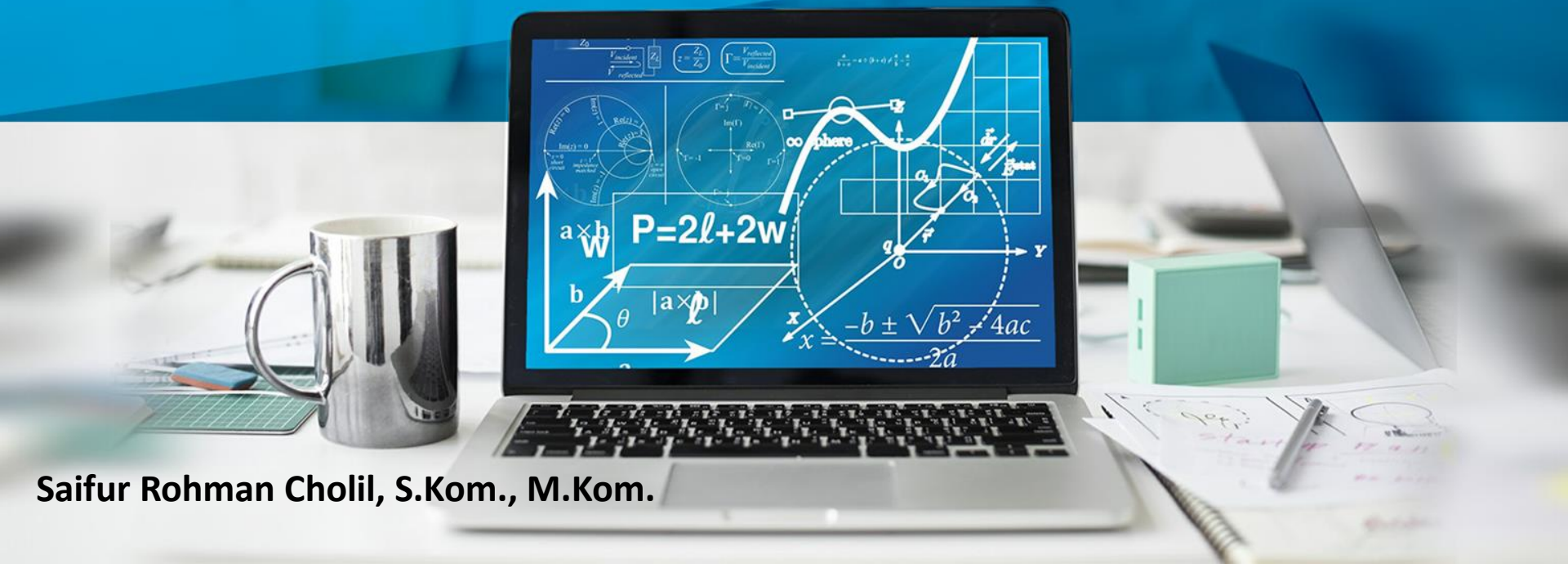
METODE PSI

(Preference Selection Index)



Saifur Rohman Cholil, S.Kom., M.Kom.

- Metode Preference Selection Index (PSI) dikembangkan oleh Maniya dan Bhatt (2010) untuk memecahkan pengambilan keputusan multi-kriteria (MCDM) (Singh et al., 2019).
- Metode PSI digunakan memecahkan masalah keputusan yang kompleks di bawah ketidakpastian (Madic et al., 2017).

- Berbeda dengan kebanyakan metode MCDM, metode PSI tidak memerlukan penentuan kepentingan relatif dari kriteria, dan oleh karena itu tidak perlu menentukan bobot kriteria (Madic et al., 2017).
- Metode PSI menentukan bobot kriteria hanya dengan menggunakan informasi yang disediakan dalam matriks keputusan, yaitu menggunakan pendekatan objektif untuk menentukan bobot kriteria seperti standar deviasi atau metode entropi.

❑ Tahapan metode PSI :

1. Identifikasi kriteria yang relevan untuk evaluasi alternatif
2. Membuat matriks keputusan (X)
3. Normalisasi matriks keputusan ($\overline{X}$)
4. Penentuan nilai rata-rata kinerja yang dinormalisasi (N)
5. Penentuan nilai variasi preferensi ($\emptyset_j$)
6. Penentuan deviasi nilai preferensi (Ω_j)
7. Penentuan bobot kriteria (w_j)
8. Penentuan nilai PSI (θ_i)
9. Perangkingan alternatif

1. Identifikasi kriteria yang relevan untuk evaluasi alternatif

   Mendefinisikan kriteria, alternatif, menentukan nilai kriteria dari masing-masing alternatif.

2. Membuat matriks keputusan (X)

Setelah ada nilai kriteria (C) dan alternatif (A). Berikutnya menyusun tabel matriks keputusan.

$$x = \begin{bmatrix} x_{11} & \dots & x_{12} & \dots & x_{1n} \\ x_{21} & \dots & x_{22} & \dots & x_{2n} \\ x_{m1} & \dots & x_{m2} & \dots & x_{mn} \end{bmatrix}$$

Keterangan :
m = alternatif
n = kriteria

3. Normalisasi matriks keputusan ($\bar{X}$)

Kriteria Benefit:

$$\bar{x}_{ij} = \frac{x_{ij}}{x_{ij}^{max}}$$

Kriteria Cost:

$$\bar{x}_{ij} = \frac{x_{ij}^{min}}{x_{ij}}$$

x_{ij} = nilai performa dari alternatif i terhadap kriteria j

Max = nilai terbesar alternatif

Min = nilai terkecil alternatif

4. Penentuan nilai rata-rata kinerja yang dinormalisasi

$$N = \frac{1}{n} \sum_{i=1}^{m} \bar{x}_{ij}$$

N = rata-rata kinerja

n = alternatif

$\bar{x}_{ij}$ = normalisasi matriks

5. Penentuan nilai variasi preferensi

$$\emptyset_j = \sum_{i=1}^{m} (\bar{x}_{ij} - N)^2$$

$\emptyset_j$ = variasi preferensi

$\bar{x}_{ij}$ = normalisasi matriks

N = rata-rata kinerja

6. Penentuan deviasi (penyimpangan) nilai preferensi

$$\Omega_j = 1 - \emptyset_j$$

Ω_j = deviasi nilai preferensi

$\emptyset_j$ = variasi prefernsi

7. Penentuan bobot kriteria

$$w_j = \frac{\Omega_j}{\sum_{j=1}^{n} \Omega_j}$$

w_j = bobot kriteria

Ω_j = deviasi nilai preferensi

8. Penentuan nilai PSI

$$\theta_i = \sum_{j=1}^{n} \bar{x}_{ij}\, w_j$$

θ_i = nilai PSI

$\bar{x}_{ij}$ = normalisasi matriks

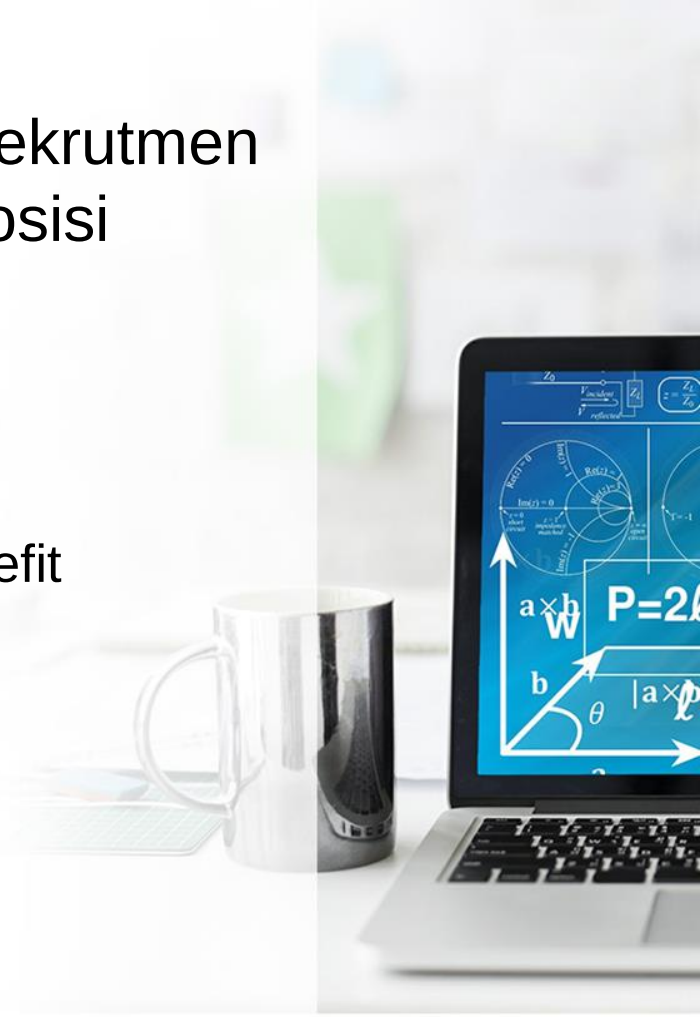
w_j = bobot kriteria

9. Perangkingan alternatif

   Penentuan rangking dilakukan berdasarkan nilai terbesar dari hasil perhitungan PSI yang telah telah dilakukan.

Contoh :

- Sebuah perusahaan akan melakukan rekrutmen kerja terhadap 5 calon pekerja untuk posisi operator mesin.
- Posisi yang dibutuhkan hanya 2 orang.
- Kriteria :
  - ✓ Pengalaman kerja (disimbolkan C1) ➔ Benefit
  - ✓ Pendidikan (C2) ➔ Benefit
  - ✓ Usia (C3) ➔ Benefit
  - ✓ Status perkawinan (C4) ➔ Cost
  - ✓ Alamat (C5) ➔ Cost



- Ada lima orang yang menjadi kandidat (alternatif) yaitu :
  - ✓ Doni Prakosa (disimbolkan A1)
  - ✓ Dion Pratama (A2)
  - ✓ Dina Ayu Palupi(A3)
  - ✓ Dini Ambarwati (A4)
  - ✓ Danu Nugraha (A5)

- Penilaian alternatif untuk setiap kriteria

Alternatif	kriteria				
	C1	C2	C3	C4	C5
A1	0,5	1	0,7	0,7	0,8
A2	0,8	0,7	1	0,5	1
A3	1	0,3	0,4	0,7	1
A4	0,2	1	0,5	0,9	0,7
A5	1	0,7	0,4	0,7	1

Jawab :

2. Membuat matriks keputusan (X) :

$$X = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,7 & 0,8 \\ 0,8 & 0,7 & 1 & 0,5 & 1 \\ 1 & 0,3 & 0,4 & 0,7 & 1 \\ 0,2 & 1 & 0,5 & 0,9 & 0,7 \\ 1 & 0,7 & 0,4 & 0,7 & 1 \end{bmatrix}$$

Alternatif	kriteria				
	C1	C2	C3	C4	C5
A1	0,5	1	0,7	0,7	0,8
A2	0,8	0,7	1	0,5	1
A3	1	0,3	0,4	0,7	1
A4	0,2	1	0,5	0,9	0,7
A5	1	0,7	0,4	0,7	1

3. Melakukan normalisasi matriks ($\bar{X}$)

Max = {0,5 ; 0,8 ; 1 ; 0,2 ; 1}
= 1

Min = {0,5 ; 0,8 ; 1 ; 0,2 ; 1}
= 0,2

$$X = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,7 & 0,8 \\ 0,8 & 0,7 & 1 & 0,5 & 1 \\ 1 & 0,3 & 0,4 & 0,7 & 1 \\ 0,2 & 1 & 0,5 & 0,9 & 0,7 \\ 1 & 0,7 & 0,4 & 0,7 & 1 \end{bmatrix}$$

Kriteria Benefit:

$$\bar{x}_{ij} = \frac{x_{ij}}{x_{ij}^{max}}$$

Kriteria Cost:

$$\bar{x}_{ij} = \frac{x_{ij}^{min}}{x_{ij}}$$

Kriteria C1 :

$$\bar{x}_{11} = \left(\frac{0,5}{1}\right) = 0,5$$

$$\bar{x}_{21} = \left(\frac{0,8}{1}\right) = 0,8$$

$$\bar{x}_{31} = \left(\frac{1}{1}\right) = 1$$

$$\bar{x}_{41} = \left(\frac{0,2}{1}\right) = 0,2$$

$$\bar{x}_{51} = \left(\frac{1}{1}\right) = 1$$

Max = {1 ; 0,7 ; 0,3 ; 1 ; 0,7}
= 1

Min = {1 ; 0,7 ; 0,3 ; 1 ; 0,7}
= 0,3

Kriteria C2 :

$$\bar{x}_{12} = \left(\frac{1}{1}\right) = 1$$

$$\bar{x}_{22} = \left(\frac{0,7}{1}\right) = 0,7$$

$$\bar{x}_{32} = \left(\frac{0,3}{1}\right) = 0,3$$

$$\bar{x}_{42} = \left(\frac{1}{1}\right) = 1$$

$$\bar{x}_{52} = \left(\frac{0,7}{1}\right) = 0,7$$

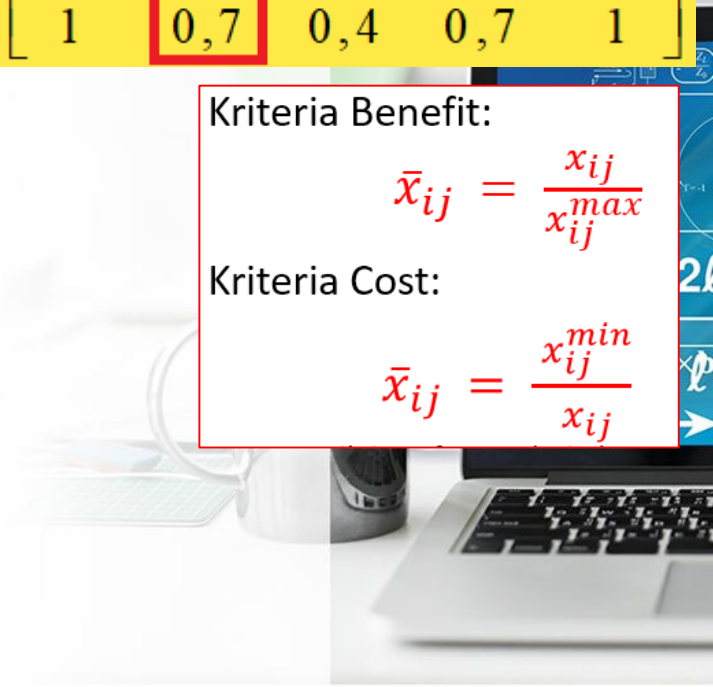
$$X = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,7 & 0,8 \\ 0,8 & 0,7 & 1 & 0,5 & 1 \\ 1 & 0,3 & 0,4 & 0,7 & 1 \\ 0,2 & 1 & 0,5 & 0,9 & 0,7 \\ 1 & 0,7 & 0,4 & 0,7 & 1 \end{bmatrix}$$

Kriteria Benefit:

$$\bar{x}_{ij} = \frac{x_{ij}}{x_{ij}^{max}}$$

Kriteria Cost:

$$\bar{x}_{ij} = \frac{x_{ij}^{min}}{x_{ij}}$$



Max = {0,7 ; 1 ; 0,4 ; 0,5 ; 0,4}
= 1

Min = {0,7 ; 1 ; 0,4 ; 0,5 ; 0,4}
= 0,4

$$X = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,7 & 0,8 \\ 0,8 & 0,7 & 1 & 0,5 & 1 \\ 1 & 0,3 & 0,4 & 0,7 & 1 \\ 0,2 & 1 & 0,5 & 0,9 & 0,7 \\ 1 & 0,7 & 0,4 & 0,7 & 1 \end{bmatrix}$$

Kriteria C3 :

$$\bar{x}_{13} = \left(\frac{0,7}{1}\right) = 0,7$$

$$\bar{x}_{23} = \left(\frac{1}{1}\right) = 1$$

$$\bar{x}_{33} = \left(\frac{0,4}{1}\right) = 0,4$$

$$\bar{x}_{43} = \left(\frac{0,5}{1}\right) = 0,5$$

$$\bar{x}_{53} = \left(\frac{0,4}{1}\right) = 0,4$$

Kriteria Benefit:

$$\bar{x}_{ij} = \frac{x_{ij}}{x_{ij}^{max}}$$

Kriteria Cost:

$$\bar{x}_{ij} = \frac{x_{ij}^{min}}{x_{ij}}$$

Max = {0,7 ; 0,5 ; 0,7 ; 0,9 ; 0,7}
= 0,9

Min = {0,7 ; 0,5 ; 0,7 ; 0,9 ; 0,7}
= 0,5

$$X = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,7 & 0,8 \\ 0,8 & 0,7 & 1 & 0,5 & 1 \\ 1 & 0,3 & 0,4 & 0,7 & 1 \\ 0,2 & 1 & 0,5 & 0,9 & 0,7 \\ 1 & 0,7 & 0,4 & 0,7 & 1 \end{bmatrix}$$

Kriteria C4 :

$$\bar{x}_{14} = \left(\frac{0,5}{0,7}\right) = 0,714$$

$$\bar{x}_{24} = \left(\frac{0,5}{0,5}\right) = 1$$

$$\bar{x}_{34} = \left(\frac{0,5}{0,7}\right) = 0,714$$

$$\bar{x}_{44} = \left(\frac{0,5}{0,9}\right) = 0,556$$

$$\bar{x}_{54} = \left(\frac{0,5}{0,7}\right) = 0,714$$

Kriteria Benefit:

$$\bar{x}_{ij} = \frac{x_{ij}}{x_{ij}^{max}}$$

Kriteria Cost:

$$\bar{x}_{ij} = \frac{x_{ij}^{min}}{x_{ij}}$$

Max = {0,8 ; 1 ; 1 ; 0,7 ; 1}
= 1

Min = {0,8 ; 1 ; 1 ; 0,7 ; 1}
= 0,7

$$X = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,7 & 0,8 \\ 0,8 & 0,7 & 1 & 0,5 & 1 \\ 1 & 0,3 & 0,4 & 0,7 & 1 \\ 0,2 & 1 & 0,5 & 0,9 & 0,7 \\ 1 & 0,7 & 0,4 & 0,7 & 1 \end{bmatrix}$$

Kriteria C5 :

$$\bar{x}_{15} = \left(\frac{0,7}{0,8}\right) = 0,875$$

$$\bar{x}_{25} = \left(\frac{0,7}{1}\right) = 0,7$$

$$\bar{x}_{35} = \left(\frac{0,7}{1}\right) = 0,7$$

$$\bar{x}_{45} = \left(\frac{0,7}{0,7}\right) = 1$$

$$\bar{x}_{55} = \left(\frac{0,7}{1}\right) = 0,7$$

Kriteria Benefit:

$$\bar{x}_{ij} = \frac{x_{ij}}{x_{ij}^{max}}$$

Kriteria Cost:

$$\bar{x}_{ij} = \frac{x_{ij}^{min}}{x_{ij}}$$

Hasil normalisasi matriks :

$$\bar{x}_{ij} = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,714 & 0,875 \\ 0,8 & 0,7 & 1 & 1 & 0,7 \\ 1 & 0,3 & 0,4 & 0,714 & 0,7 \\ 0,2 & 1 & 0,5 & 0,556 & 1 \\ 1 & 0,7 & 0,4 & 0,714 & 0,7 \end{bmatrix}$$

$$\sum_{i=1}^{m} \bar{x}_{ij} \quad 3,5 \quad 3,7 \quad 3 \quad 3,698 \quad 3,975$$

4. Penentuan nilai rata-rata kinerja yang dinormalisasi

$$N = \frac{1}{n}\sum_{i=1}^{m} \bar{x}_{ij}$$

N = rata-rata kinerja

n = alternatif

$\bar{x}_{ij}$ = normalisasi matriks

$$\sum_{i=1}^{m} \bar{x}_{ij} \quad 3{,}5 \quad 3{,}7 \quad 3 \quad 3{,}698 \quad 3{,}975$$

$$N_1 = \frac{1}{5}\ 3{,}5 = 0{,}7$$

$$N_2 = \frac{1}{5}\ 3{,}7 = 0{,}74$$

$$N_3 = \frac{1}{5}\ 3 = 0{,}6$$

$$N_4 = \frac{1}{5}\ 3{,}698 = 0{,}739$$

$$N_5 = \frac{1}{5}\ 3{,}975 = 0{,}795$$

$$N = 0{,}7 \quad 0{,}74 \quad 0{,}6 \quad 0{,}739 \quad 0{,}795$$

5. Penentuan nilai variasi preferensi

$$\emptyset_j = \sum_{i=1}^{m} (\bar{x}_{ij} - N)^2$$

$\emptyset_j$ = variasi preferensi

$\bar{x}_{ij}$ = normalisasi matriks

N = rata-rata kinerja

$$\bar{x}_{ij} = \begin{bmatrix} 0{,}5 & 1 & 0{,}7 & 0{,}714 & 0{,}875 \\ 0{,}8 & 0{,}7 & 1 & 1 & 0{,}7 \\ 1 & 0{,}3 & 0{,}4 & 0{,}714 & 0{,}7 \\ 0{,}2 & 1 & 0{,}5 & 0{,}556 & 1 \\ 1 & 0{,}7 & 0{,}4 & 0{,}714 & 0{,}7 \end{bmatrix}$$

$$N = \begin{bmatrix} 0{,}7 & 0{,}74 & 0{,}6 & 0{,}739 & 0{,}795 \end{bmatrix}$$

$\emptyset_{11} = (0{,}5 - 0{,}7)^2 = 0{,}040$

$\emptyset_{21} = (0{,}8 - 0{,}7)^2 = 0{,}010$

$\emptyset_{31} = (1 - 0{,}7)^2 = 0{,}090$

$\emptyset_{41} = (0{,}2 - 0{,}7)^2 = 0{,}250$

$\emptyset_{51} = (1 - 0{,}7)^2 = 0{,}090$

$\emptyset_{12} = (1 - 0{,}74)^2 = 0{,}068$

$\emptyset_{22} = (0{,}7 - 0{,}74)^2 = 0{,}002$

$\emptyset_{32} = (0{,}3 - 0{,}74)^2 = 0{,}194$

$\emptyset_{42} = (1 - 0{,}74)^2 = 0{,}068$

$\emptyset_{52} = (0{,}7 - 0{,}74)^2 = 0{,}002$

5. Penentuan nilai variasi preferensi

$$\emptyset_j = \sum_{i=1}^{m} (\bar{x}_{ij} - N)^2$$

$\emptyset_j$ = variasi preferensi

$\bar{x}_{ij}$ = normalisasi matriks

N = rata-rata kinerja

$$\bar{x}_{ij} = \begin{bmatrix} 0{,}5 & 1 & 0{,}7 & 0{,}714 & 0{,}875 \\ 0{,}8 & 0{,}7 & 1 & 1 & 0{,}7 \\ 1 & 0{,}3 & 0{,}4 & 0{,}714 & 0{,}7 \\ 0{,}2 & 1 & 0{,}5 & 0{,}556 & 1 \\ 1 & 0{,}7 & 0{,}4 & 0{,}714 & 0{,}7 \end{bmatrix}$$

$$N = \begin{bmatrix} 0{,}7 & 0{,}74 & 0{,}6 & 0{,}739 & 0{,}795 \end{bmatrix}$$

$\emptyset_{13} = (0{,}7 - 0{,}6)^2 = 0{,}010$

$\emptyset_{23} = (1 - 0{,}6)^2 = 0{,}160$

$\emptyset_{33} = (0{,}4 - 0{,}6)^2 = 0{,}040$

$\emptyset_{43} = (0{,}5 - 0{,}6)^2 = 0{,}010$

$\emptyset_{53} = (0{,}4 - 0{,}6)^2 = 0{,}040$

$\emptyset_{14} = (0{,}714 - 0{,}739)^2 = 0{,}001$

$\emptyset_{24} = (1 - 0{,}739)^2 = 0{,}068$

$\emptyset_{34} = (0{,}714 - 0{,}739)^2 = 0{,}001$

$\emptyset_{44} = (0{,}556 - 0{,}739)^2 = 0{,}034$

$\emptyset_{54} = (0{,}714 - 0{,}739)^2 = 0{,}001$

5. Penentuan nilai variasi preferensi

$$\emptyset_{15} = (0{,}875 - 0{,}795)^2 = 0{,}006$$
$$\emptyset_{25} = (0{,}7 - 0{,}795)^2 = 0{,}009$$
$$\emptyset_{35} = (0{,}7 - 0{,}795)^2 = 0{,}009$$
$$\emptyset_{45} = (1 - 0{,}795)^2 = 0{,}042$$
$$\emptyset_{55} = (0{,}7 - 0{,}795)^2 = 0{,}009$$

$$\phi_j = \begin{bmatrix} 0{,}040 & 0{,}068 & 0{,}010 & 0{,}001 & 0{,}006 \\ 0{,}010 & 0{,}002 & 0{,}160 & 0{,}068 & 0{,}009 \\ 0{,}090 & 0{,}194 & 0{,}040 & 0{,}001 & 0{,}009 \\ 0{,}250 & 0{,}068 & 0{,}010 & 0{,}034 & 0{,}042 \\ 0{,}090 & 0{,}002 & 0{,}040 & 0{,}001 & 0{,}009 \end{bmatrix}$$

$$\phi_j = \begin{bmatrix} 0{,}480 & 0{,}332 & 0{,}260 & 0{,}104 & 0{,}076 \end{bmatrix}$$

$$\emptyset_j = \sum_{i=1}^{m} (\bar{x}_{ij} - N)^2$$

$\emptyset_j$ = variasi preferensi

$\bar{x}_{ij}$ = normalisasi matriks

N = rata-rata kinerja

$$\bar{x}_{ij} = \begin{bmatrix} 0{,}5 & 1 & 0{,}7 & 0{,}714 & 0{,}875 \\ 0{,}8 & 0{,}7 & 1 & 1 & 0{,}7 \\ 1 & 0{,}3 & 0{,}4 & 0{,}714 & 0{,}7 \\ 0{,}2 & 1 & 0{,}5 & 0{,}556 & 1 \\ 1 & 0{,}7 & 0{,}4 & 0{,}714 & 0{,}7 \end{bmatrix}$$

$$N = \begin{bmatrix} 0{,}7 & 0{,}74 & 0{,}6 & 0{,}739 & 0{,}795 \end{bmatrix}$$

6. Penentuan deviasi nilai preferensi

$\Omega_j = 1 - \emptyset_j$

Ω_j = deviasi nilai preferensi

$\emptyset_j$ = variasi prefernsi

$\phi_j = [0{,}480 \quad 0{,}332 \quad 0{,}260 \quad 0{,}104 \quad 0{,}076]$

Ω_j = 1 – 0,480 = 0,520

Ω_j = 1 – 0,332 = 0,668

Ω_j = 1 – 0,260 = 0,740

Ω_j = 1 – 0,104 = 0,896

Ω_j = 1 – 0,076 = 0,925

$\sum \Omega_j$ = **3,749**

7. Penentuan bobot kriteria

$$w_j = \frac{\Omega_j}{\sum_{j=1}^{n} \Omega_j}$$

Ω_j = 1 – 0,480 = 0,520

Ω_j = 1 – 0,332 = 0,668

Ω_j = 1 – 0,260 = 0,740

Ω_j = 1 – 0,104 = 0,896

Ω_j = 1 – 0,076 = 0,925

$\sum \Omega_j$ = **3,749**

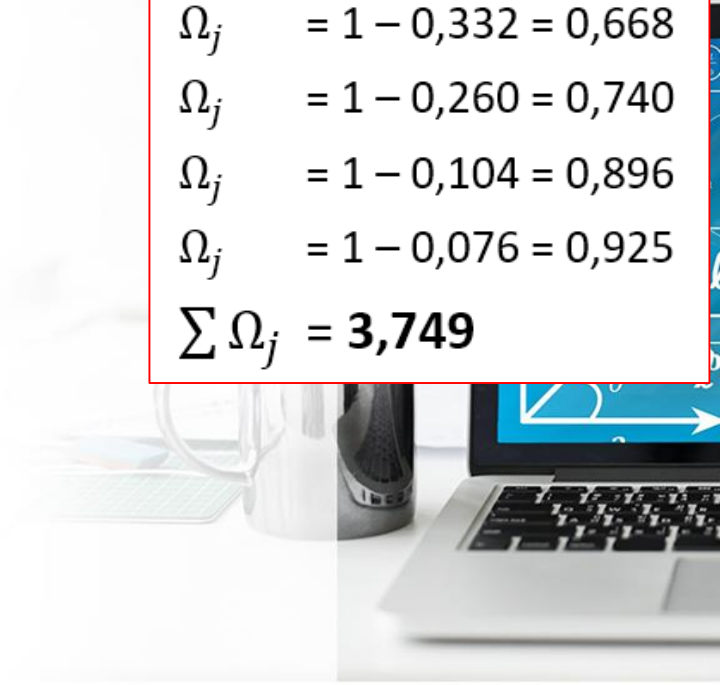
$$w_1 = \frac{0{,}520}{3{,}749} = 0{,}139$$

$$w_2 = \frac{0{,}668}{3{,}749} = 0{,}178$$

$$w_3 = \frac{0{,}740}{3{,}749} = 0{,}197$$

$$w_4 = \frac{0{,}896}{3{,}749} = 0{,}239$$

$$w_5 = \frac{0{,}925}{3{,}749} = 0{,}247$$



8. Penentuan nilai PSI

θ_{11} = 0,5 * 0,139 = 0,069

θ_{21} = 0,8 * 0,139 = 0,111

θ_{31} = 1 * 0,139 = 0,139

θ_{41} = 0,2 * 0,139 = 0,028

θ_{51} = 1 * 0,139 = 0,139

θ_{12} = 1 * 0,178 = 0,178

θ_{22} = 0,7 * 0,178 = 0,125

θ_{32} = 0,3 * 0,178 = 0,053

θ_{42} = 1 * 0,178 = 0,178

θ_{52} = 0,7 * 0,178 = 0,125

$$\theta_i = \sum_{j=1}^{n} \bar{x}_{ij}\, w_j$$

θ_i = nilai PSI

$\bar{x}_{ij}$ = normalisasi matriks

w_j = bobot kriteria

$$\bar{x}_{ij} = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,714 & 0,875 \\ 0,8 & 0,7 & 1 & 1 & 0,7 \\ 1 & 0,3 & 0,4 & 0,714 & 0,7 \\ 0,2 & 1 & 0,5 & 0,556 & 1 \\ 1 & 0,7 & 0,4 & 0,714 & 0,7 \end{bmatrix}$$

$$w_1 = \frac{0,520}{3,749} = 0,139$$

$$w_2 = \frac{0,668}{3,749} = 0,178$$

$$w_3 = \frac{0,740}{3,749} = 0,197$$

$$w_4 = \frac{0,896}{3,749} = 0,239$$

$$w_5 = \frac{0,925}{3,749} = 0,247$$

8. Penentuan nilai PSI

θ_{13} = 0,7 * 0,197 = 0,138

θ_{23} = 1 * 0,197 = 0,197

θ_{33} = 0,4 * 0,197 = 0,079

θ_{43} = 0,5 * 0,197 = 0,099

θ_{53} = 0,4 * 0,197 = 0,079

θ_{14} = 0,714 * 0,239 = 0,171

θ_{24} = 1 * 0,239 = 0,239

θ_{34} = 0,714 * 0,239 = 0,171

θ_{44} = 0,556 * 0,239 = 0,133

θ_{54} = 0,714 * 0,239 = 0,171

$$\theta_i = \sum_{j=1}^{n} \bar{x}_{ij}\, w_j$$

θ_i = nilai PSI

$\bar{x}_{ij}$ = normalisasi matriks

w_j = bobot kriteria

$$\bar{x}_{ij} = \begin{bmatrix} 0,5 & 1 & 0,7 & 0,714 & 0,875 \\ 0,8 & 0,7 & 1 & 1 & 0,7 \\ 1 & 0,3 & 0,4 & 0,714 & 0,7 \\ 0,2 & 1 & 0,5 & 0,556 & 1 \\ 1 & 0,7 & 0,4 & 0,714 & 0,7 \end{bmatrix}$$

$w_1 = \frac{0,520}{3,749} = 0,139$

$w_2 = \frac{0,668}{3,749} = 0,178$

$w_3 = \frac{0,740}{3,749} = 0,197$

$w_4 = \frac{0,896}{3,749} = 0,239$

$w_5 = \frac{0,925}{3,749} = 0,247$

8. Penentuan nilai PSI

$$\theta_i = \sum_{j=1}^{n} \bar{x}_{ij}\, w_j$$

θ_i = nilai PSI

$\bar{x}_{ij}$ = normalisasi matriks

w_j = bobot kriteria

θ_{15} = 0,875 * 0,247 = 0,216

θ_{25} = 0,7 * 0,247 = 0,173

θ_{35} = 0,7 * 0,247 = 0,173

θ_{45} = 1 * 0,247 = 0,247

θ_{55} = 0,7 * 0,247 = 0,173

$$\bar{x}_{ij} = \begin{bmatrix} 0{,}5 & 1 & 0{,}7 & 0{,}714 & 0{,}875 \\ 0{,}8 & 0{,}7 & 1 & 1 & 0{,}7 \\ 1 & 0{,}3 & 0{,}4 & 0{,}714 & 0{,}7 \\ 0{,}2 & 1 & 0{,}5 & 0{,}556 & 1 \\ 1 & 0{,}7 & 0{,}4 & 0{,}714 & 0{,}7 \end{bmatrix}$$

$$\theta_i = \begin{bmatrix} 0{,}069 & 0{,}178 & 0{,}138 & 0{,}171 & 0{,}216 \\ 0{,}111 & 0{,}125 & 0{,}197 & 0{,}239 & 0{,}173 \\ 0{,}139 & 0{,}053 & 0{,}079 & 0{,}171 & 0{,}173 \\ 0{,}028 & 0{,}178 & 0{,}099 & 0{,}133 & 0{,}247 \\ 0{,}139 & 0{,}125 & 0{,}079 & 0{,}171 & 0{,}173 \end{bmatrix}$$

$$w_1 = \frac{0{,}520}{3{,}749} = 0{,}139$$

$$w_2 = \frac{0{,}668}{3{,}749} = 0{,}178$$

$$w_3 = \frac{0{,}740}{3{,}749} = 0{,}197$$

$$w_4 = \frac{0{,}896}{3{,}749} = 0{,}239$$

$$w_5 = \frac{0{,}925}{3{,}749} = 0{,}247$$

8. Penentuan nilai PSI

$$\theta_i = \sum_{j=1}^{n} \bar{x}_{ij}\, w_j$$

θ_i = nilai PSI

$\bar{x}_{ij}$ = normalisasi matriks

w_j = bobot kriteria

$$\theta_i = \begin{bmatrix} 0{,}069 & 0{,}178 & 0{,}138 & 0{,}171 & 0{,}216 \\ 0{,}111 & 0{,}125 & 0{,}197 & 0{,}239 & 0{,}173 \\ 0{,}139 & 0{,}053 & 0{,}079 & 0{,}171 & 0{,}173 \\ 0{,}028 & 0{,}178 & 0{,}099 & 0{,}133 & 0{,}247 \\ 0{,}139 & 0{,}125 & 0{,}079 & 0{,}171 & 0{,}173 \end{bmatrix}$$

$$\theta_i = \begin{bmatrix} 0{,}772 \\ 0{,}845 \\ 0{,}615 \\ 0{,}684 \\ 0{,}686 \end{bmatrix}$$

- Nilai terbesar ada pada A2 = 0,845 dan A1 = 0,772 sehingga Dion Pratama dan Doni Prakosa adalah alternatif yang terpilih sebagai alternatif terbaik.
- Dengan kata lain, Dion Pratama dan Doni Prakosa terpilih untuk posisi operator mesin.

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