

Mapping Competency Candidate of TKI with MCDM Method for Standardization of Work Feasibility

Deden Prayitno

Faculty of Information Technology

Perbanas Institute, Jl. Perbanas, Setiabudi – KaretKuningan,
Jakarta 12940 – Indonesia



Abstract - Candidate Indonesian labour (TKI) who will be dispatched abroad is the object of this research. The aim of this research is to improve the quality of decision making in selecting the prospective migrant workers who will be dispatched abroad, so that every worker who will be dispatched has certainly have good ability in all things. Various breakthroughs to minimize emerging problems continue, but still to this day various problems arise, including the threat of capital punishment against migrant workers in Malaysia, as well as in Saudi Arabia. The problem that often exists is the number of PJTKI that manipulate the data of migrant workers, whether age, issuing ID cards, certification of expertise, insurance. Integrated information systems, both public and private providers, can minimize the emergence of the above mentioned problems, information systems for online and integrated decision-making support, with access to a centralized database, and this will facilitate control in all the elements related to the bureaucracy of TKI. this research is to make the decision support system of the feasibility of TKI abroad by using MCDM (multiple criteria decision making) with Promethee method which can generate weighting sequence from the complete parameter number which resulted in rank order of prospective migrant workers, from the highly prepared to the less ready so that the government can ensure the properness of a TKI can be departed abroad with the completeness of good administrative requirements, so as to minimize problems that often arise in TKI and provide convenience to the government to conduct administrative supervision in an integrated, both during preparation, departure and placement outside country.

Keywords - TKI; MCDM; Promethee; BNP2TK; Ranking.

I. INTRODUCTION

The development of employment in major cities in Indonesia is still much smaller when compared to the number of workers looking for work. The Central Bureau of Statistics (BPS) explains the weakening of labor absorption in some industrial sectors, causing the unemployment rate to increase. Central Bureau of Statistics (BPS) reported the number of unemployed in Indonesia in August 2015 as much as 7.56 million people, increased 320 thousand people compared with the same period last year 7.24 million people[22]. In August 2015, open unemployment by education is dominated by Vocational High School (SMK) 12.65 percent, followed by High School 10,32 percent, Diploma 7,54 percent, Bachelor 6,40 percent, Junior High School 6,22 percent, and elementary school down 2.74

percent[22], [23]. There have been efforts by the government to reduce unemployment by empowering SMEs and cooperatives and doing various entrepreneurship training so that future generations are not only job seekers but also as job creators. Others again in suppressing unemployment is by opening opportunities for Indonesian workers to working abroad as Indonesian Workers (TKI)[2], [23].

The limited number of jobs available in Indonesia and the large number of offers from PPTKIS or PJTKI with the lure of big salaries is quite tempting, making so many people who are interested to become migrant workers abroad. The ease of administering the administration and the fast scheduled departure make prospective migrant workers not think long-term about the risks that will be faced [18]. Many PJTKI are only thinking to make the maximum profit

without thinking about the safety, security, feasibility and comfort of prospective migrant workers, not a few persons who play on the departure of prospective migrant workers, and the consequences of this act tKI problems continue to exist today[21].

Indonesian Workers (TKI) are Indonesian citizens who can perform a job that becomes their profession and qualify to work abroad [2], [21]. Delivery of migrant workers abroad is one solution to address domestic labor issues. Some other benefits that can be felt from the sending of TKI is as one of the source of foreign exchange revenue of the country, improving the welfare of TKI and the surrounding community which is sourced from the income or salary earned during work become any profession abroad, and other roles that can be carried is ambassadors of the nation to introduce Indonesia to the international world[18], [20].

In the regulation of the Minister of Manpower and Transmigration of the Republic of Indonesia number per.14 / men / x / 2010 concerning the implementation of the placement and protection of Indonesian workers abroad, explains the Candidate of Indonesian Workers, hereinafter referred to as TKI candidate is every Indonesian citizen who qualifies as job seekers who will work abroad and enrolled in regency / city government agencies [24]. The agency responsible for manpower and the Indonesian Private Employment Placement Executor hereinafter abbreviated as PPTKIS or formerly known as the Indonesian manpower service company (PJTKI) is a legal entity that has obtained written permission from the Government to organize the overseas placement service. Other bodies associated with TKI are the National Agency for Placement and Protection of Indonesian Workers, hereinafter abbreviated BNP2TKI is a non-ministerial government agency having the function of implementing policies in the field of placement and protection of overseas workers, there is also Indonesian Ministry of Placement and Protection Service hereinafter abbreviated as BP3TKI is a BNP2TKI tool which is tasked to provide ease of processing service of all documents of placement of TKI [2], [21].

The problems of migrant workers that can be known to date, such as unpaid salaries, work permits that are difficult to extend, penganiayaan TKI, involved drugs, or murder. Researchers try to see the root of the problem, why the problems of migrant workers from the past until now still emerge and repeatedly, one of the causes is not integrated online service system with a centralized database, because each related institution has a database and stand-alone applications, so administrative coordination is still done manually [2].

The purpose of this research is to improve the service to CTKI by making the model of integration of decision support system for the feasibility of TKI abroad, using multiple criteria of decision making (MCDM) with Promethee method which resulted in weighting rating, from a number of parameters which become the basis of calculation requirements [1], [2], [3].

II. MATERIAL AND METHODS

A. System Integration

Integrated information system or often called Enterprise Integration (EI) is a concept to make every application that works on various platforms in a company and different can synergy, and related to produce a unity of functionality, making it possible to share information within a company or outside a company that is integrated[11], [15]. This system is used to assist decision making in semi-structured situations and unstructured situations, where nobody knows exactly how decisions should be made [5]. Decision issues can be divided into two categories according to the number of criteria that is single criteria decision making (SCDM) that is decision making of single criterion and multiple criteria decision making (MCDM) that is decision of plural criteria, and below will be explained related to MCDM [1] , [6].

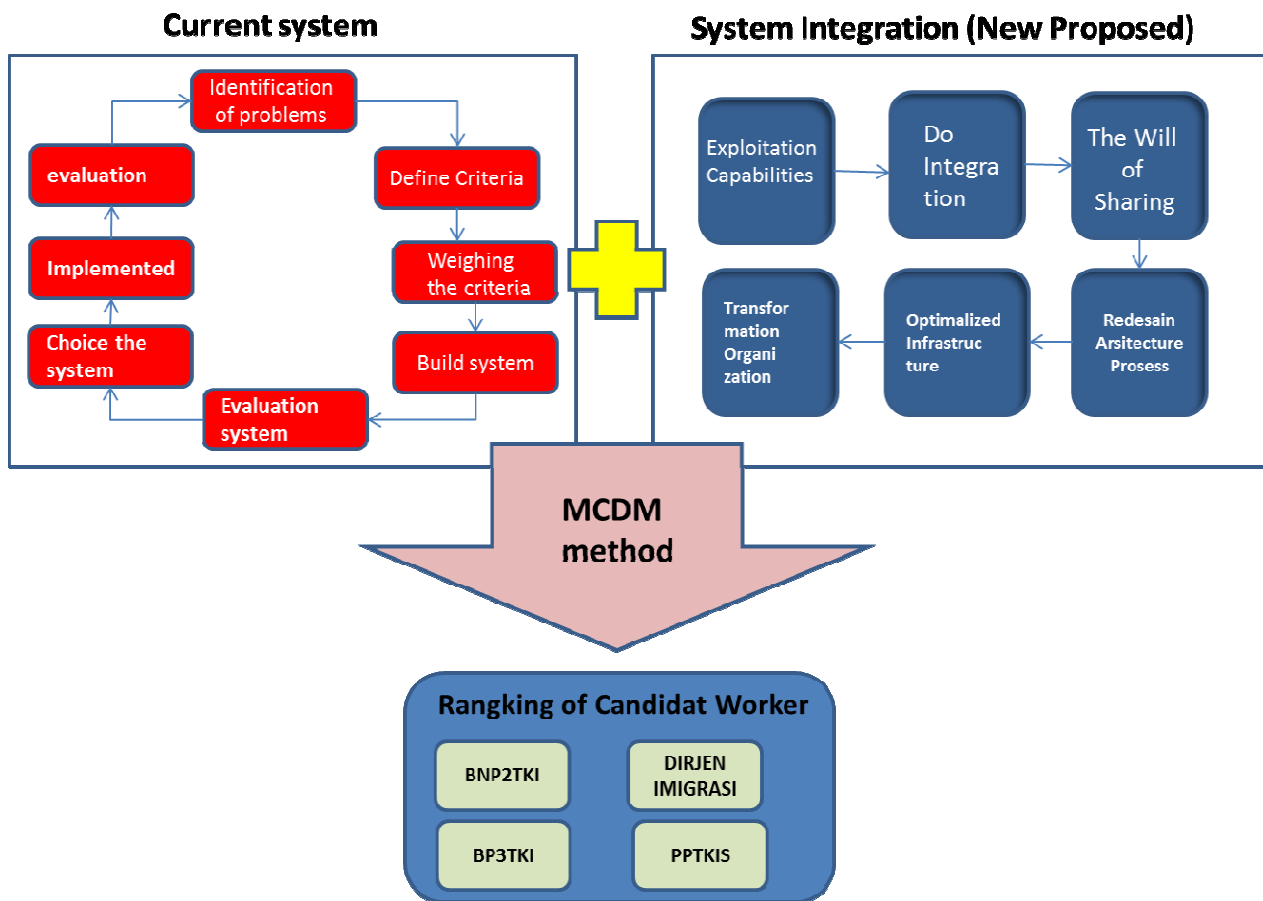


Figure 1. Decision Integration Model

B. Multiple Criteria Decision Making (MCDM)

MCDM is a decision-making technique of several alternative options. criteria are measures, rules or standards that guide a decision-making by formulating different attributes, objectives, and objectives, then the attributes, objectives and objectives are considered as criteria [4]. criteria are built on the basic human needs as well as the values it desires [5]. decision making with multicriteria can be written as follows:

$$\text{Max}\{f_1(x), f_2(x), f_3(x), \dots, f_j(x), \dots, f_k(x) : x \in R\}$$

B.1. The value of outranking relationships in Promethee [25].

Criteria Domination

The f value is the real value of a criterion: $K \quad R$

For each alternative $a \in K$, $f(a)$ is an evaluation of the alternative for a criterion. When two alternatives are compared $a, b \in K$, we must determine the preferred ratio.

Intensity delivery (P) of alternative preferences a to alternative b such that:

- $P(a, b) = 0$, means there is no (indifferent) between a and b , or no preference of a is better than b .
- $P(a, b) \sim 0$, means weak preference of a better than b .
- $P(a, b) \sim 1$, means strong preference of a better than b .
- $P(a, b) = 1$, means absolute preference from a better than b .

In this method, the preference function often produces different function values between the two evaluations, so: $P(a, b) = P(f(a) - f(b))$.

B.2. Multicriteria preference index

The multi criteria preferences index is determined based on the weighted average of the P_i preference function. $\varphi(a, b) = \sum_{i=1}^n \pi_i P_i(a, b) : \forall a, b \in A$

$\varphi(a, b)$ is the intensity of the decision maker's preference that alternative a is better than alternative b with simultaneous consideration of all criteria. It can be presented with a value between 0 and 1, with the following conditions:

- $\varphi(a, b) = 0$ shows weak preference for alternative $a >$ alternative b based on all criteria.
- $\varphi(a, b) = 1$ shows a strong preference for alternative $a >$ alternative b

Preference index is determined based on the value of outranking relationships on a number of criteria from each alternative. This relationship can be presented as a graph of the value of outranking, nodes-node is an alternative based on the assessment of certain criteria.

B.3. Promethee Ranking[25].

The calculation of the direction of preference is considered based on the index value :

- Leaving Flow $\varphi^+(a) = \frac{1}{n-1} \sum_{x \in A} \varphi(a, x)$
- Entering flow $\varphi^-(a) = \frac{1}{n-1} \sum_{x \in A} \varphi(a, x)$
- Net flow $\varphi(a) = \varphi^+(a) - \varphi^-(a)$

explanation::

- $\varphi(a, x)$ shows preference that alternative a is better than alternative x

- $\varphi(x, a)$ shows preference that alternative x is better than alternative
- $\varphi^+(a)$ = Leaving flow, is used to determine the order of priority in the process of promethee using a partial sequence.
- $\varphi^-(a)$ = Entering flow, is used to determine the order of priority in the process of promethee using a partial sequence.
- $\varphi(a)$ = Net flow, is used to produce a final decision of the determination of the problem in solving the problem so as to produce a complete sequence.

C. Previous Research

In a previous study, as shown in the table below, the criteria of selection criteria of migrant workers to be dispatched, with the help of decision support systems, were able to perform the proper selection of candidates of migrant workers more accurately using rankings [16]. Similarly, Ardina A and Ardretti and Firamom [1], concluded that decision support systems can rank prospective migrant workers, making it easier for BP3TKI to make decisions. Another is to conclude that the system can accelerate the process of calculating the assessment used for determining the prospective migrant workers who departed [18], and the last of the references as the previous research is Ari H, M. Arik concluded with good training on prospective workers can suppress the problems that occur [15].

Table 1. Previous Research

No	Peneliti	Judul Penelitian	Hasil Penelitian
1	Sri Kurniasih, S.T., M. Komdan Dienni Nur Faridah, 2014	Decision Support System Tki G To G To Use East Timor Profile Matching Method (Case Study Bnp2tki / Bp3tki)	able to generate a list of prospective migrant workers rank, so that it can generate information on the results of the eligibility of labor abroad based on the ranking order.
2	Ardina Ariani, Leon, Andretti Abdillah, Firamom Syakti, 2013	Decision Supporting Feasibility System TKI Overseas Using FMADM	able to produce a list of prospective migrant workers rank, making it easier for BP3TKI in making decisions TKI decent work overseas.
3	Hera Wasiati, Dwi Wijayanti, 2014	Decision Support System for the Eligibility of Indonesian Prospective Employers Using the Naive Bayes Method(Case Study: At P.T. Karyatama Mitra Sejati Yogyakarta)	can facilitate and accelerate the selection of Indonesian worker candidates because of the fast calculation process.

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

of the attributes that exist in the database in accordance with the needs of research. This is a small piece of data downloaded[17].

7	TKI_TKIPOBDESC	The name of the district where the prospective worker was born
8	TKI_TKIDOB	Date, Month and Year of birth of prospective migrant workers
9	TKI_TKIPENDIDIKANDESC	last education
10	TKI_TKI KTPNO	No. KTP
11	TKI_BLKDATE	Year of participation BLK
12	TKI_MASUKBLKDATE	date of participation BLK
13	TKI_KELUARBLKDATE	Date complete following BLK
14	TKI_WORKTYPEDESC	Preferred job type
15	LSPID	Certificate number LSP
16	TUKID	Number TUK
17	TKI_NOSERT	The certificate number of the training that followed

After the database is downloaded, the stages will be conducted to obtain the ranking, using the promethee method, where the stages begin by determining the basic administrative requirements as a mandatory requirement for the departure of prospective migrant workers abroad. Administration requirements that researchers use there are as many as 8 parameter criteria by selecting some attributes as shown in the table above. The selected parameters are age, document, education, up skill, work experience, language skills, skills and insights[9].

2. DISCUSSION

Stages of data analysis of some parameters of migrant worker candidate requirements by using promethee method [25], are:

A. *Enter the criteria value requirements.*

The criteria value of the requirements used in this study consisted of: age, document, education, up skill, peng_kerja, language, skilled, insight. Further criteria requirements are made alias to facilitate the calculation and then by using the naming attributes of prospective labor migrants as in the table below:

Table 4. Use of eligibility criteria with Alias

No.	Attribute	Alias
1	Age	A
2	Document	B
3	Education	C
4	Up_skill training	D
5	work experience	E
6	Language	F

7	skills	G
8	knowledge	H

Tabel 5. Calon TKI menggunakan Alias

No.	Attribute	Alias
1	ARIYAH MASTINI	A1
2	PUJI HARTATI	A2
3	FITRIYANI	A3
4	IFFAH BT ZAMAN RAJA	A4
5	FANI BT YUSUF	A5
6	NINIK	A6
7	IKE ATMANAH	A7

B. Next calculate the difference in the value of the ratio

Below is shown the stages of the table to show the recapitulation score or criteria values consisting of A, B, C,

D, E, F, G, and H for each alternative sample of the prospective TKI.

Table 6. Recapitulation Total score Alternative criteria to prospective migrant workers

Candidate Of TKI	Total score								
	A	B	C	D	E	F	G	H	Total
A1	3	3	2	2	3	3	4	3	20
A2	3	3	2	2	3	3	3	4	20
A3	5	3	2	1	1	2	3	3	15
A4	2	2	1	2	3	2	3	2	15
A5	3	2	1	2	3	3	3	3	17
A6	2	3	2	2	4	3	3	3	20
A7	5	2	2	1	2	4	3	2	16

Due to the data obtained is converted to a composite rating so that the resulting value is normal then no need to normalize the data again. After process (a) and process (b) is

done, the next researcher calculates the preference value between samples as below.

C. Calculate the preference values between samples / alternatives

From the recapitulation data the number of alternative scores of administrative requirements above will be determined the preference function between samples. For more details can be seen in the calculation below, for example below calculation for the comparison of samples A1 and A2.

Example :A(A1, A2)

$$d = A(A1) - A(A2)$$

$$d = 3 - 3$$

$$d = 0$$

$$\text{then } H(d) = 0$$

With the same step, we get the value of preference function between samples from all criteria.

Table 7. The result of calculating the preference value between sample Candidate Requirements TKI

Compare of Sample	A	B	C	D	E	F	G	H	index multicriteria
A1, A2	0	0	1	1	0	0	0	0	0.2899
A1, A3	0	0	1	1	0	0	0	0	0.3194
A1, A4	1	0	1	1	1	1	0	0	0.5553
A1, A5	0	1	1	1	0	1	0	1	0.4420
A1, A6	1	1	1	1	0	0	0	0	0.5360
A1, A7	0	0	1	1	0	0	0	0	0.2882
A2, A1	0	0	1	1	0	0	0	0	0.3055
A2, A3	0	0	1	1	1	1	0	0	0.4442
A2, A4	1	1	1	1	0	1	0	1	0.5539
A2, A5	0	1	1	1	0	0	0	0	0.4314
A2, A6	1	0	1	1	0	0	0	0	0.4509
A2, A7	0	1	1	1	1	0	0	1	0.6071
A3, A1	1	1	1	1	1	1	1	1	0.8571
A3, A2	1	1	1	1	1	1	1	1	0.8571
A3, A4	1	1	1	1	1	1	1	1	0.8567
A3, A5	1	1	1	1	1	1	1	1	0.8535
A3, A6	1	1	1	1	1	1	1	1	0.8282
A3, A7	0	1	1	1	1	1	1	1	0.6255
A4, A1	0	0	0	0	0	0	0	0	0.0042
A4, A2	0	0	0	0	0	0	0	0	0.0332
A4, A3	0	0	0	1	1	0	0	0	0.2659

A4, A5	0	0	1	0	0	0	0	0	0.1275
A4, A6	0	0	0	0	0	0	0	0	0.0201
A4, A7	0	0	0	1	0	0	0	0	0.1610
A5, A1	0	0	1	1	0	0	0	0	0.2882
A5, A2	0	0	1	1	0	0	0	0	0.3055
A5, A3	0	0	1	1	1	1	0	0	0.4443
A5, A4	1	1	1	1	0	1	0	1	0.5547
A5, A6	1	0	1	1	0	0	0	0	0.4376
A5, A7	0	1	1	1	1	0	0	1	0.5005
A6, A1	0	0	0	0	0	0	0	0	0.0042
A6, A2	0	0	0	0	0	0	0	0	0.0335
A6, A3	0	0	0	1	1	0	0	0	0.2680
A6, A4	0	0	1	0	0	0	0	0	0.1442
A6, A5	0	0	1	0	0	0	0	0	0.1540
A6, A7	0	0	0	1	0	0	0	0	0.2319
A7, A1	1	1	1	1	1	1	1	1	0.8552
A7, A2	1	1	1	1	1	1	1	1	0.8415
A7, A3	0	1	1	1	1	1	1	1	0.7319
A7, A4	1	1	1	1	1	1	1	1	0.8555
A7, A5	1	1	1	1	1	1	1	1	0.8438
A7, A6	1	1	1	1	1	1	1	1	0.7500

D. Calculate aggregate preference function

Here is an example of calculating the aggregate of the preference function of the number of weighted criteria multiplied by the value of the preference function, since the criteria weights are the same for each criterion, the aggregate value of the preference function is derived from the total preference value of A, B, C, D, E, F, G, H for each sample the alternative administrative requirements are divided by the number of criteria, in this case the number of criteria is 8 which consists of A, B, C, D, E, F, G, H. The

following is an example of calculating the aggregate value of a preference function of A001 sample comparison and A002.

$\pi(A001, A002)$

$$= (0+0+0+1+1+0+0+0) / 8 = 0.2899$$

With the same step, we get the aggregate value of preference function between samples from all criteria.

Table 8. Results of calculating aggregate values of preference between sample locations

	A1	A2	A3	A4	A5	A6	A7	Total
A1		0.28993	0.31941	0.55525	0.44200	0.53602	0.28819	2.43080
A2	0.30553		0.44424	0.55392	0.43136	0.45089	0.60714	2.79309
A3	0.85714	0.85709		0.85669	0.85352	0.82819	0.62552	4.87815
A4	0.00416	0.03324	0.26594		0.12752	0.02013	0.16102	0.61201
A5	0.28819	0.30554	0.44434	0.55470		0.43757	0.50052	2.53086
A6	0.00419	0.03350	0.26803	0.14425	0.15399		0.23190	0.83586
A7	0.85519	0.84149	0.73193	0.85547	0.84375	0.75000		4.87783
jumlah	2.31439	2.36079	2.47389	3.52027	2.85214	3.02280	2.41430	

E. Menghitung Leaving flow dan entering flow

e.1. Calculate *leaving (positive) flow*

Here is an example of calculating the value of leaving flow of the sample A1.

$$\begin{aligned}\varphi^+(A1) &= \frac{1}{7-1} \times (0.2899 + 0.3194 + 0.5553 + 0.4420 + \\ &0.5360 + 0.2882) \\ &= 2.43080\end{aligned}$$

With the same step, we will get the value of leaving flow for all samples.

Table 9. the value of leaving flow

A1	0.4051
A2	0.4655
A3	0.8130
A4	0.1020
A5	0.4218
A6	0.1393
A7	0.8130

e.2. Calculate *Entering (negative) flow*

Here is an example of calculating the value of Entering flow of sample A1.

$$\begin{aligned}\varphi^-(A1) &= \frac{1}{7-1} \times (0.3055 + 0.8571 + 0.0042 + 0.2882 + 0.0042 + 0.8552) \\ &= 0.23144\end{aligned}$$

With the same step, we will get the value of leaving flow for all samples.

Table 10.the value of Entering flow

A1	0.3857
A2	0.3935
A3	0.4123
A4	0.5867
A5	0.4754
A6	0.5038
A7	0.4024

F. The value of Leaving & Entering Flow

The following table presents the results of the value of leaving and entering flow of each of all samples for administrative requirements as the object of research.

Table 11.The value of Leaving dan Entering Flow sample

Alternative	Leaving Flow	Entering Flow
A1	0.4051	0.3857
A2	0.4655	0.3935
A3	0.8130	0.4123
A4	0.1020	0.5867
A5	0.4218	0.4754
A6	0.1393	0.5038
A7	0.8130	0.4024

G. Calculating net outranking flow

$$\varphi(i) = 0.066 - 0.3857$$

$$= -0.320154$$

The net outranking value is derived from the value of leaving flow minus the entering flow value. The sample with the largest or highest outranking value will occupy the top position in the rankings.

With the same step, we will get the value of leaving flow for all samples.

Here is an example of calculating the outranking value of sample A1

Table 12.The value of Net Outranking Flow sample lokasi

Alternative	Leaving Flow	Entering Flow	Net Out Ranking Flow
A1	0.06558	0.38573	-0.320154
A2	0.06872	0.39347	-0.324746

A3	0.09779	0.41231	-0.314529
A4	0.07923	0.58671	-0.507486
A5	0.08397	0.47536	-0.391390
A6	0.06706	0.50380	-0.436736
A7	0.00000	0.40238	-0.402383

From the calculation of ranking using the method promethee obtained sequence as the table below:

Table 13.Result Ranking method of Promethee sample Location.

Ranking	Alternative	Net Outranking Flow
1	A3	-0.314529
2	A1	-0.320154
3	A2	-0.324746
4	A5	-0.391390
5	A7	-0.402383
6	A6	-0.436736
7	A4	-0.507486

The first rank is the one that has the highest net outranking flow value which means the A3 alternative which is the first rank is the most ready TKI candidate from the side of the completeness of the document and has the best assessment of each parameter requirement, so that A3 participants are considered most ready to be dispatched to become prospective labor migrants, while those with the smallest net outranking flow value are the lowest rank, it

means the weakest prospective migrant worker of the administration document, making it possible not to be dispatched.

Here are the sequence of prospective migrant workers who will leave overseas as many as 7 people as a sample of thousands of data available on the database.

Table 14. List of prospective migrant workers in rank order

No	Tki_Tkiname	Date of birth	Age (2015)	Education	TKI_NEGARADESC	Priority Ranking
1	ARIYAH MASTINI	8/9/1989	26	SMP	TAIWAN	2
2	PUJI HARTATI	2/17/1989	26	SMP	QATAR	3
3	FITRIYANI	6/16/1991	24	SMP	SINGAPURA	1
4	IFFAH BT ZAMAN RAJA	4/20/1985	30	SD	QATAR	7

5	FANI BT YUSUF	11/2/1987	28	SD	HONG KONG	4
6	NINIK	9/4/1984	31	SMP	UNITED ARAB EMIRATES	6
7	IKE ATMANAH	12/31/1995	20	SMP	OMAN	5

IV. CONCLUSION

After doing research with data calculation in several stages to get ranking by using method of promethee, where this result can be used to assist BNP2TKI in sending prospective migrant worker to destination country. The ranking results can be concluded that the promethee method can be used by the leadership in assisting the decision in choosing the prospective migrant workers from the most worth departing because it has a very good document requirements to the less feasible because of the lack of document requirements. Using eight parameters consisting of age, document, education, upskill, work experience, language skills, skills and insights, then weighted through several stages in the calculation of the promethee method, and in the end ranking can be generated, making it easier for the authorities in determining the eligibility of the prospective migrant workers departure. Promethee method is suitable to assist decision making in determining who is eligible and who is delayed from prospective migrant workers to be sent abroad. In the next research will be built application system to conduct ranking, which is used to calculate data of prospective labor migrants in large numbers or even very much.

V. RECOMMENDATIONS

The recommendation that can be given for further research in applying the promethee method is that this method can be used to perform calculations for many or even very large database, and of course it should be built a decision support application system that can present rankings in the form of weighted sequence reports from each prospective TKI, from which have the largest weights to the smallest in the number of large databases. Similarly, with the construction of application systems, the number of parameters that were previously eight can easily be added as needed.

REFERENCES

- [1] Ariani, Ardina, Leon Andretti Abdillah, and Firamon Syakti. "Sistem pendukung keputusan kelayakan TKI ke luar negeri menggunakan FMADM." arXiv preprint arXiv:1312.5162 (2013).
- [2] Azzahrah, Nisyyah, Anis Fuad, and Riny Handayani. "Efektivitas Penerapan Sistem Komputerisasi Tenaga Kerja Luar Negeri Di Badan Nasional Penempatan Dan Perlindungan Tenaga Kerja Indonesia" (Studi pada BP3TKI, PPTKIS dan Dinas Ketenagakerjaan di Provinsi Banten). Diss. Universitas Sultan Ageng Tirtayasa, 2014.
- [3] Bambang, Yuwono, Richard Kodong Frans, and Ayusta Y. Hendy. "Sistem Pendukung Keputusan Menggunakan Metode Promethee (Studi Kasus: Stasiun Pengisian Bahan Bakar Umum)." Telematika (2011).
- [4] Deshmukh, S. C. "Preference ranking organization method of enrichment evaluation (Promethee)." International Journal of Engineering Science Invention 2.11 (2013): 28-34.
- [5] Doumpos, Michael, and Constantin Zopounidis. "A multicriteria decision support system for bank rating." Decision Support Systems 50.1 (2010): 55-63.
- [6] Efraim Turban et.al., "Decision Support and Business Intelligence Systems (8th Edition)", Prentice Hall (2006)
- [7] Hanifah, R., "Implementasi Metode Promethee Dalam Penentuan Penerima Kredit Usaha Rakyat (KUR)", (2015), Jurnal Teknologi 164-172, vol. 8, nomor 2, Desember 2015, ISSN 1979-3405.
- [8] Kilic, Huseyin Selcuk, Selim Zaim, and Dursun Delen. "Selecting "The Best" ERP system for SMEs using a combination of ANP and PROMETHEE methods." Expert Systems with Applications 42.5 (2015): 2343-2352.

- [9] Lemantara, Julianto, Noor Akhmad Setiawan, and Marcus Nurtiantara Aji. "Rancang Bangun Sistem Pendukung Keputusan Pemilihan Mahasiswa Berprestasi Menggunakan Metode AHP dan Promethee." *Jurnal Nasional Teknik Elektro dan Teknologi Informasi (JNTETI)* 2.1 (2013).
- [10] L Karlitasari, D Suhartini and L Nurrosikawati, 2017 Implementation of preference ranking organization method for enrichment evaluation (Promethee) on selection system of student's achievement, IORA-ICOR 2017, doi:10.1088/1757-899X/332/1/012029
- [11] Madya, Suwarsih, (2006) Teori dan Praktik Penelitian Tindakan (Action Research), Alfabeta: Bandung.
- [12] Marlina, Asti. "Metode Bayes untuk Menentukan Kelayakan Calon Tenaga Kerja ke Luar Negeri." *Jurnal Ilmiah Teknologi dan Sains* 1 (2010).
- [13] Nurcahyo Eko S., Ridwan R., Arief Prasetyo. 2017, "Pengembangan Sistem Informasi Penentuan Mahasiswa Berprestasi Menggunakan Metode Promethee (Studi Kasus Politeknik Negeri Malang)". *Jurnal Informatika Polinema*, Volume 3, Edisi 4, Agustus 2017
- [14] Pamungkas, Slamet Aji. "Implementasi Simple Object Access Protocol (SOAP) untuk Integrasi Aplikasi dan Basisdata di Lingkungan Instansi Pemerintah (Studi Kasus: Pemkot Banda Aceh)." *TEKNIK INFORMATIKA* 3.1 (2011).
- [15] Priyono, Ari Hendro, Mochammad Al Musadieq, and Arik Prasetya. "Pengembangan Sumber Daya Manusia Melalui Pelatihan Dalam Meningkatkan Kompetensi Tenaga Kerja Indonesia Yang Bekerja Ke Luar Negeri" (Studi Pada Kantor Cabang PT. Berkat Sukses Makmur Sejahtera)." *Jurnal Administrasi Bisnis* 33.1 (2016): 43-51.
- [16] Sri Kurniasih, Dienni Nur Faridah, "Sistem Pendukung Keputusan Kelayakan Tki G To G Ke Timor Leste Menggunakan Metode Profile Matching ((Studi Kasus Bnp2tki/Bp3tki)." *Jurnal Lpkia*, Vol.1 No.1, September 2014
- [17] Sugiarto, Mugi, and Pelita Fajarhati. "Implementasi Integrasi Data Antar Sistem Informasi Untuk Mendukung Decission Support System." *Unit Sumber Daya Informasi Institut Teknologi Bandung*. Jakarta: e-Indonesia Initiative (2008).
- [18] Wasiati, Hera, and Dwi Wijayanti. "Sistem Pendukung Keputusan Penentuan Kelayakan Calon Tenaga Kerja Indonesia Menggunakan Metode Naive Bayes (Studi Kasus: Di PT Karyatama Mitra Sejati Yogyakarta)." *IJNS-Indonesian Journal on Networking and Security* 3.2 (2014).
- [19] Wibowo, Ripto Mukti, Adhistya Erna Permanasari, and Indriana Hidayah. "Sistem Pendukung Keputusan Pemilihan Marketing Officer Berprestasi Dengan Metode Promethee (Studi Kasus: BRI Kantor Cabang Katamso Yogyakarta)." *SEMNASTEKNOMEDIA ONLINE* 3.1 (2015): 2-2.
- [20] Yudha, Hendy Ayusta, Bambang Yuwono, AndFrans Richard Kodong. "Sistem Pendukung Keputusan Menggunakan Metode Promethee (Studi Kasus: Stasiun Pengisian Bahan Bakar Umum)." *Telematika* 8.1 (2015).

Reference online :

- [21] <http://www.bnp2tki.go.id/read/9554/Kepala-BNP2TKI:-Penyiapan-TKI-Berkualitas-Tentukan-Perlindungan-TKI>
- [22] <https://www.bps.go.id/Brs/view/id/1196>
- [23] <http://bisnis.liputan6.com/read/2256860/strategi-pemerintah-jokowi-kurangi-tingkat-kemiskinan>
- [24] http://perlindungan.kemlu.go.id/assets/default/portal/images/galeri_hukum/Permenakertrans_No._PER_14_MEN_X_2010_.pdf
- [25] <https://pdfs.semanticscholar.org/edd6/f5ae9c1bfb2fdd5c9a5d66e56bdb22770460.pdf>. Brans JP and Vincke P. A preference ranking organisation method: The PROMETHEE method for MCDM. *Management Science*. 31, 6: 647-656. 1985.