IMPLEMENTATION OF THE PREFERENCE SELECTION INDEX (PSI) METHOD IN COURIER PARTNER RECRUITMENT

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Abstract: One of the keys to the success of a company or agency in achieving certain goals is the workforce. However, finding the ideal partner that suits the needs of the organization or agency is difficult. Therefore, the selection of suitable potential partners is very important in order to be able to recruit partners who are competent in their fields and meet the company's expectations and meet all stages carried out by the organization. The Preference Selection Index method is the method used in selecting employees. The option that returns the highest Preference Index value after all criteria and alternatives have been calculated is the best option, or options selected. Based on research findings, Andreyanto Wijaya's alternative is the best alternative to be chosen as the company's partner with the highest score, which is 0.95346.

Keywords : decision support system; PSI; recruitment; partner

Abstrak: Salah satu kunci keberhasilan suatu perusahaan atau instansi dalam mencapai tujuan tertentu adalah tenaga kerjanya. Namun, menemukan Mitra ideal yang sesuai dengan kebutuhan organisasi atau instansi memang sulit. Oleh karena itu, pemilihan calon Mitra yang sesuai sangatlah penting agar dapat merekrut mitra yang berkompeten di bidangnya dan memenuhi harapan perusahaan serta memenuhi seluruh tahapan yang dilakukan oleh organisasi. Metode Preference Selection Index adalah metode yang digunakan dalam menseleksi pegawai. Pilihan yang menghasilkan nilai Indeks Preferensi tertinggi setelah semua kriteria dan alternatif dihitung adalah pilihan terbaik, atau pilihan yang terpilih. Berdasarkan temuan penelitian, alternatif Andreyanto Wijaya merupakan alternatif terbaik untuk dipilih menjadi mitra untuk perusahaan dengan skor tertinggi yaitu 0,95346.

Kata Kunci : sistem pendukung keputusan; PSI; rekrutmen; mitra

INTRODUCTION

Rapid advances in research and the growing complexity of information technology increase the speed and efficiency of data processing. Information technology plays an important role in improving the performance standards of an institution[1]. Its application automates the process of information access and increases the accuracy, speed, and completeness of integrated systems [2]. Humans use a lot of sophisticated equipment today, especially in the field of information technology. The world has become easier along with the advancement of information technology, and it has been proven that long-term working mechanisms have increased in effective-

ness and efficiency with the help of computer technology [3].

The company named PT. Jetindo Nagasakti Transekspress or (J&T Express) provides document and package delivery services. The company is a new business that utilizes IT to provide its services. Because of the advantages offered compared to other shipping services, many users choose and use PT. Jetindo Nagasakti Transeskspress. Human resources (HR) owned by employees or partners are the most important thing in a business. One of the factors that determine the success of a company in working is the management of its human resources. This presents its own challenges for employers in choosing the best workers because it is difficult to decide whether a worker deserves a position in the company. This problem can be solved by building a Decision Support System application.

This decision support system uses the PSI (Preference Selection Index) method, which is a method of making decisions based on several types of criteria without calculating the weight on attributes. Each alternative is calculated in relation to each criterion, and the option with the highest Preference Index value is the best choice. When there is a conflict of values, this method is helpful in knowing how important each employee or alternative is in relation to the criteria [4].

The selection of the Preference Selection Index method is the right decision where the method is able to make a simple calculation process, so that the method is very feasible to be used in the case study to be studied, with this method the company is more helped by the decision support system so that the chosen method will be feasible to use, because

many previous studies have used the method and are considered successful.

Previous research by Widya Indah Safitri &; Friendly &; Sarwandi (2022) by applying the same method, namely the Preference Selection Index (PSI) method entitled "Application of the Preference Selection Index (PSI) Method in IT Staff Admission". Using the PSI method to calculate the most appropriate alternative, it was found that option A9 was the best option to choose as the company's IT Staff with the highest score of 0.9624 [5].

Previous research above, using this method is proven to solve the problem of selecting IT staff according to company criteria, so the author chose this method in courier partner recruitment research at PT. Jetindo Nagasakti Transekspress Perdagangan city branch. in terms of courier partner recruitment at PT. Jetindo Nagasakti Transekspress Perdagangan city branch previously had many stages when choosing partners according to company criteria, where leaders had to do manual whining such as sorting one by one courier partner recruitment data that had been assessed previously.

From these problems, it is very useful to create a decision support system to help companies simplify work and be more efficient in the partner recruitment process, so that researchers will create a decision support system using the Preference Selection Index (PSI) method in recruiting courier partners at PT. Jetindo Nagasakti Transekspress Perdagangan city branch, with the aim that companies can select employees only with a web-based SPK system to determine employee recruitment in the company.

METHOD

The research method has a tahaan where each process is carried out periodically, so that the stages of the research process can be seen as follows:
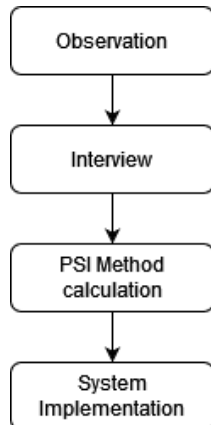

Image 1. Stages of Research

Each process in the research phase is described as follows:

Observation

Observation is the process of observing and recording behavior with the goal of generating guidelines, management, and other services [6]. Observing means paying attention, observing intensively, and focusing on one particular part or whole[7].

Interview

Through questioning, the researcher and informant or research subject communicate or interact to gather information at the time of the interview[8]. In the data collection process carried out at PT. Jetindo Nagasakti TransEkspress Perdagangan City branch, interviews were conducted to collect data directly by conducting questions and answers with related parties [9]. By including questions and answers directly to branch office leaders, the data obtained is in the form of data on prospective partners who apply for the company.

Preference Selection Index *(PSI)* Method

A rarely used Decision Support System, the Preference Selection Index (PSI) was created by Stevanie and Bhat to handle Multi-Criteria Decision Making (MCDM).[10]. The result can then be calculated using only static concepts, thus negating the need for attribute weights. [11]. You will be able to objectively determine the weight of the criterion using the method of entropy or standard deviation.[12]. The calculation formula for the Preference Selection Index (PSI) method is as follows:

1. Creating a Decision Matrix

In this step, a matrix characterizing the characteristics of the problem is created using all currently available information.

$$X_{ij}=\begin{matrix} 1 & 2 & 3 & \cdots & \cdots & \cdots & N\,Attribute \end{matrix}$$
$$X_{ij}=\begin{bmatrix} X_{11} & X_{12} & X_{13} & \dots & \dots & X_{1N} \\ X_{21} & X_{22} & X_{23} & \dots & \dots & X_{2N} \\ X_{31} & X_{32} & X_{33} & \dots & \dots & X_{3N} \\ \dots & \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots & \dots \\ X_{M1} & X_{M2} & X_{M3} & \dots & \dots & X_{MN} \end{bmatrix} \begin{matrix} 1 \\ 2 \\ 3 \\ \dots \\ \dots \\ M \end{matrix} \quad (1)$$

Description of formula 1 in this explanation. Xij is the initial decision matrix of the I-th alternative with j-criteria. The letter m in the Xij matrix is the number of alternatives to selection and n in the Xij matrix is the number of attributes.

2. Normalize matrix values

Dimensionless attribute values must be created using multi-attribute decision-making techniques.

$$N_{ij} = \frac{X_{ij}}{X_j^{max}} \quad (2)$$

Description of formula 2 in this explanation. *Xj max* in the decision matrix is a benefit formula. This section is the stage of normalization of decisions.

$$N_{ij} = \frac{x_j^{min}}{x_{ij}} \tag{3}$$

Description of formula 3 in the following explanation. The cost formula where the attribute is of unfavorable type, then a smaller value is desired, can use formula 3.

3. Calculate the average of normalized values

$$N = \frac{1}{n} \sum_{i=1}^{n} N_{ij} \tag{4}$$

Description of formula 4 in this explanation. Finding the mean value of normalized data means finding the average value of the matrix of each attribute.

4. Calculate preference variation values

$$\phi_j = \sum_{i-1}^{n} \left[N_{ij} - N \right]^2 \tag{5}$$

Description of formula 5 in this explanation. Calculates the preference variation value by summing the multiplication of the normalized matrix row elements by the corresponding preference weights of the column matrix elements.

5. Specify values in preferences

$$\Omega_j = \left[1 - \phi_j \right] \tag{6}$$

Description of formula 6 in this explanation. The number of each column in the matrix Ωj minus 1 corresponds to the number of columns present. After that, the number of calculation results in each column of the matrix Ωj.

6. Calculate criteria weight value

$$\omega_j = \frac{\Omega_j}{\sum_{j=1}^{m} \Omega_j} \qquad \sum_{j=1}^{m} \Omega_j = 1 \tag{7}$$

Description of formula 7 in this explanation. Determine the weight criterion according to formula 7. By dividing the sum of each column in the matrix Ωj by the sum of all columns $\sum \Omega j$.

7. Calculate preference selection values

$$\theta_i = \sum_{j=1}^{M} X_{ij.\omega_j} \tag{8}$$

Description of formula 8 in this explanation. Specifies the preference selection index, where the normalized X_{ij} matrix is multiplied by the result Ωj. After the multiplication is successful, the next step is the addition of each row in the Θi matrix. The result of summing each row in the matrix is the final result.

8. For specific applications, select the appropriate alternative: To assist managers in understanding the results, each option is then ranked up or down. The first rank will be achieved by the option with the highest preference selection index, and so on.

RESULTS AND DISCUSSION

At this stage is the result of calculations and all processes that have been carried out, where the calculation uses the method discussed earlier, namely using the Preference Selection Index (PSI) method with the calculation of the value of each criterion weight which is then calculated to get the highest preference value results.

Alternative Data

Table 1. Primer Data

No	Name	C1	C2	C3	C4
1	Andreyanto Wijaya	Very Good	Good	Very Good	Very Good
2	Bagas Dwi Prayoga	Good	Little Good	Good	Good
3	Ferry Ira-wan	Good	Good	Good	Good
4	M Rizal Arifin	Little Good	Very Good	Good	Fair
5	M Setiawan Syahputra	Good	Good	Good	Fair

In table 1 are the original data obtained from the company, after observing and collecting data directly to the company.

Determine assessment criteria, subcriteria and weights

This choice is based on the standards governing recruitment at PT. Jetindo Nagasakti TransEkspress Branch City Perdagangan.

Table 2. Criteria Table

Criteria Code	Criteria Name	Type
C1	Computer ability	Benefit
C2	Android Ability	Benefit
C3	Region Ability	Benefit
C4	Interview Result	Benefit

Table 3. Table of Sub-Criteria and Weights of Assessment

Sub Criteria	Weight
Very Good	5
Good	4
Fair	3
Little Good	2
Bad	1

Manual Calculation Steps of *the Preference Selection Index Method*

In this step, manual calculations are performed using formulas from predetermined methods.

Decision Matrix

A decision matrix based on alternate value conversion data looks like this:

$$Nij = \begin{bmatrix} 5 & 4 & 5 & 5 \\ 4 & 2 & 4 & 4 \\ 4 & 4 & 4 & 4 \\ 2 & 5 & 4 & 3 \\ 4 & 4 & 4 & 3 \end{bmatrix}$$

After the matrix is formed, determine its maximum and minimum values.

Normalization of matrix values

The overall normalization of alternative values based on different types of criteria is as follows:

C1
$N11 = 5/5 = 1$
$N21 = 4/5 = 0.8$
$N31 = 4/5 = 0.8$
$N41 = 2/5 = 0.4$
$N51 = 4/5 = 0.8$

C2
$N12 = 4/5 = 0.8$
$N22 = 2/5 = 0.4$
$N32 = 4/5 = 0.8$
$N42 = 5/5 = 1$
$N52 = 4/5 = 0.8$

C3
$N13 = 5/5 = 1$
$N23 = 4/5 = 0.8$
$N33 = 4/5 = 0.8$
$N43 = 4/5 = 0.8$
$N53 = 4/5 = 0.8$

C4
$N14 = 5/5 = 1$
$N24 = 4/5 = 0.8$
$N34 = 4/5 = 0.8$
$N44 = 3/5 = 0.6$
$N54 = 3/5 = 0.6$

Calculating the average value of the normalization matrix

The following results can be obtained by summing the average values of each matrix   attribute:
$\sum n\,1 = 1Nij = [3.8 , 3.8 , 4.2 , 3.8]$

Determine the average value of the results obtained from the

search and calculations, in particular:

$$N = \frac{1}{n}\sum_i^n = Nj\,1 = \frac{1}{5}X\ 3.8 = 0.76$$

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$$N = \frac{1}{n}\sum_i^n = Nj\,1 = \frac{1}{5}X\ 4.2 = 0.84$$

$$N = \frac{1}{n}\sum_i^n = Nj\,1 = \frac{1}{5}X\ 3.8 = 0.76$$

Calculate preference variation values

Next, the result of the value rank variation ($\emptyset$j) is calculated, and the resulting value is then compared with the desired variation as follows:
$\emptyset$j = [0.192 , 0.192 , 0.032 , 0.112]

Specify values in preferences

The results of the reduction in preference value include:

$\Omega 1 = 1 - 0.192 = 0.808$
$\Omega 2 = 1 - 0.192 = 0.808$
$\Omega 3 = 1 - 0.032 = 0.968$
$\Omega 4 = 1 - 0.112 = 0.888$
$\sum \Omega j = 0.808+0.808+0.968+0.88 = 3.472$

Determining the weight of criteria

Determine the weight of the criteria using the formula above, namely:

$$Wj = \frac{\Omega j}{\sum_{i=1}^{n}\Omega j} = \frac{0.808}{3.472} = 0.2327$$

$$Wj = \frac{\Omega j}{\sum_{i=1}^{n}\Omega j} = \frac{0.808}{3.472} = 0.2327$$

$$Wj = \frac{\Omega j}{\sum_{i=1}^{n}\Omega j} = = \frac{0.968}{3.472}\ 0.2788$$

$$Wj = \frac{\Omega j}{\sum_{i=1}^{n}\Omega j} = \frac{0.888}{3.472} = 0.2558$$

Calculating Preference Values

The result of the matrix multiplication calculation $\emptyset_j$ is as follows:

Table 4. Preference Value Results

Alternative	Mark
Andreyanto Wijaya	0.95346
Bagas Dwi Prayoga	0.70692
Ferry Irawan	0.8
M Rizal Arifin	0.7023
M Setiawan Syahputra	0.74884

From table 4 Apply a predefined formula to get the largest index preference value.

Determining Ranking

Table 5. Preference Selection Index Method Results

Alternative Rank	Mark	Rank
Andreyanto Wijaya	0.95346	1
Ferry Irawan	0.8	2
M Setiawan Syahputra	0.74884	3
Bagas Dwi Prayoga	0.70692	4
M Rizal Arifin	0.7023	5

Based on comprehensive calculations, it was determined that the recruitment candidate was ranked 1st with the name Andreyanto Wijaya with a value of 0.95346.

System Implementation

The appearance of the application that has been implemented is as follows, specifically:
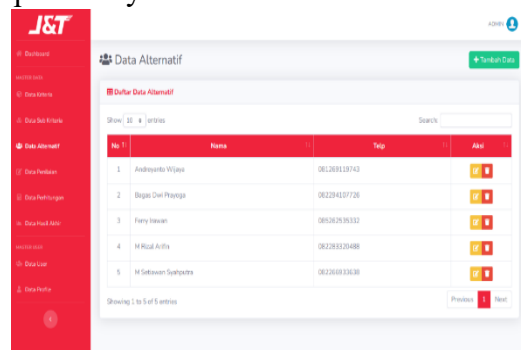

Image 2. Alternate Data Form Display

In Image 2, this page will display options or information about partners who are applying or who will be hiring new staff members for the business.

Image 3. Cracking Page View

In Image 3, it is a page displaying alternative data that has been whined, and has been sorted by its highest preference value.

CONCLUSION

PT. Jetindo Nagasakti TransEk-spress Kota Perdagangan Branch implements a recruitment process based on pre-set standards, including computer skills, Android Mastering, understanding of the area, and interview results. To create a Courier Partner Recruitment Decision Support System using the PSI method, alternative data must be collected first, then converted according to each predetermined category, then calculated using the method. The results in the system are in accordance with the manual results which include an alternative named Andreyanto Wijaya with a first rank value with a value of 0.95346 based on the results of calculations carried out using the Preference Selection Index method.

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