Decision Support System Best Rider Si Penghubung Harapan (SPH) at Mini Station Tambaksari Ninja Express Surabaya

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A R T I C L E I N F O	ABSTRACT (9 PT)
	In the era of the industrial revolution 4.0, shipping services or expeditions have grown rapidly due to the increasing needs of people in online shopping. Ninja Express has facilitated several online stores or e-commerce and has many branches throughout Indonesia, one of which is the Tambaksari mini station. The Tambaksari mini station has several couriers who are tasked with delivering goods or what are called SPH riders (Si Penghubung Harapan). Every month there is a determination of the best SPH rider from each region based on the calculation of the performance of all SPH riders. The creation of this best rider SPH decision support system can facilitate the determination of the best SPH rider which was previously done manually. With the EXPROM II method, the system can compare several alternatives based on several established assessment criteria. The final calculation result is in the form of an alternative difference so that it can produce a ranking output based on the highest flow value. The implementation of this method is applied in web format using the PHP and MySQL programming languages.

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1.   INTRODUCTION

The development of technology in the modern era is currently very rapid and covers several fields, one of which is transportation. Transportation helps humans with mobility in their daily activities. Human activities in question such as the economy, delivery of goods and services, passenger transportation etc (S. Rohman and F. W. Abdul, 2021).

PT. Andiarta Muzizat known as Ninja Express, is one of the companies engaged in the field of goods delivery. The Ninja Express itself has several branches (hub stations) throughout Indonesia, one of which is the Tambaksari mini station located in Ploso Village, Tambaksari District, Surabaya City.

Each mini station at Ninja Express has a target for achieving package delivery which functions as an evaluation or assessment material for the performance of the mini station itself, including the Tambaksari mini station. Therefore, an HR management system is an important topic, considering that a good management system can affect the achievement of a company's targets (M. Masri, 2016). The Tambaksari mini station has several HR levels in its organizational structure as shown in Figure 1.
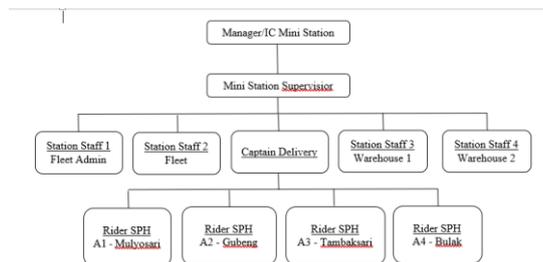
Figure 1. Organizational Structure of Tambaksari Mini Station

Based on Figure 1, there are several HR levels, one of which is the SPH rider. The SPH Rider (Si Penghubung Harapan) is a courier tasked with delivering packaging to customers. The SPH riders at the Tambaksari mini station are grouped into four4 delivery areas according to the coverage area of the mini station Mulyorejo, Gubeng, Tambaksari and Bulak. Every month, the SPH riders from each area recap th eir achievements based on the performance of the SPH riders themselves. With recent progress in SPH riders, the Tambaksari mini station has an HR management program to determine the best rider every month. The results of determining the best SPH rider are based on the recap of the achievements of each SPH rider each month.

The implementation of the best SPH rider determination program at the Tambaksari mini station has not been optimal. The calculation technique for the recap of SPH rider achievements has been done manually so far thus it is not considered objective. The purpose of this study is to create a bestrider SPH decision support system that can be used as a benchmark for producing the best rider SPH determination every month. The method used in this study is EXPROM II (The Extended Promethee) with a working system comparing one alternative with another and calculating the distance, the difference between paired alternatives to produce output, namely alternative ranking based on the highest flow value (N. Nurlela, M. Syahrizal, F. Fadlina, and A. B. Y. of T. E. P. I, 2020). The decision support system is created in a web format using the PHP programming language and with the help of the MySQL database.

2. RESEARCH METHOD

There are several stages of the method us ed in this study which are arranged in the research framework in Figure 2 below.
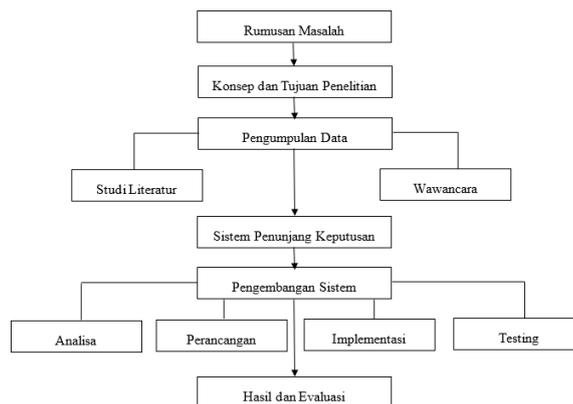

Figure 2. Research Framework

2.1. Data Collection

The data collection method used was a literature study which was then conducted by interviewing the manager or IC station of the Tambaksari mini station. The results of the data collection will later be in the form of overall data from SPH riders.

2.2. System Development

The system development method used wais the waterfall method which includes four4 stages analysis, design, coding (implementation), and testing. The flow diagram of the system development method is shown in Figure 3.

Analisa	→	Perancangan	→	Implementasi	→	Pengujian
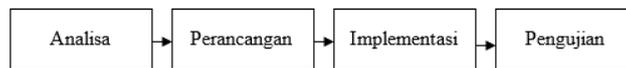
Figure 3. Flow diagram of waterfall method

2.3. Decision Support System

The decision support system or Decision Support System (DDS) is part of a computer-based information system that is used to support decision making in an organization or company [4].

2.4. The Extended Promethee II (EXPROM II)

Extended Promethee II (EXPROM II) is a method that compares the distances between relative pairs for each criterion. In this method, the relative value of one alternative is defined using two alternative indices. The first alternative index is the weakest preference index and the second is the strongest preference index. The results of the two alternative indices were obtained by calculating the ideal and antiideal values derived from the decision matrix [5]. A total preference index is then obtained which is the result of the calculation of the weakest and strongest preference indices. Subsequently, the net flow or net flow of each alternative is calculated based on the sum of the leaving and entering flows [5][6]. The final result of this method is an output in the form of an alternative ranking based on the highest net flow value [3]. The algorithm for the stages in completing the Decision Support System (DSS) with the EXPROM II method is as follows:

1. Create a decision matrix
   A decision matrix consists of alternative values (i) for each criterion (j)
2. Normalize the decision matrix
   For type of criterion (i) which has benefit value:

$$r_{ij} = \frac{[x_{ij} - \min(x_{ij})]}{[\max(x_{ij}) - \min(x_{ij})]} \quad (i=1,2,..,m; j=1,2,..,n) \tag{1}$$

   For type of criterion (i) which has a cost value:

$$r_{ij} = \frac{[\max(x_{ij}) - x_{ij}]}{[\max(x_{ij}) - \min(x_{ij})]} \tag{2}$$

   Where :
   r_{ij} : normalization matrix
   i : alternative
   j : criterion
3. Determine the preference function $P_j(i,i')$
   The preference function equation $P_j(i,i')$ is given by Equation (3):

$$P_{ij}(i,i')=0 \text{ if } r_{ij} \leq r_i'j$$
$$P_{ij}(i,i')=(r_{ij}-r_i'j) \text{ if } r_{ij} > r_i'j \tag{3}$$

   Where:
   P_{ij} : Preference function
   i : alternative
   i' : alternative to be paired
4. Calculating Weak Preference (WP)
   Weak Preference (WP) is derived from the calculation of the weak preference index by considering criteria with different weight values (w) for each criterion using equation (4):

$$WP(i,i')=[\Sigma w_j \times P_j(i,i) nj=1] \Sigma w_j nj=1/ \tag{4}$$

   Where :
   WP : Weak Preference
   n : number of criteria

wj : weight of criterion j

5. Calculating the value of SPj(i,i')

The SP value j(i,i') is the opposite of the WP value which is a strong preference function as shown in equation (5) below:

$$SPj(i,i')=[max(0,dj-Lj)]/[dmj-Lj] \tag{5}$$

Where :
SP : Strict Preference criterion j
dj : rij-ri'j
dmj : 1
Lj : 0

6. Calculating the Strict Preference (SP)

The calculation of the strong preference index uses the following equation (6):

$$SP(i,i')=[\Sigma wjxSPj(i,i')nj=1]/\Sigma wjnj=1 \tag{6}$$

7. Calculating the Total Preference (TP)

The Total Preference TP value is an equation for calculating the total preference index value as shown in Equation (7):

$$TP(i,i')=Min[1,WP(i,i')+SP(i,i')] \tag{7}$$

8. Calculating Entering and Lowering Flow

For the outward (positive) direction equation :

$$\varphi+(i)=1m-1\ \Sigma TP(i,i')(i\neq i')mi'=1 \tag{8}$$

For the incoming direction equation (negative) :

$$\varphi-(i)=1m-1\ \Sigma T\tilde{P}(i',i)(i\neq i')mi'=1 \tag{9}$$

Where :
m : number of alternatives

9. Calculating Net Flow

Net flow is the result of calculating the ranking flow (i) for each other alternative, the calculation is in equation (10):

$$\varphi(i)=\varphi+(i)-\varphi-(i) \tag{10}$$

10. Alternative ranking is taken based on the highest (i). The higher the value of (i), the better the alternative. Thus, the best alternative is the alternative that has the highest (i) value [7].

3.   RESULTS AND DISCUSSION

In this research, there are several stages of results and discussion, including:

3.1. Data collection

At this data collection stage, several data analyses were conducted during the literature study and interviews, including:

1. Delivery region data

The Tambaksari mini station covers four4 delivery areas based on the sub district names listed in Table 1.

Table 1. Delivery region data

Zona	Kecamatan
A1-Mulyorejo	Mulyorejo
A2-Gubeng	Gubeng
A3-Tambaksari	Tambaksari
A1-Bulak	Bulak

2. SPH rider data

There are several SPH riders at the Tambaksari mini station that are divided based on their delivery regions or areas as listed in Table 2.

Table 2. SPH rider data

Nama Rider	Zona
Abas Indarto	Mulyorejo
Angga	Mulyorejo

Coek Ariefianto	Mulyorejo
Moch Ridwan	Mulyorejo
Renditya	Mulyorejo
Trivansyah	Mulyorejo
Vigid	Mulyorejo
Zakaria	Mulyorejo
Zani Farhan	Mulyorejo
Abd Halim	Gubeng
Mario	Gubeng
Agung tri iko	Gubeng
Buddy Poerwanto	Gubeng
Firmanda	Gubeng
Rachmad Syaifudin	Gubeng
Yusuf	Gubeng
Robby Firmansyah	Gubeng
Risky Hartanto	Tambaksari
Adi Setiawan	Tambaksari
Ahmad Arif	Tambaksari
Eni Lestari	Tambaksari
Fernando arisanto	Tambaksari
Gedion Prasetyo Adi	Tambaksari
Hendy Kriswanto	Tambaksari
Mochammad Dwi	Tambaksari
Riki Eduard	Tambaksari
Sumarji	Tambaksari
Taufan Widayanto	Tambaksari
Widyarto Dwi Prasetyo	Tambaksari
Ahmad Bagus	Bulak
Hoirul	Bulak

3. Assessment criteria data

Four4 assessment criteria were used as benchmarks. Each criterion had an assessment weight according to the provisions explained in Table 3.

Table 3. Assessment criteria data

Kriteria	Bobot Penilaian
Produktivitas	30% (0,3)
Success rate	30% (0,3)
Komplain QR	20% (0,2)
Presensi	20% (0,2)

The definition of some of these criteria are:

a. Productivity is the total number of packages carried by SPH riders each month.

b. The success rate is the total percentage of success of the SPH riders in delivering packages to customers each month.

c. QR Complaints here are the total violations of SPH riders if there are complaints related to the performance of the SPH rider, both complaints from customers and the behavior (attitude) of the SPH rider each month. QR is an abbreviation for Quality Recovery (quality evaluation) of the rider.

d. Presence is the total number of working days (entry) for the SPH rider each month.

4. Assessment target data

For each assessment criterion several targets must be achieved by the SPH rider. The greater the target that can be achieved by each SPH rider, the better the assessment obtained by the SPH rider (benefit). Later, the targets that have been achieved by the SPH rider will be grouped based on a certain range and changed into fuzzy values. The assessment data for each criterion are presented in Tables 47.

Table 4. Target data on productivity criteria

Target	Nilai Fuzzy
<= 600	20
> 600 sampai <= 800	40
> 800 sampai <= 1000	60
> 1000 sampai <= 1200	80
> 1200	100

Table 5. Target data on success rate criteria

Target	Nilai Fuzzy
75%	20
> 75% sampai <= 85%	40
> 85% sampai <= 90%	60
> 90% sampai <= 95%	80
> 95%	100

Table 6. Target data on QR complaint criteria

Target	Nilai Fuzzy
>= 4	20
3	40
2	60
1	80
> 1200	100

Table 7. Target data on presence criteria

Target	Nilai Fuzzy
<= 5	20
> 5 sampai <= 10	40
> 10 sampai <= 15	60
> 15 sampai <= 20	80
> 20	100

3.2. Design Stage

The design stage was the next stage after data collection. This stage is divided into the following parts:

1. System Flowchart

This system flowchart describes the flow of the information system that will be created [8]. The following is a description of the system flowchart shown in Figures 48.
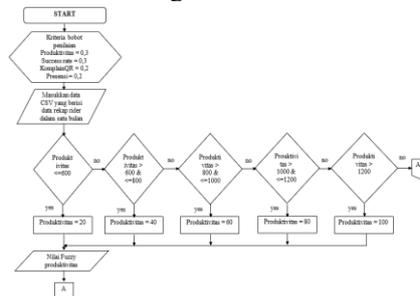
Figure 4. System Flowchart (1)
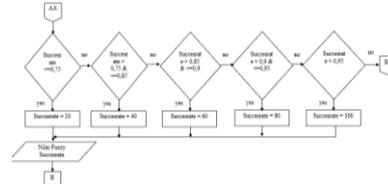
Figure 5. System Flowchart (2)
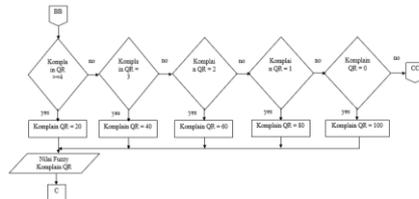
Figure 6. System Flowchart (3)
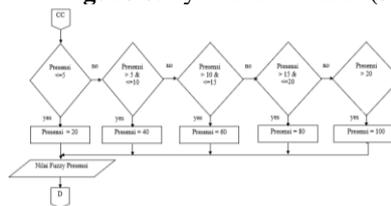
Figure 7. System Flowchart (4)
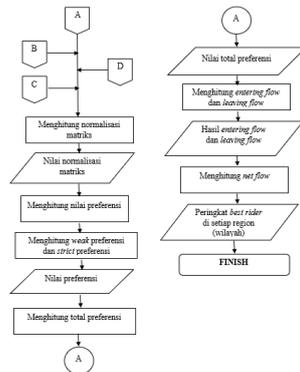
Figure 8. System Flowchart (5)

2. Data Flow Diagram (DFD)

Data Flow Diagram (DFD) is a flow diagram that describes a process in an information system. There are several levels in DFD however in this study, the creation of DFD only reaches three levels Context Diagram, Level 0 diagram (overview), and level 1 diagram [9]. The results of the DFD level design are shown in Figure 9-11
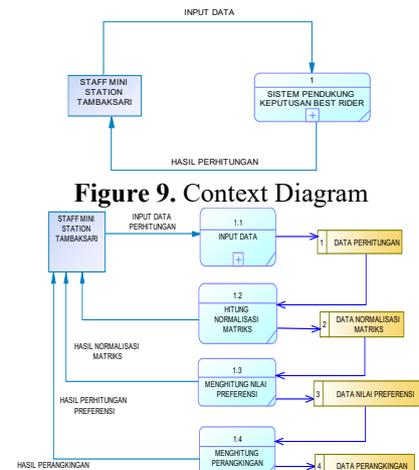
Figure 9. Context Diagram
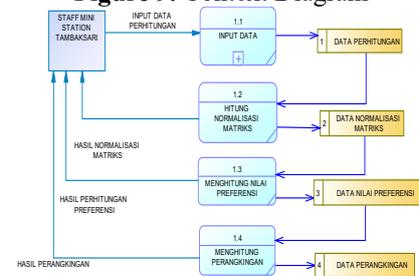
Figure 10. Level 0 diagram (overview)
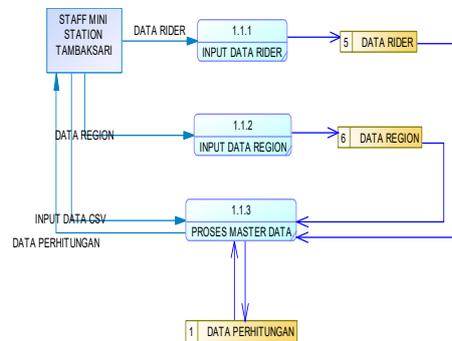
Figure 11. Level 1 diagram

3. Entity Relationship Diagram (ERD)

An Entity Relationship Diagram (ERD) is a design diagram that contains data or system modeling in a database. ERD itself contains several entities that will later be part of the database design of an information system [10]. The ERD design is shown in Figure 12.
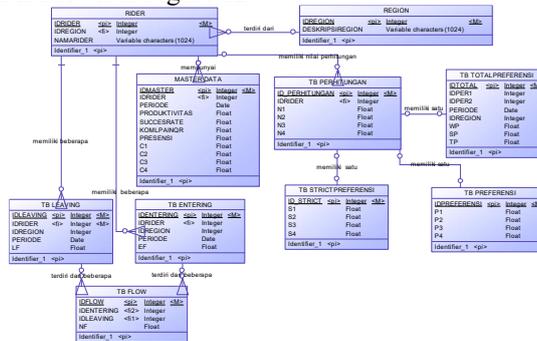
Figure 12. Entity Relationship Diagram (ERD)

4. Interface Design

The final design stage was the interface design. The results of the interface design are shown in Figure 13 – 21.

a. Homepage (dashboard)
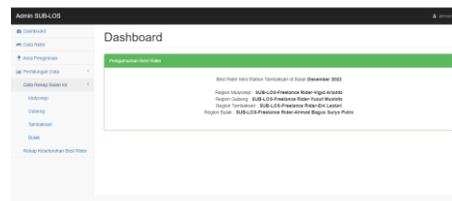
Figure 13. Homepage (dashboard)

b. SPH rider data page
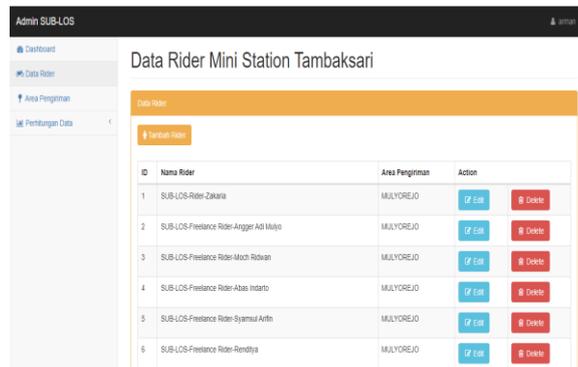
Figure 14. SPH rider data page

c. Region data page
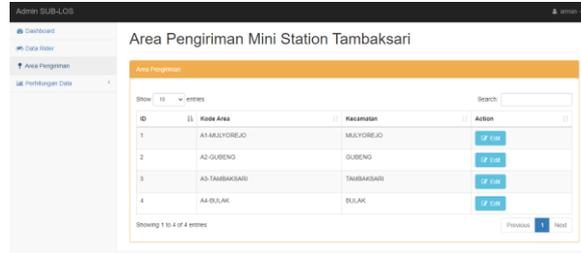
Figure 15. Region data page

d. This month's recap data page
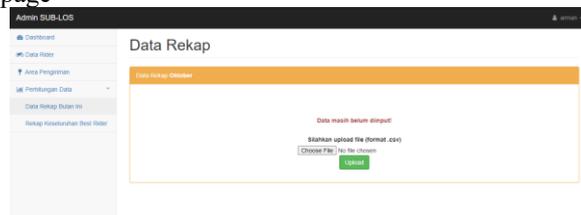
Figure 16. This month's recap data page (1)

On this month's recap data page, there are two types of display according to the state of the system. The first display is shown in Figure 16 which displays a file upload form in csv format. The second display is shown in Figure 17 which shows the recap data for this month in each region.
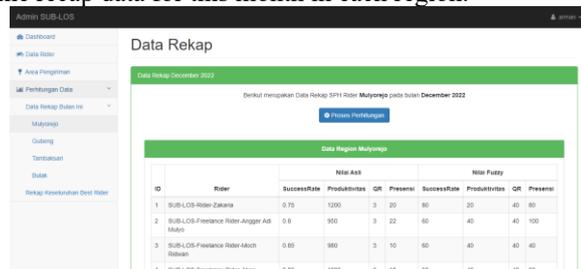
Figure 17. This month's recap data page (2)

e. Normalization results page
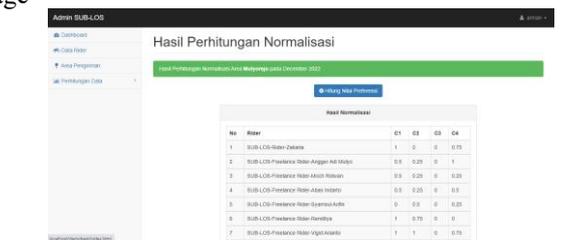
Figure 18. Normalization results page

f. Preference calculation results page
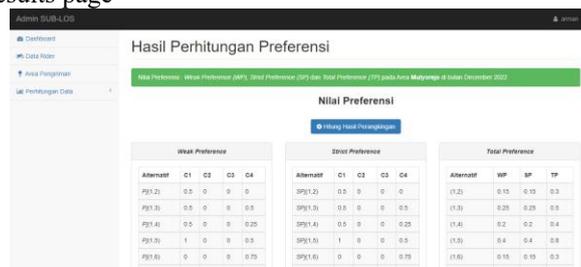
Figure 19. Preference calculation results page

g. Ranking results page
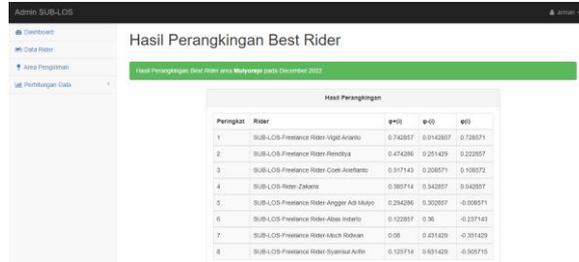
Figure 20. Ranking results page

h. Overall best rider recap page
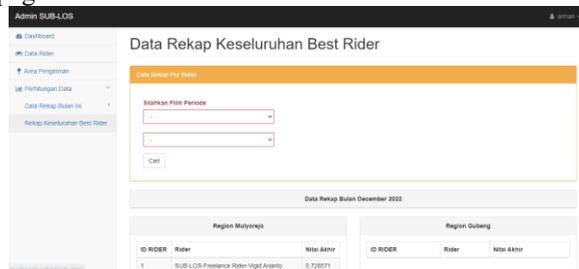
Figure 21. Overall best rider recap page

3.3. EXPROM II Implementation

The next stage was the implementation of EXPROM II on the sample data used. In this study, we used sample data from November 2022 in the Mulyorejo region. The sample data are presented in Table 8.

1. Data sample

The data sample in this study is divided according to the region or delivery area with the descriptions Pro (productivity), SR (Success Rate), KQ (QR Complaints), and Pre (presence)

Table 8. Sample data for Mulyorejo region

Rider	Pro	SR	KQ	Pre
Abas Indarto	97	0,91	0	2
Angga	545	0,94	3	8
Coek Ariefianto	624	0,92	0	10
Moch Ridwan	925	0,93	0	14
Renditya	753	0,93	0	11
Trivansyah	560	0,94	1	9
Vigid	729	0,96	0	11
Zakaria	1515	0,95	1	21
Zani Farhan	511	0,94	0	7

2. Changing the original value to a fuzzy value

After the sample data were inputted, the original value of each criterion was changed to a fuzzy value as shownin Figure 22.
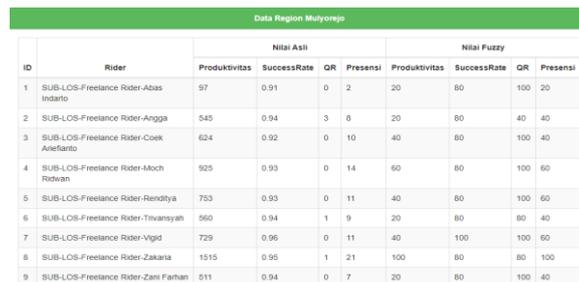

Figure 22. Fuzzy value of Mulyorejo region

3. Creating a decision matrix
After obtaining the fuzzy values, the next step is to create a decision matrix as shown in Figure 23.

$$
\begin{Bmatrix}
20 & 80 & 100 & 20 \\
20 & 80 & 40 & 40 \\
40 & 80 & 100 & 40 \\
60 & 80 & 100 & 60 \\
40 & 80 & 100 & 60 \\
20 & 80 & 80 & 40 \\
40 & 100 & 100 & 60 \\
100 & 80 & 80 & 100 \\
20 & 80 & 100 & 40
\end{Bmatrix}
$$

Figure 23. Mulyorejo decision matrix

4. Normalization of decision matrix
The results of decision normalization are shown in Figure 24.

	C1	C2	C3	C4
	$R_{11}:\frac{[20-20]}{[100-20]}=0$	$R_{12}:\frac{[80-80]}{[100-80]}=0$	$R_{13}:\frac{[100-40]}{[100-40]}=1$	$R_{14}:\frac{[20-20]}{[100-20]}=0$
	$R_{21}:\frac{[20-20]}{[100-20]}=0$	$R_{22}:\frac{[80-80]}{[100-80]}=0$	$R_{23}:\frac{[40-40]}{[100-40]}=0$	$R_{24}:\frac{[40-20]}{[100-20]}=0.25$
	$R_{31}:\frac{[40-20]}{[100-20]}=0.25$	$R_{32}:\frac{[80-80]}{[100-80]}=0$	$R_{33}:\frac{[100-40]}{[100-40]}=1$	$R_{34}:\frac{[40-20]}{[100-20]}=0.25$

$$
\begin{Bmatrix}
0 & 0 & 1 & 0 \\
0 & 0 & 0 & 0.25 \\
0.25 & 0 & 1 & 0.25 \\
0.5 & 0 & 1 & 0.5 \\
0.25 & 0 & 1 & 0.5 \\
0 & 0 & 0.67 & 0.25 \\
0.25 & 1 & 1 & 0.5 \\
1 & 0 & 0.67 & 1 \\
0 & 0 & 1 & 0.25
\end{Bmatrix}
$$

Figure 24. Normalization of the Mulyorejo region

5. Determining preference values
The next step is to determine the preference values for each region as shown in Figures 25.

	C1	C2	C3	C4
	$Ri1 - Ri'2 = 0 - 0 = 0$	$Ri1 - Ri'2 = 0 - 0 = 0$	$Ri1 - Ri'2 = 1 - 0 = 1$	$Ri1 - Ri'2 = 0 - 0.25 = 0$
	$Ri1 - Ri'3 = 0 - 0.25 = 0$	$Ri1 - Ri'3 = 0 - 0 = 0$	$Ri1 - Ri'3 = 1 - 1 = 0$	$Ri1 - Ri'3 = 0 - 0.25 = 0$
	$Ri1 - Ri'4 = 0 - 0.5 = 0$	$Ri1 - Ri'4 = 0 - 0 = 0$	$Ri1 - Ri'4 = 1 - 1 = 0$	$Ri1 - Ri'4 = 0 - 0.5 = 0$
	$Ri1 - Ri'5 = 0 - 0.25 = 0$	$Ri1 - Ri'5 = 0 - 0 = 0$	$Ri1 - Ri'5 = 1 - 1 = 0$	$Ri1 - Ri'5 = 0 - 0.5 = 0$
	$Ri1 - Ri'6 = 0 - 0 = 0$	$Ri1 - Ri'6 = 0 - 0 = 0$	$Ri1 - Ri'6 = 1 - 0.67 = 0.33$	$Ri1 - Ri'6 = 0 - 0.25 = 0$
	$Ri1 - Ri'7 = 0 - 0.25 = 0$	$Ri1 - Ri'7 = 0 - 1 = 0$	$Ri1 - Ri'7 = 1 - 1 = 0$	$Ri1 - Ri'7 = 0 - 0.5 = 0$
	$Ri1 - Ri'8 = 0 - 1 = 0$	$Ri1 - Ri'8 = 0 - 0 = 0$	$Ri1 - Ri'8 = 1 - 0.67 = 0.33$	$Ri1 - Ri'8 = 0 - 1 = 0$
	$Ri1 - Ri'9 = 0 - 0 = 0$	$Ri1 - Ri'9 = 0 - 0 = 0$	$Ri1 - Ri'9 = 1 - 1 = 0$	$Ri1 - Ri'9 = 0 - 0.25 = 0$

Figure 25. Calculation of Mulyorejo preference value

6. Calculating the Weak Preference (WP) value
After obtaining the preference value, the next step is to calculate the Weak Preference (WP) value or the Weak Preference index as shown in Figure 26.

Alternatif	WP
(1,2)	0.2
(1,3)	0
(1,4)	0
(1,5)	0
(1,6)	0.07
(1,7)	0
(1,8)	0.07
(1,9)	0
(2,1)	0.05
(2,3)	0
(2,4)	0
(2,5)	0
(2,6)	0
(2,7)	0

Figure 26. Mulyorejo WP Calculation

7. Calculating the SPj value (i,i')

Before calculating the original value of the (SP), we first determine the index value for each criterion. The results of the SP value calculations are shown in Figure 27.

C1	C2	C3	C4
$SPj(1,2) = (0 - 0)(1 - 0) = 0$	$SPj(1,2) = (0 - 0)(1 - 0) = 0$	$SPj(1,2) = (1 - 0)(1 - 0) = 1$	$SPj(1,2) = (0 - 0)(1 - 0) = 0$
$SPj(1,3) = (0 - 0)(1 - 0) = 0$	$SPj(1,3) = (0 - 0)(1 - 0) = 0$	$SPj(1,3) = (0 - 0)(1 - 0) = 0$	$SPj(1,3) = (0 - 0)(1 - 0) = 0$
$SPj(1,4) = (0 - 0)(1 - 0) = 0$	$SPj(1,4) = (0 - 0)(1 - 0) = 0$	$SPj(1,4) = (0 - 0)(1 - 0) = 0$	$SPj(1,4) = (0 - 0)(1 - 0) = 0$
$SPj(1,5) = (0 - 0)(1 - 0) = 0$	$SPj(1,5) = (0 - 0)(1 - 0) = 0$	$SPj(1,5) = (0 - 0)(1 - 0) = 0$	$SPj(1,5) = (0 - 0)(1 - 0) = 0$
$SPj(1,6) = (0 - 0)(1 - 0) = 0$	$SPj(1,6) = (0 - 0)(1 - 0) = 0$	$SPj(1,6) = (0.33 - 0)(1 - 0) = 0.33$	$SPj(1,6) = (0 - 0)(1 - 0) = 0$
$SPj(1,7) = (0 - 0)(1 - 0) = 0$	$SPj(1,7) = (0 - 0)(1 - 0) = 0$	$SPj(1,7) = (0 - 0)(1 - 0) = 0$	$SPj(1,7) = (0 - 0)(1 - 0) = 0$
$SPj(1,8) = (0 - 0)(1 - 0) = 0$	$SPj(1,8) = (0 - 0)(1 - 0) = 0$	$SPj(1,8) = (0.33 - 0)(1 - 0) = 0.33$	$SPj(1,8) = (0 - 0)(1 - 0) = 0$
$SPj(1,9) = (0 - 0)(1 - 0) = 0$	$SPj(1,9) = (0 - 0)(1 - 0) = 0$	$SPj(1,9) = (0 - 0)(1 - 0) = 0$	$SPj(1,9) = (0 - 0)(1 - 0) = 0$

Figure 27. Calculation of SP Mulyorejo index value

8. Calculating the Strict Preference (SP) value

After obtaining the SPj index value from each criterion, the next step was to calculate the SP value or the strongest preference index. The calculation results are shown in Figure 28.

Alternatif	SP
(1,2)	0.2
(1,3)	0
(1,4)	0
(1,5)	0
(1,6)	0.07
(1,7)	0
(1,8)	0.07
(1,9)	0
(2,1)	0.05
(2,3)	0
(2,4)	0
(2,5)	0
(2,6)	0
(2,7)	0

Figure 28. Mulyorejo SP Calculation

9. Calculating the Total Preference value TP(i,i')

The next step is to calculate the Total Preference (TP) which is the result of adding the Weak Preference (WP) and Strict Preference (SP) values. The calculation results are shown in Figure 29.

Alternatif	WP	SP	TP
(1,2)	0.2	0.2	0.4
(1,3)	0	0	0
(1,4)	0	0	0
(1,5)	0	0	0
(1,6)	0.07	0.07	0.14
(1,7)	0	0	0
(1,8)	0.07	0.07	0.14
(1,9)	0	0	0
(2,1)	0.05	0.05	0.1
(2,3)	0	0	0
(2,4)	0	0	0
(2,5)	0	0	0
(2,6)	0	0	0
(2,7)	0	0	0

Figure 29. Mulyorejo TP Calculation

10. Calculating Entering and Lowering Flow

After obtaining the Total Preference (TP) value, the next step was to calculate the entering and lowering flow values. The calculation results are presented in Fig 30.

Entering Flow	Leaving Flow
$\varphi +(A1) = \frac{1}{9-1} \times 0.68 = 0.085$	$\varphi -(A1) = \frac{1}{9-1} \times 3.38 = 0.4225$
$\varphi +(A2) = \frac{1}{9-1} \times 0.1 = 0.0125$	$\varphi -(A2) = \frac{1}{9-1} \times 5.08 = 0.635$
$\varphi +(A3) = \frac{1}{9-1} \times 1.4 = 0.175$	$\varphi -(A3) = \frac{1}{9-1} \times 2.72 = 0.34$
$\varphi +(A4) = \frac{1}{9-1} \times 2.96 = 0.37$	$\varphi -(A4) = \frac{1}{9-1} \times 1.1 = 0.1375$
$\varphi +(A5) = \frac{1}{9-1} \times 2.8 = 0.35$	$\varphi -(A5) = \frac{1}{9-1} \times 1.42 = 0.1775$
$\varphi +(A6) = \frac{1}{9-1} \times 0.36 = 0.045$	$\varphi -(A6) = \frac{1}{9-1} \times 3.36 = 0.42$
$\varphi +(A7) = \frac{1}{9-1} \times 6.44 = 0.805$	$\varphi -(A7) = \frac{1}{9-1} \times 0.82 = 0.1025$
$\varphi +(A8) = \frac{1}{9-1} \times 6.38 = 0.7975$	$\varphi -(A8) = \frac{1}{9-1} \times 1.44 = 0.18$
$\varphi +(A9) = \frac{1}{9-1} \times 0.78 = 0.0975$	$\varphi -(A9) = \frac{1}{9-1} \times 2.58 = 0.3225$

Figure 30. Mulyorejo entering and lowering flow values

11. Calculating Net Flow (NF)

The final step in this method is to calculate the net flow (NF) which is the reference for the best rider SPH ranking in each region. The calculation results are shown in Figure 31.

Alternatif	$\varphi+$	$\varphi-$	$\varphi(i)$
A1	0.257143	0.628571	-0.371428
A2	0.6	0.4	0.2
A3	0.857143	0.2	0.657143
A4	0.542857	0.228571	0.314286
A5	0.114286	0.657143	-0.542857
A6	0.114286	0.657143	-0.542857
A7	0.257143	0.4	0.142857
A8	0.714286	0.171429	0.542857

Figure 31. Mulyorejo NF Values

12. Alternative Ranking Results

The results of the best rider SPH ranking for the Mulyorejo region are shown in Figure 32.

Peringkat	Rider	$\varphi+(i)$	$\varphi-(i)$	$\varphi(i)$
1	SUB-LOS-Freelance Rider-Vigid	0.805	0.1025	0.7025
2	SUB-LOS-Freelance Rider-Zakaria	0.7975	0.18	0.6175
3	SUB-LOS-Freelance Rider-Moch Ridwan	0.37	0.1375	0.2325
4	SUB-LOS-Freelance Rider-Renditya	0.2375	0.1775	0.06
5	SUB-LOS-Freelance Rider-Coek Arieflanto	0.175	0.2275	-0.0525
6	SUB-LOS-Freelance Rider-Zani Farhan	0.0975	0.3225	-0.225
7	SUB-LOS-Freelance Rider-Abas Indarto	0.085	0.4225	-0.3375
8	SUB-LOS-Freelance Rider-Trivansyah	0.045	0.42	-0.375
9	SUB-LOS-Freelance Rider-Angga	0.0125	0.635	-0.6225

Figure 32. Mulyorejo best rider SPH ranking

4.   CONCLUSION

Based on the results and discussions that have been written, the application of the EXPROM II method in this study has proven successful by calculating the weight value for ranking each criterion owned by the best rider SPH candidate by carrying out several stages of equations to obtain maximum and accurate results.

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