


## Decision support system for giving rewards to Asmika and Areka teachers using the saw method

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Article Info	ABSTRACT
<b>Keywords:</b> SPK, Rewards, Asmika and Areka's teachers.	Rewards are given to appreciate the work or performance of a person or team. Research was conducted to provide rewards to Asmika and Areka teachers using the SAW method. This research applies the SAW method where giving rewards often causes debate due to differences of opinion. So that the decision to give rewards can be made appropriately and by the criteria that have been set. Research Method, namely the survey research method, is a research method carried out using surveys or direct data collection from interested parties. The method used to analyze the data is the SAW method. This research aims to apply the SAW method in giving rewards to ASMIKA and AREKA teachers and to design and build a decision support system for giving rewards to ASMIKA and AREKA teachers. This research targets the results of the application for giving rewards to ASMIKA and AREKA teachers where the research results will be published in the Sinta journal. The results of the research on the application of the SAW method of giving rewards to Asmika and Areka teachers began with determining criteria, alternative, and Crips data as sub-criteria. Rewards are given if the results of the analysis of alternative data get a value $\geq 80$ . The research found the conclusion that one alternative received a reward, namely A4, while A1, A2, A3, and A5 had not yet received a reward. The SAW method can be applied to the process of giving rewards to Asmika and Areka teachers.
This is an open access article under the <a href="https://creativecommons.org/licenses/by-nc/4.0/">CC BY-NC</a> license 	<b>Corresponding Author:</b> Nera Mayana Br Tarigan Informatics Engineering, STMIK Pelita Nusantara, Medan City, North Sumatra, Indonesia <a href="mailto:neramayana658@gmail.com">neramayana658@gmail.com</a>

### INTRODUCTION

According to the Catholic Christian Sacred Tradition, the Catholic Church is the person and teachings of Jesus Christ (around 4 BC to around 30 AD), and the Catholic Church is a continuation of the Ancient Christian congregation formed by Jesus' disciples. The Catholic Church honors its bishops as the successors of Jesus' apostles and honors the Bishop of Rome as the sole successor of Saint Peter, the apostle who worked in the city of Rome in the first century AD after Jesus was appointed head of the Church. At the end of the 2nd century, bishops began holding regional councils to resolve various issues related to doctrine and policy. In the 3rd century, the Bishop of Rome began to become a kind of

supreme judge, settling matters that other bishops could not resolve. The Catholic Church in its theological understanding or doctrinal teachings regarding the concept of the Kingdom of God is different from Protestantism [1].

The Catholic Church is led by the Pope while the pope divides duties into each province which is led by the Bishop. The extension of the bishop of each province is led by the priest (parish priest). St. Catholic Church Paulus Ujung Serdang is one of the churches under the auspices of the Santo Yosep Parish Church, Tanjung Morawa rayon, which was founded in 1968 at Jl. Sibiru-blue No. 1 Lk. V, RT 002, RW 003 Delitua-20355. Since the founding of St. Paulus Ujung Serdang is still growing rapidly, this can be seen from the activities carried out by the church and from the number of Catholic families that have been registered with the Deli Tua parish.

The Ujung Serdang Catholic Church arranges a worship schedule every week, both during the celebration of the Eucharist Mass and the prayer service, with only one celebration, namely every 08.00 until the end. Sunday celebrations for ASMIKA and AREKA children are held before adult celebrations are held. ASMIKA and AREKA services are usually guided or led by MUDIKA or mothers who are willing to guide/coach ASMIKA and AREKA children. The duties of Sunday school teachers are to communicate the right things, serve, teach prayer, and sing [2]. However, with a task that is so noble and requires extra patience, churches often do not see the struggle of Asmika coaches or teachers which they have been carrying out for years with full responsibility and love.

In Sunday school children are divided into several groups [3] according to age such as Grade 0, Grade 1-2, Grade 3-4, and Grade 5-6. The struggle and service of the coaches and teachers of ASMIKA and AREKA should be an input to the church leadership, both from Forhangers and church administrators. Related to this, the author wants to research giving gifts to ASMIKA and AREKA coaches and teachers at St. Catholic Church. Paulus Ujung Serdang. This is solely to increase the enthusiasm of ASMIKA and AREKA teachers and coaches in guiding the Church's generation of children to be better and full of creativity to grow in the faith.

Decision support systems are part of computer-based information systems (including knowledge-based systems) that are used to support decision-making in an organization or company. In other words, it is a computer system that processes data into information to make decisions on specific semi-structured problems [4]. Some of the references for this research are researched by Gemawaty & Yuliani [5] and the results of selecting the best lecturers have been able to provide solutions to current problems. The SAW method is a valuable tool in solving the problem of selecting the best lecturers.

Syaputra's research [6] results from this research are the formation of a ranking from the highest value, namely 15.6, by the 7th alternative to the lowest by the 2nd alternative with a value of 8.7, making it easier for the assessment team to decide on the recruitment of appropriate educational staff. with the criteria set by the university.

Yulaikha's research [7] results from research shows that SPK is proven to be able to help companies (managers) in making decisions, especially in terms of selecting the best supplier based on predetermined criteria and alternatives. An accurate and easy-to-

understand method is the SAW method, proven by literature review articles in which the results and discussions have been described. Rusliyawati's research [8] results show that YouTube social media with a score of 0.888 is the social media recommended for use as a university business strategy.

Kusnadi & Dwiyanasyah's research [9] results from testing this research, it was concluded that the decision support system for accepting scholarships had been successfully developed and displayed rankings from the selection results of prospective scholarship recipients. Research by Yusuf & Bachtiar [10] The results of this research are the final results of calculations, the SAW method and WP method can be applied in assessing the performance of contract workers and produce the same ranking order, namely alternative workers. contract named A2 = Akmad Rosidi as the best alternative, followed by the other best alternatives A5, A1, A3, and A4.

Fadilah's research [11] shows that the AHP and SAW methods of employee recruitment using multi-criteria can reduce the process of high subjectivity and can produce accurate final scores in assessing job applicants, as well as helping companies in the employee recruitment process because the administrative data collection process for job applicants is carried out systematically. on line. By the application of the SAW method in several problems that are by our research topic, this research can apply the SAW method of giving rewards to ASMIKA and AREKA teachers.

## METHODS

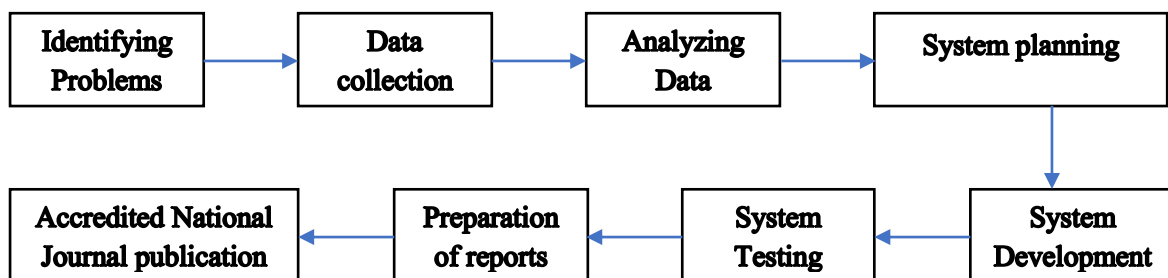


Figure 1. Research Stages

### Identifying Problems

Identifying problems is a way to find out what problems exist at St. Mary's Catholic Church. Paulus Ujung Serdang in giving rewards to ASMIKA and AREKA teachers.

### Data collection

Data collection comes from primary data and secondary data. Primary data in this research are ASMIKA and AREKA teacher data and criteria data. Secondary data is by searching for journals according to the research topic. Analyzing data using the SAW method.

### System planning

In system design, the stages describe the system design created using UML (Unified Modeling Language) modeling. The design of this system consists of Use Case Diagrams, Activity Diagrams and Class Diagrams, database design, and interface design.

### System Development

Development of a web-based system with PHP and MySQL as the database. The system development stages start with software requirements including input, process, and system output requirements. Next, build the system according to the design that has been determined at the system design stage so that it meets the expectations of the system design.

### System Testing

At the testing stage of the decision support system, namely by providing training to users with data obtained from the results of data collection. The system testing process is to prove that the application is by the initial design of the system that has been designed and has met the expected needs.

### Preparation of reports

At this stage, the researcher prepares a final research report to be submitted to LPMM STMIK Pelita Nusantara as a final accountability report by the schedule determined by LPMM STMIK Pelita Nusantara. In the final stage, the research output is the publication of a national journal with a SINTA accreditation rating.

## RESULTS AND DISCUSSION

### Data analysis

In this research, in the calculation process, the data used as sample data were taken directly from the Catholic Church of St. Paulus Ujung Serdang District. Tanjung Morawa District. Deli Serdang involving 6 criteria and 5 alternatives. The criteria for this research can be seen in Table 1.

**Table 1.** Criterion data

No	Criteria Code	Criterion Name	Attribute	Weight
1	C1	How to teach	benefits	25
2	C2	Creativity	benefits	20
3	C3	Patience guides	benefits	10
4	C4	Time availability	Cost	10
5	C5	Closeness to Children	benefits	15
6	C6	Length of work	benefits	20

The alternative in this research is to use 5 samples of Asmika teachers at the Catholic Church of St. Paulus Ujung Serdang. The alternatives in this research can be seen in table 2.

**Table 2.** Alternative Data

No	Asmika Teacher Code	Teacher's name is Asmika
1	A1	Anita Barus
2	A2	Irene Amelia Ginting
3	A3	Delvita Tarigan
4	A4	Loren Sianturi
5	A5	Rizwan Purba

**Table 3.** Crips Data

No	Criteria Code	Criterion Name	Crips	Mark
1	C1	How to teach	Very nurturing	100
2	C1	How to teach	Firm	75
3	C1	How to teach	Lack of confidence	50
4	C1	How to teach	Just normal	25
5	C2	Creativity	Always Provide Children's Creativity	100
6	C2	Creativity	Follow existing activities	75
7	C2	Creativity	Join in	50
8	C2	Creativity	Very Less Creative	25
9	C3	Patience guides	Very patient	100
10	C3	Patience guides	Be patient	75
11	C3	Patience guides	Impatient	50
12	C4	Time availability	Full time for each activity	100
13	C4	Time availability	Part time	50
14	C5	Closeness to Children	Very close	100
15	C5	Closeness to Children	Just normal	75
16	C5	Closeness to Children	Not enough	50
17	C6	Length of work	0-1 Years	25
18	C6	Length of work	1.1 Years - 3 Years	50
19	C6	Length of work	3.2 Years - 5 Years	75
20	C6	Length of work	Above 5 Years	100

Next, the SAW method calculation is carried out from the crips for each Asmika teacher, converted into weight crips as in the table below:

**Table 4.** The weight results have been converted

Alternative	Analysis Stage					
	C1	C2	C3	C4	C5	C6
A1	75	25	75	50	50	50
A2	100	50	75	100	75	75
A3	75	75	50	50	75	100
A4	75	100	75	100	100	75
A5	50	100	100	100	75	25

Normalization stages follow the formula below:

$$R_{ij} = \begin{cases} \frac{x_{ij}}{\max_i x_{ij}} & \text{If } j \text{ is the profit attribute (benefits)} \\ \frac{\min_i x_{ij}}{x_{ij}} & \text{If } j \text{ is a cost attribute (cost)} \end{cases}$$

Information:

benefits, each element is divided by the highest value from the matrix row  
cost, each element is divided by the lowest value of the matrix row.

1. Criteria How to teach

$$A1 = 75/100 = 0.75$$

$$A2 = 100/100 = 1$$

$$A3 = 75/100 = 0.75$$

$$A4 = 75/100 = 0.75$$

$$A5 = 50/100 = 0.50$$

2. Criteria Creativity

$$A1 = 25/100 = 0,25$$

$$A2 = 50/100 = 0,5$$

$$A3 = 75/100 = 0,75$$

$$A4 = 100/100 = 1$$

$$A5 = 100/100 = 1$$

3. Criteria for How to Guide

$$A1 = 75/100 = 0,75$$

$$A2 = 75/100 = 0,75$$

$$A3 = 50/100 = 0,5$$

$$A4 = 75/100 = 0,75$$

$$A5 = 100/100 = 1$$

4. Time availability

$$A1 = 50/100 = 0,5$$

$$A2 = 100/100 = 1$$

$$A3 = 50/100 = 0,5$$

$$A4 = 100/100 = 1$$

$$A5 = 100/100 = 1$$

5. Closeness to Children

$$A1 = 50/100 = 0,5$$

$$A2 = 100/100 = 1$$

$$A3 = 50/100 = 0,5$$

$$A4 = 100/100 = 1$$

$$A5 = 100/100 = 1$$

6. Long time working

$$A1 = 50/100 = 0,5$$

$$A2 = 75/100 = 0,75$$

$$A3 = 100/100 = 1$$

$$A4 = 75/100 = 0,75$$

$$A5 = 25/100 = 0,25$$

From the results of this analysis, normalization is obtained as in the table below:

**Table 5.** Normalization Table

Alternative	C1	C2	C3	C4	C5	C6
A1	0.75	0.25	0.75	0.5	0.5	0.5
A2	1	0.5	0.75	1	0.75	0.75
A3	0.75	0.75	0.5	0.5	0.75	1
A4	0.75	1	0.75	1	1	0.75
A5	0.5	1	1	1	0.75	0.25

The next stage is ranking Sunday school teachers (ASMIKA) by multiplying the normalized value for each criterion with the weight criteria in table 5.

$$A1 = (0,75 * 25) + (0,25 * 20) + (0,75 * 10) + (0,5 * 10) + (0,5 * 15) + (0,5 * 20)$$

$$= 18,75 + 5 + 7,5 + 5 + 7,5 + 10$$

$$A2 = (1 * 25) + (0,5 * 20) + (0,75 * 10) + (1 * 10) + (0,75 * 15) + (0,75 * 20)$$

$$= 25 + 10 + 7,5 + 10 + 11,25 + 15$$

$$A3 = (0,75 * 25) + (0,75 * 20) + (0,5 * 10) + (0,5 * 10) + (0,75 * 15) + (1 * 20)$$

$$= 18,75 + 15 + 5 + 5 + 11,25 + 20$$

$$A4 = (0,75 * 25) + (1 * 20) + (0,75 * 10) + (1 * 10) + (1 * 15) + (0,75 * 20)$$

$$= 18,75 + 20 + 7,5 + 10 + 15 + 15$$

$$A5 = (0,5 * 25) + (1 * 20) + (1 * 10) + (1 * 10) + (0,75 * 15) + (0,25 * 20)$$

$$= 12,5 + 20 + 10 + 10 + 11,25 + 5$$

From the above analysis, the normalization results are obtained in the table below:

**Table 6.** Normalization Results

Alternative	C1	C2	C3	C4	C5	C6
A1	18.75	5	7.5	5	7.5	10
A2	25	10	7.5	10	11.25	15
A3	18.75	15	5	5	11.25	20
A4	18.75	20	7.5	10	15	15
A5	12.5	20	10	10	11.25	5

Next, add up the scores of all the criteria for each Sunday School teacher (ASMIKA) as below:

$$A1 = 18,75 + 5 + 7,5 + 5 + 7,5 + 10$$

$$= 53,75$$

$$A2 = 25 + 10 + 7,5 + 10 + 11,25 + 15$$

$$= 78,75$$

$$A3 = 18,75 + 15 + 5 + 5 + 11,25 + 20$$

$$= 75$$

$$A4 = 18,75 + 20 + 7,5 + 10 + 15 + 15$$

$$= 86,25$$

$$A5 = 12,5 + 20 + 10 + 10 + 11,25 + 5$$

$$= 68,75$$

So that the final results obtained are like the table below:

**Table 7.** The final result

Alternative	Total value	Information
A1	53.75	Haven't received a reward yet
A2	78.75	Haven't received a reward yet
A3	75	Haven't received a reward yet
A4	86.25	Get Rewards
A5	68.75	Haven't received a reward yet

The information on the final results of the research on giving rewards to ASMIKA teachers at St. Paulus Ujung Serdang involving 6 criteria and 5 alternatives. So the teacher who is declared to have received the reward is the highest score. The highest score in this research was A4, namely 86.25. So it is stated that the standard reward for Sunday school teachers in 2024 is A4.

## CONCLUSION

The application of the SAW method for giving rewards to Asmika and Areka teachers begins with determining criteria data, alternatives, and Crips data as sub-criteria. Rewards are given if the results of the analysis of alternative data get a value  $\geq 80$ . The research found the conclusion that one alternative received a reward, namely A4, while A1, A2, A3, and A5 had not yet received a reward. The SAW method can be applied to the process of giving rewards to Asmika and Areka teachers.

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