Access Level File using Simple Additive Weighting

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***Abstract*—For a company, knowing and understanding the behavior of employees in terms of accessing confidential company data is very important because it involves business interests in the future and if the company's data is leaked and disseminated, it can have a negative impact on the future of the company and that way too many employees do not know the level of access restrictions in the fileserver environment and also there is still no official data classification pattern established by the company, so the department has not fully known the pattern. For this reason, a management system tool will be created at PT Guentner Indonesia to detect and record data server data (especially those related to confidential files) to monitor activities carried out by all users with the aim of protecting company data from leaking until the company exits.**

Keywords-decision support system; simple additive weighting; access level.

I. INTRODUCTION

In the current era of information technology, data or information is a very valuable asset and must be protected. This was also followed by advances in computer technology. The advancement of computer technology helps all aspects of human life. From simple little things to very complicated things even if it can do by a computer. The advantage of this computer application is in addition to providing facilities for various data and information processing activities in various fields of life, for example, the use of computers in the fields of government, social organizations, military, banks, education, transportation, trade, industry, and so on. With the progress in information technology, communication, and computers, then a new problem arises, namely the problem of security of data and information and in this case will open opportunities for people who are not responsible for using it as a crime. And of course, it will harm the company [1].

Decision making is carried out with a systematic approach to the problem through the process of collecting data into information and coupled with factors that need to be considered in decision making. Decision support systems can be used as a consideration in certain decisions or policies, a flexible model that allows individuals or groups to form ideas and limit problems by making their own assumptions and producing desired solutions. But there are still those who use decision support systems manually so that they are not effective and unable to anticipate assessment subjectivity.

II. LITERATURE REVIEW

We began this research by first studying literature from research and other sources. the study discussed topics related to our research, including research on the algorithms that we will use.

Journal by Lisa Septian Putri with the title "Decision Support System Selection of Partner Freight Services using the Simple Additive Weighting (SAW) Method - Similarity to -deal Solution (TOPSIS) in the City of Malanga" [2] using several criteria, namely Fleet type, range, company experience, price, delivery time, and also packaging results. Based on the results of the design, implementation and testing and analysis that has been carried out on the decision support system for the selection of freight forwarding partners using the SAW-TOPSIS method, the results of accuracy between the actual results data and the system outcome data are 71.42%.

The second journal we review is the journal from Irfan Agus with the title "Supporting System for Decision on Acceptance and Assessment of Warehouse Employees with Web Applications" [3]. From the results obtained, the system can select prospective warehouse employees in accordance with the criteria desired, provide appreciation with a form of assessment to warehouse employees, and assist companies in developing the company with the acceptance and assessment system of warehouse employees.

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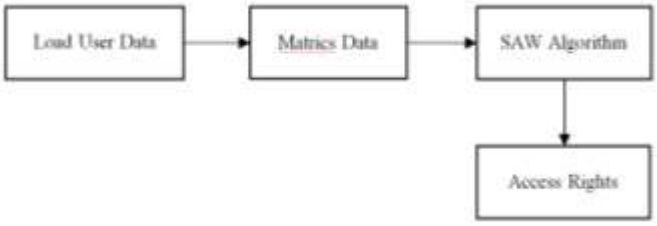

Figure 1. The flow of Determining Access Rights.

III. METHODOLOGY

In this study, the methodology that is used broadly using the SAW method with the basic concept of the SAW method is to find the weighted sum of performance ratings on each alternative in all attributes. The SAW method requires the decision matrix normalization process (X) to a scale that can be compared with all alternative existing ratings. Process diagram for determining access rights as in Figure 1.

The basic concept of the SAW method is to find the weighted sum of performance ratings on each alternative on all attributes. The first process is data collection, employee data and position must be obtained first so that the access rights level can be determined. Data is obtained from the database. Then the data that has been obtained is processed into table matrix data. The matrix table which contains the value of the criteria each determines the value of benefits and costs which will be used to determine the value of the normalization table. This normalization value will be processed with the SAW algorithm. The formula for normalization is as follows:

$$r_{ij} = \begin{cases} \dfrac{x_{ij}}{\max_{x_{ij}}} \\ \dfrac{\min_{x_{ij}}}{x_{ij}} \end{cases} \quad (1)$$

where: r_{ij} = Normalized performance rating

$\max_{x_{ij}}$ = Maximum value of each row and column

$\min_{x_{ij}}$ = Minimum value of each row and column

x_{ij} = Rows and columns of the matrix

with r_{ij} is the normalized performance rating of the Ai alternative to the c_j attribute; i = 1,2, ..., m and j = 1,2, ..., n. Preference values for each alternative (Vi) are given as:

$$V_i = \sum_{j=1}^{n} w_j r_{ij} \quad (2)$$

where: V_i = The final value of the alternative

w_j = Weight

r_{ij} = Normalization of the matrix

A larger V_i value indicates that Ai's alternative is preferred.

TABLE I. THE WEIGHT OF EACH CRITERION

Criteria	Weight
C1	5
C2	4
C3	3
C4	3
C5	2

TABLE II. VALUE OF EACH ALTERNATIVE IN POSITIONAL CRITERION

Level Position	Criteria				
	C1	C2	C3	C4	C5
A1 Presiden Director	5	5	5	5	5
A2 Manager	4	5	5	2	5
A3 SuperVisior	3	5	3	5	2
A4 Staff Spesial	3	5	2	4	2
A5 Staff Admin	2	3	3	2	1

TABLE III. ATTRIBUTES TABLE

Benefit Criteria	Cost Criteria
C1	C4
C2	
C3	
C4	

TABLE IV. MATRIX TABLE

Matrix Table					
	1	2	3	4	5
1	5	5	5	5	5
2	4	5	5	2	5
3	3	5	3	5	2
4	3	5	2	4	2
5	2	3	3	2	1

To begin the calculation with the SAW method, the first step that must be taken is to determine the criteria and weight of each. The weight value is the value of each criterion. Determination of the weight value depends on how high the access rights possessed by each position.

Of all the existing criteria, which criteria must be determined as part of the benefits, as well as the costs. Then the process of entering each value and criteria is carried out in a table so that a matrix table is obtained.

ISBN 978-602-53524-0-9

TABLE V. NORMALIZATION MAXIMUM VALUE

Normalization Value							
		Max Value	Result			Max Value	Result
R11	5	5	1	R21	5	5	1
R12	4	5	0,8	R22	5	5	1
R13	3	5	0,6	R23	5	5	1
R14	3	5	0,6	R24	5	5	1
R15	2	5	0,4	R25	3	5	0,6
		Max Value	Result			Max Value	Result
R31	5	5	1	R41	5	5	1
R32	5	5	1	R42	2	5	0,4
R33	3	5	0,6	R43	5	5	1
R34	2	5	0,4	R44	4	5	0,8
R35	3	5	0,6	R45	2	5	0,4

At this stage, the normalization process is carried out on all criteria, whether it is in the form of benefits or costs in the manner described above.

TABLE VI. NORMALIZATION MINIMUM VALUE

Normalization Value			
		Min Value	Result
R51	5	1	5
R52	5	1	5
R53	2	1	2
R54	2	1	2
R55	1	1	1

TABLE VII. MINIMUM AND MAXIMUM VALUE MATRIX

Normalization Factor of The Value that has been Obtained				
1	1	1	1	5
0,8	1	1	0,4	5
0,6	1	0,6	1	2
0,6	1	0,4	0,8	2
0,4	0,6	0,6	0,4	1

The value that has been obtained from the normalization process is entered into the table so that it can be easier for the next process. At this stage is the final stage where all normalization values are obtained by the weighting of each criterion.

TABLE VIII. FINAL SCORE

Final score	
V1	25
V2	22,2
V3	15,8
V4	14,6
V5	9,4

So that the biggest value is V1, so A1 gets the highest access rights with the position of President Director

Figure 2. Graph of file and folder access

IV. RESULT AND DISCUSSION

In implementing this system, users must first log in, log in so that such users can core system. If the user has logged in, Then a dashboard will appear from the application as shown in Figure 2. After logging in, employees can access data from the company, according to the level of access provided. For employees who access certain data, or what activities do employees do on the server or the system is all recorded and shown on the graphs in Figure 3.

Every employee's activities, both when accessing files, folder, modification or anything else on the server, well recorded and can be seen. As shown in Figure 4 can be seen in each username (employee)access any file, how many times, what files have been modified, etc. Regarding all activities of file and folder access from all employees of each department can be accessed from all department file access reports as shown in Figure 5.

Each department also has a folder separately on a server that can only be accessed by employees in the department. Not every department can randomly access folders from other departments. If that is still done, it will be recorded in the system and can be followed up from employee activities such as in Figure 6. Reports of each employee level access per department can be seen in Table IX in the report there is data such as department name, name employee, position, email address, and also what level of access received by each employee.

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Figure 3. Activity report for each employee

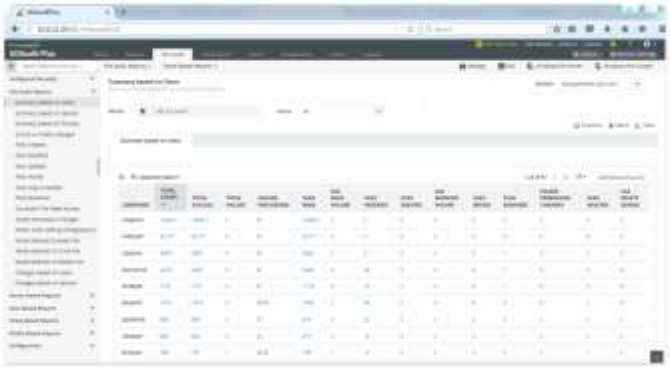

Figure 4. Web Application Home Page

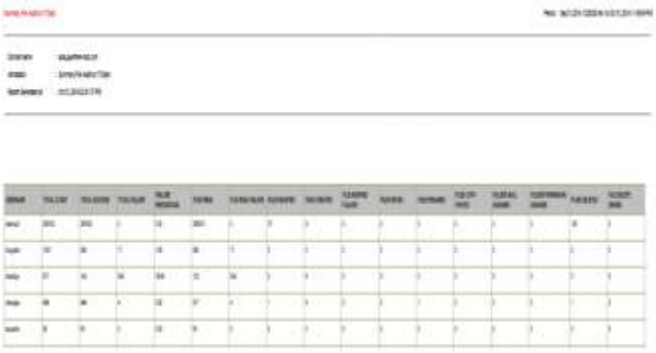

Figure 5. Folder provided for each department

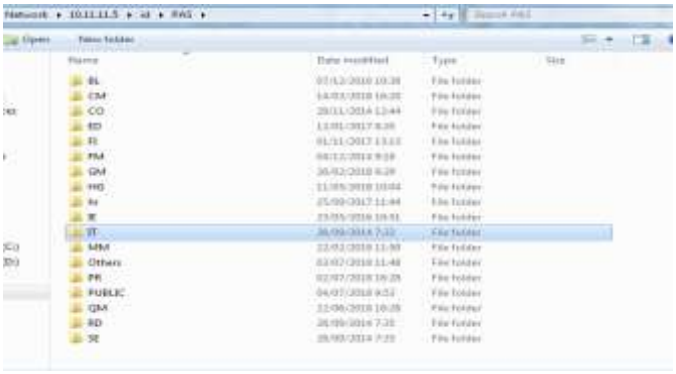

Figure 6. Summary of employee activity

TABLE IX. DEPARTMENT ACCESS LEVEL BASED ON PERSONAL CLASSIFICATION

Date : Dept :								
Personal Clsassification Review								
Number	**Department**	**Hostname**	**Account Name**	**Position**	**Email Addres**	**User Level**	**Access Level**	**Changes**
1	IT	IDPASN0083	Henry Winokan	Manager	henry.winokan@guentner.com	hwinokan	Level 4	
2	IT	IDPASN0024	Daru Nanjaya	Supervisor	daru.nanjaya@guentner.com	dnanjaya	Level 3	
3	IT	IDPASNE070	Aji Hendro Susanto	Specialist Staff	ajie.susanto@guentner.com	asusanto	Level 2	
4	IT	IDPASWB007	Ariyadi Gema Akbar	Administration Staff	ariyadi.akbar@guentner.com	aakbar	Level 1	
5	IT	IDPASWA253	Azizul Junaid	Specialist Staff	azizul.junaid@guentner.com	ajunaid	Level 2	
6	IT	IDPASN0086	Danang Hardiyanto	Specialist Staff	danang.hardiyanto@guentner.com	dhardiya	Level 2	
7	IT	IDPASWA252	Imam Wahyudi	Specialist Staff	imam.wahyudi@guentner.com	iwahyudi	Level 2	
8	IT	IDPASWB008	Kornelius Pison	Specialist Staff	kornelius.nugraha@guentner.com	knugraha	Level 2	
9	IT	IDPASN0085	Teguh Wahyudi	Specialist Staff	teguh.wahyudi@guentner.com	twahyudi	Level 2	

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V. CONCLUSION

Decision support systems built with the Simple Additive Weight method are successfully implemented in the system to process data in order to be able to issue whatever access is obtained by each position criterion. Based on the results of testing carried out by manual calculation, the accuracy of the system is 100%. so the system can produce the right decision.

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ISBN 978-602-53524-0-9