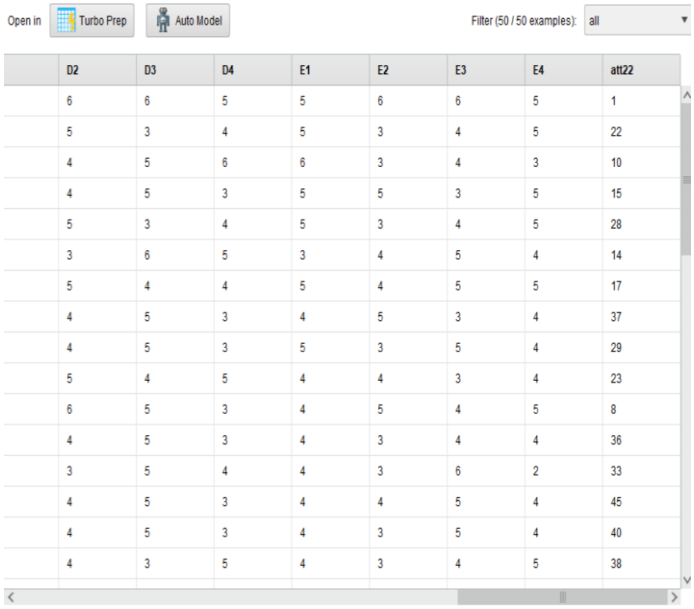
Figure 10
View After clicking run, the blue "play" button

Table View Plot View

accuracy: 98.00%

	true YES	true NO	class precision
pred. YES	10	1	90.91%
pred. NO	0	39	100.00%
class recall	100.00%	97.50%	

Figure 11
Display of Calculation Results in Rapid Miner

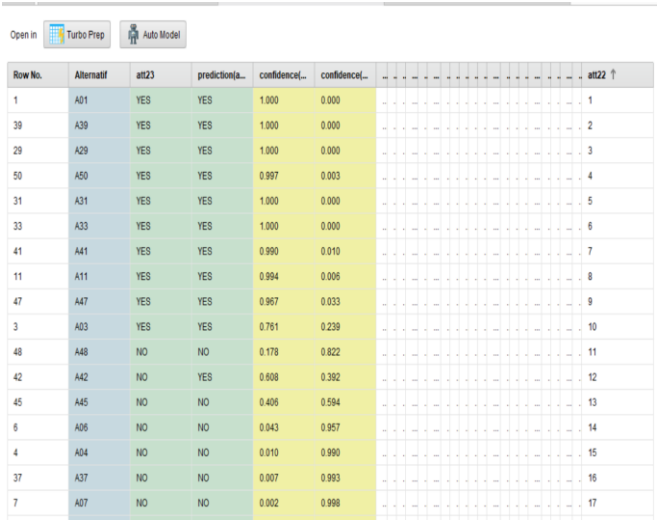


	D2	D3	D4	E1	E2	E3	E4	att22
	6	6	5	5	6	6	5	1
	5	3	4	5	3	4	5	22
	4	5	6	6	3	4	3	10
	4	5	3	5	5	3	5	15
	5	3	4	5	3	4	5	28
	3	6	5	3	4	5	4	14
	5	4	4	5	4	5	5	17
	4	5	3	4	5	3	4	37
	4	5	3	5	3	5	4	29
	5	4	5	4	4	3	4	23
	6	5	3	4	5	4	5	8
	4	5	3	4	3	4	4	36
	3	5	4	4	3	6	2	33
	4	5	3	4	4	5	4	45
	4	5	3	4	3	5	4	40
	4	3	5	4	3	4	5	38

Figure 12
Ranking Display On Rapid Miner

Output Results of Implementing the Simple Additive Weighting (SAW) Method in Excel and Rapid Miner

Output Results of Implementing the Simple Additive Weighting (SAW) Method on Rapid Miner in Determining Employee The Best of PT. Syntax Corporation Indonesia is:



Row No.	Alternatif	att23	prediction(a...	confidence(...	confidence(...	...	att22 ↑
1	A01	YES	YES	1.000	0.000	...	1
39	A39	YES	YES	1.000	0.000	...	2
29	A29	YES	YES	1.000	0.000	...	3
50	A50	YES	YES	0.997	0.003	...	4
31	A31	YES	YES	1.000	0.000	...	5
33	A33	YES	YES	1.000	0.000	...	6
41	A41	YES	YES	0.990	0.010	...	7
11	A11	YES	YES	0.994	0.006	...	8
47	A47	YES	YES	0.967	0.033	...	9
3	A03	YES	YES	0.761	0.239	...	10
48	A48	NO	NO	0.178	0.822	...	11
42	A42	NO	YES	0.608	0.392	...	12
45	A45	NO	NO	0.406	0.594	...	13
6	A06	NO	NO	0.043	0.957	...	14
4	A04	NO	NO	0.010	0.990	...	15
37	A37	NO	NO	0.007	0.993	...	16
7	A07	NO	NO	0.002	0.998	...	17

Figure 13
Display of Ranking of 10 Employees Best on Rapid Miner

Output Results of Implementing the Simple Additive Weighting (SAW) Method in Excel in Determining Employee Best PT. Syntax Corporation Indonesia.

Table 1
Ranking of 10 Employees Best on Excel

Employee Name	Total Normalized Value Weighted	Ranking
Saeful Anwar	0.182234	1
The Indi Millatul Maula	0.158712	2
Luthfiah	0.155138	3
Saona	0.153802	4
Muhammad Fahmi	0.153702	5
Regita Anggia Ningtyas	0.151824	6
Siti Munawaroh	0.14875	7
Father Surya	0.148705	8
Ita Lailasari	0.147195	9
Askarno	0.146791	10

The Simple Additive Weighting (SAW) method is one of the methods in the process of making a decision. This method has the ability more assessment precise and accurate because based on the value of the specified criteria and weights, that helps finish problem election employees achieve with fast and precise, and there is giving The criteria in this study are based on the standards used by CV. Syntax Corporation Indonesia, namely: Discipline, Achievement of work targets, Innovation, Sharing knowledge, and Competence. Each criterion The assessment in this study consists of 4 statement items, where based on results known data recap that mark lowest on the indicator Discipline is on item 1, namely, I always follow rules and regulations company related time work; value lowest on the indicator Job target achievement is on items 2 and 4, namely I have a clear understanding about job targets me and trying to achieve it with as good as possible and I adjust my work strategy I to fit in with goals and targets that have been set; value lowest on the indicator Innovation is in item 3, namely, I am active in providing new ideas and solutions innovative in solving the problem; value The lowest indicator for the Sharing Knowledge indicator is item 1, namely I am happy to share. Knowledge and experience I with colleague work; value lowest on the indicator Competence is on item 3, namely I can face complex challenges and solutions tasks that require skill special.

The steps taken in the Simple Additive Weighting (SAW) Method in determining a candidate employee best: To determine every criterion, give weight to each criterion, input data, perform data normalization, perform weighted data normalization and accumulation mark normalization weighted to know ranking employee based on the magnitude normalized total value-weighted.

Implementation results in Simple Additive Weighting (SAW) method in Rapid Miner and Excel in determining employee best PT. Syntax Corporation Indonesia has the

same result. Although there are differences in applying the Simple Additive Weighting (SAW) method between Rapid Miner and Excel, but No existing difference in the results evaluation of employee best. This indicates that The Simple Additive Weighting (SAW) method is a consistent method that cannot be influenced by the application in the implementation. The use of the Simple Additive Weighting (SAW) method in determining employee best PT. Syntax Corporation Indonesia is more efficient and effective when compared to with evaluation manually because the data input and data processing processes are carried out in a way computerized. In case steps are taken internally, evaluation criteria can be adjusted to Company needs.

Conclusion

The Simple Additive Weighting (SAW) method is one of the methods in the process of making a decision. This method can make the assessment precise and accurate, because based on the value of the specified criteria and weights, that helps finish problem election employees achieve fast and precise, and there is giving The criteria in this study are based on the standards used by CV. Syntax Corporation Indonesia, namely: Discipline, Achieving work targets, Innovation, Sharing knowledge, and competence.

Based on the implementation of the Simple Additive Weighting (SAW) method in determining the employee's best PT. Syntax Corporation Indonesia on the rapid miner and Excel applications is known that there is a difference in how to apply it, but although this matters there is no existence difference between candidate output results in employee best. This indicates that The Simple Additive Weighting (SAW) method can be used in various applications or different software.

Based on the results recapitulation questionnaire known that some items have marked lowest are: I always follow the company's rules and regulations regarding working hours; I have a clear understanding of my work targets and strive to achieve them as best I can; I adjust my work strategy to suit the goals and targets that have been set; I am active in providing new ideas and innovative solutions in solving problems; I am happy to share my knowledge and experience with colleagues; I can face complex challenges and complete tasks that require special skills.

Use the Simple Additive Weighting (SAW) method in determining the employee's best PT. Syntax Corporation Indonesia is more efficient and effective when compared to evaluation manually because the data input and data processing processes are carried out in a way besides that, the use of the Simple Additive Weighting (SAW) method in determining employee best can facilitate the assessment process employee Because No need peer review Work.

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