

Decision Support Systems in the Placement of Electronic Officers of Indonesian Navy with Profile Matching Method

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Abstract: - Currently, the placement of Electronic Officer is not taking into account the criteria in a comprehensive manner to assist leaders in making decisions. Those criteria are educational background, psychological assessment results, in-service experience, personality, health, achievement and physical fitness. Therefore, research should be carried out to establish a Decision Support System (DSS) with a profile matching method. This method is used in this study because it has an advantage in finding the most ideal candidates in a position that the profile criteria have been determined. This study is aimed to analyze the placement of Electronic Officer in accordance with the competence on a certain positions and to get an application software of Decision Support System for placement of Electronic Officers to choose the most ideal officer stationed at the post. From the research, it was found that the presence of the Decision Support System for Job Placement of Electronic Officer cause the selection process such as collecting data, calculating the value of the Profile Matching and scoring candidates can be done easily, quickly, and precision. Sowith this system, the process of decision making by the superior to choose the most ideal officer to occupy a certain position become easier and more objective.

Keywords: *Electronic Officer, Decision Support System (DSS), Profile Matching.*

1. PRELIMINARY

Navy is a system composed of several sub-systems which the readiness has to be maintained by using an appropriate developing method for use in a variety of operations (Marsetio, 2013) both Military Operations for War (MOW) and Military Operations Other Than War (MOOTW). Thus, the existence of the Navy is closely linked to development activities and the use of personnel and material. Electronic Officers as a part of the Navy personnel have special duties and responsibilities in terms of material maintenance related to the field of armament, electronics and communications. Those duty and responsibilities could be running well if the placement of the electronic officer positions are in accordance with their competence. Currently, the placement of personnel of the Navy has been running through a position placement meeting by Personnel Administration Service by taking into account the data that already exists on the system of personnel management of the Navy, however it still has a weakness because it doesn't take into account the criteria in

a comprehensive manner that can help a superior take an objective decisions. Those criteria are personality, work performance, educational background, psychological assessment results, in-service experience, health and physical fitness. These criteria are required to place the Electronic officers at certain positions in accordance with the competence required in the position.

To solve the problem we need a decision-making tools that are implemented in an application program such as Decision Support System (Decision Support System) which is supported by a computer-based information systems. This information system use profile matching method to select the most ideal officer in a position that has been analyzed and determined the weight criteria of the profile. In the process of the placement of this position must be prepared to determine the candidate's rank through profile matching between the positions of the candidate profile, where the value gap between the profile positions with the candidate profile that determines the preparation of the ranking.

2. LITERATURE AND THEORETICAL

2.1. Literature review

According to Rachma (2003: 101), Employment Potential Mapping is a program of work carried out by the personnel department with more emphasis on the potential psychological aspects of which includes three aspects, namely:

- 1) Aspects of Intellectual Capability (Using test IST - Intelligenz Strukturen Teztie)
- 2) Behavioral Aspects of Work (using test Pauli)
- 3) Aspect Habits (using test Pauli)

The purpose of the mapping potential of the workforce are as follows:

- 1) The short-term goal is as basic considerations promotion, transfer, and employment.
- 2) The long-term goal is to develop career path employment.

According to Moekijat (1989: 30), there are four kinds of assessment systems and fourth positions such systems are classified into 2. The first type includes simple methods that does not use detail position factor. In this group, there are two systems that can be referred to the system non-

quantitative, the ranking system and the grading system. The second category covers systems that use a more detailed approach. Factors selected and graded positions and job requirements are indispensable. This class is also called quantitative approach where there are two systems, namely the point system and the factor-comparison system.

2.2. Theoretical basis.

2.2.1. Decision Support Systems (DSS)

Decision Support System (DSS) is a system which provide either problem-solving ability or communicating ability for semi-structured and unstructured problem. This system is used to help make decisions in situations of semi-structured and unstructured situations, where no one knows for sure how the decision should be made (Turban & Aronson, 2001) .DSS is aimed to provide information, guidance, predictions and direction to the user in order to make better decisions.

2.2.2. Profile Matching is a very important process in human resource management where the first set of competence (ability) required by the job. The Competence / capability must be fulfilled by the candidates officer. Generally, a profile matching process is a process of comparing the individual competencies into job competency that is known as differences in competence (called gap), the smaller the gap generated, the greater the weight value which means a greater opportunity for employees to take that position.

3. RESEARCH METHODOLOGY

The research methodology used in this thesis is to discuss about the series of activities undertaken in conducting research, including preliminary studies, the formulation of the problem, restrictions on the problem, the purpose of research, data collection, data processing and conclusions and suggestions.

3.1. Flowchart of Research Methodology

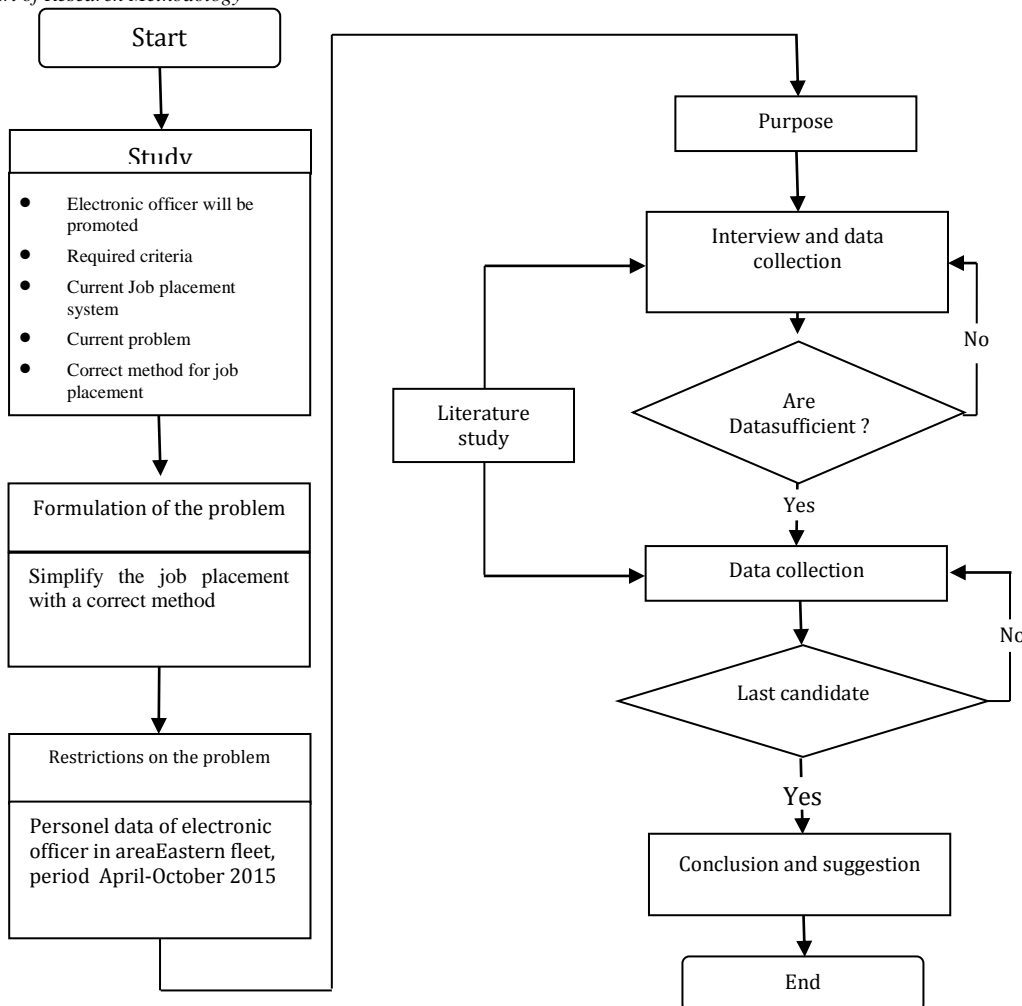


Figure 1. Flowchart of Research Methodology

3.2. Data processing and analyzing

After data collection is sufficient, then it's used for data processing with determined method.

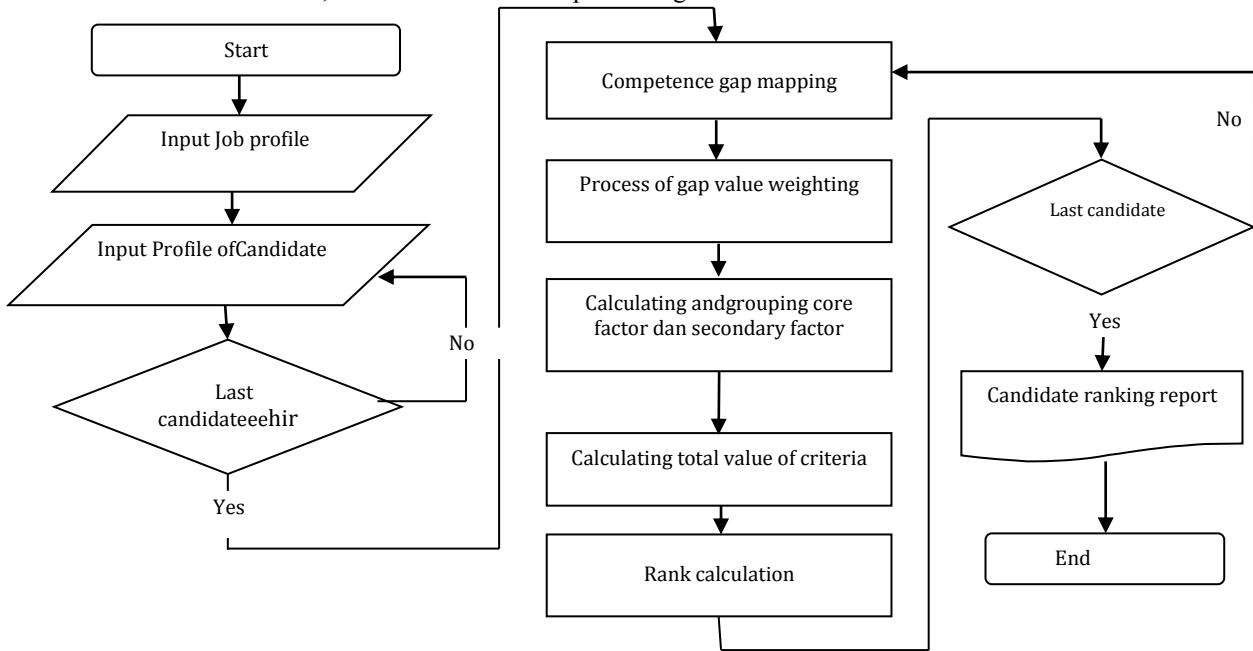


Figure 2. Flowchart of Data processing

a. Data Input

Compiling data input of criteria - criteria for job profiles and candidate profiles based on interviews and official data available in Disminpers Koarmatim. As for the personnel eligible to the Lieutenant Colonel job is electronic officer with the rank of Major and Lieutenant Colonel with the requirements as follows:

- 1) Data Criterion disposition is comprised of moral assessment results, assessment of dedication, discipline assessment, appraisal spirit / tenacity, loyalty ratings, ratings of honesty, military posture assessment, assessment of responsibility, self-assessment and valuation adjustments willingness to go forward.
- 2) Data Criteria Job Performance consisting of the results of leadership assessment, assessment of devotion, assessment of creativity, assessment of cooperation, assessment of comprehension, assessment of the ability to plan, assessment of the ability to decide, the fit of expression, assessment capability in implementing tasks and assessment of the ability of supervision / control ,
- 3) Additional data criteria consisting of the results of educational assessment, health assessment, assessment of physical fitness, psychological assessment, assessment weapons capability and electronic communications as well as assessment of official history.

b. Mapping Gap Criteria - Competence Criteria

Gap is the difference, or the difference between the profiles of prospective workers with occupational profiles. The guideline weights gap value is as follows:

Nb	Gap difference	Weight value	Remarks
1	0	4	Individual competence fully fulfilled
2	1	3.5	Individual competence 1 point upper the level
3	-1	3	Individual competence 1 point lower the level
4	2	2.5	Individual competence 2 point upper the level
5	-2	2	Individual competence 2 point lower the level
6	3	1.5	Individual competence 3 point upper the level
7	-3	1	Individual competence 3 point lower the level

Table1. Mapping of competence gap criteria

c. Gap Value mapping.

Here is an example of the weighting of gap value between job profile and Officer Candidate Profile.

d. Calculating core factor and secondary factor

Calculating the the sum of total score of core factor and secondary factor with formula:

$$\sum \text{Total score} = \sum \text{Weighting value} : \sum \text{Criteria}$$

e. Total Value Calculation Criteria

Total Value Calculation Each Aspect. The next step is to calculate the total value of each aspect based on the percentage of the core factors and secondary factors that affect the expected performance of each profile. To calculate the total value of each aspect, use the formula:

$$N = 60\% + 40\% \text{ NS NC}$$

N: Total Value of Each Aspect, NC: Core Value Factor, NS: Secondary Value Factor

For more details look at the following table

f. Ranking calculation Candidates

The final result of the profile matching process is the ranking of the candidates proposed to fill a particular position. A ranking refers to the calculation results shown in the formula below:

$$\text{Total value} = 30\% \text{ NK} + 40\% + 30\% \text{ NP NT}$$

NK: Total Value of Personality, NP: Total Value of Work Performance, NT: Additional Total Value.

g. Candidate Ranking Reports

The result of the calculation of the ranking of candidates that have been processed, then be submitted to the plenary session as the Job Placement Decision Makers.

4. STUDY

4.1 *Deciding Job Profil*

From interview and quisioner, we can conclude ideal profil of Electronic Officer like table below :

Number	Personality	Value				Description
		Less (1)	Enought (2)	Good (3)	Very Good (4)	
1	Morality			√		Good
2	Dedication			√		Good
3	Discipline			√		Good
4	Brave			√		Good
5	Loyalty			√		Good
6	Honestly			√		Good
7	Military attitude			√		Good
8	Responsibility				√	Very Good
9	Self Adaptation			√		Good
10	Developing will				√	Very Good

Table 2. Mean Value of Personality Criteria

Number	Job Achievement	Value				Description
		Less (1)	Enought (2)	Good (3)	Very Good (4)	
1	Leadership			√		Good
2	Devotion			√		Good
3	Creativity			√		Good
4	Cooperation			√		Good
5	Understanding Skill			√		Good
6	Planning Skill			√		Good
7	Deciding Skill			√		Good
8	Giving Opinion Skill			√		Good
9	Task Implementation Skill			√		Good
10	Monitoring Skill			√		Good

Table 3. Mean Value of Job Achievement Criteria

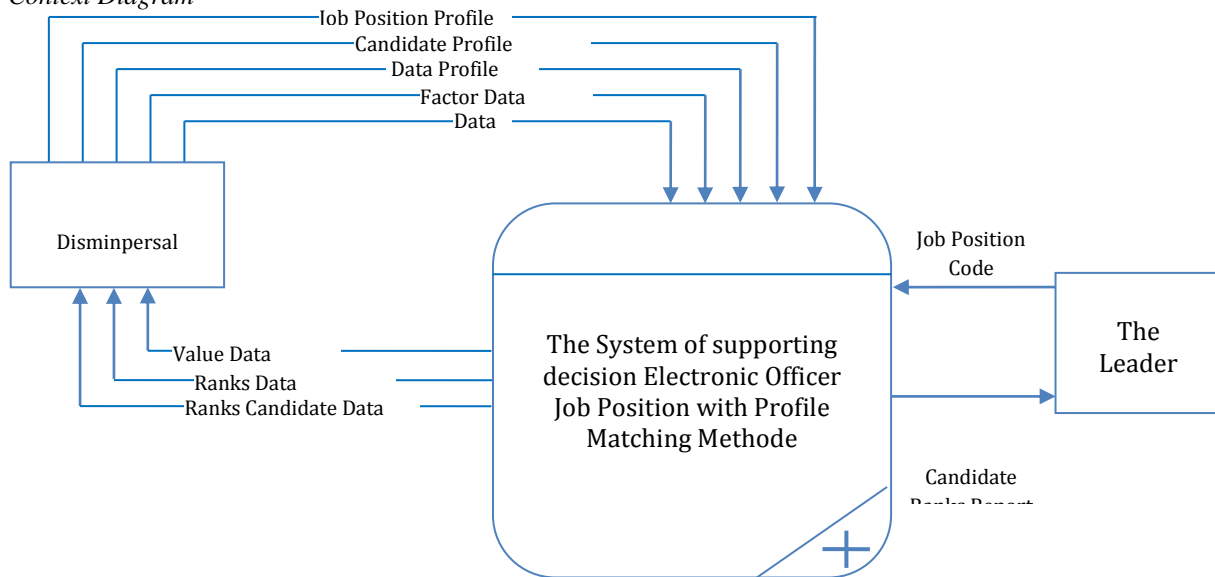
Number	Value of Additional Criteria	Value				Description
		Less (1)	Enough (2)	Good (3)	Very Good (4)	
1	Education					Very Good
	a. Electronic And Weapon Officer Specialization Training					
	b. Advanced Officer Training					
	c. Electronic Engineering Bachelor Degree of STTAL/other college					
	d. Command Training				√	
2	Health					Very Good
	a. Health Level III/IIP					
	b. Health Level IIP					
	c. Health Level II					
	d. Health Level I				√	
3	Physical					Good
	a. Less					
	b. Enough					
	c. Good			√		
	d. Very Good					
4	Psychology					Good
	a. Less					
	b. Enough					
	c. Good			√		
	d. Very Good					
5	Weapon, Communication, and Electronics Skill					Good
	a. Less					
	b. Enough					
	c. Good			√		
	d. Very Good					
6	Jobs History					Very Good
	a. Head of Electronics Division in Non Combatant Ship					
	b. Head of Electronics Department in Non Combatant Ship					
	c. Head of Electronics Division in Combatant Ship					
	d. Head of Electronics Department in Combatant Ship				√	

Table 4. Value Of Additional Criteria

4.2. The Designing System

Before make application program, the first thing to do is designing system. The purpose is to help the leader in taking decision, i.e. choose the candidate of Electronic Officer Job Position. The steps are designing flow system, Data Flow Diagram (DFD) and Entity Relationship Diagram (ERD) that use in application program.

4.2.1. Context Diagram



Picture 3. Context Diagram

This DFD context diagram describe general system that involves Disminpersal entity, The Head of Corps Unit, and The Head of Proffesion Unit also candidate. The system will give output result of Profile Matching (Candidate Ranks to the leader as additional component for positioning Electronic Officer Jobs.

4.3 Program Implementation and Test System

Program Implementation is application's step of analysis and designing system that make before. The software that created, developed with Visual Studio 2013

and SQL as database. Software and hardware must be prepared to running the program.

The hardware for running this application are Intel core i3 Processor, RAM 2 GB memory, 150 GB Hardisk, VGA, Keyboard and mouse while the software are Microsoft Window 7, Microsoft Visual Studio 2013, SQL Server Database (include in Microsoft Visual Studio 2013).

In this implementation program, there are steps in order to get ranks candidate data. The steps i.e. :

- a. Inputting Job Profile.
- b. Inputting Candidate Official.
- c. Registering Candidate Name.
- d. Calculating Ranks Candidate.

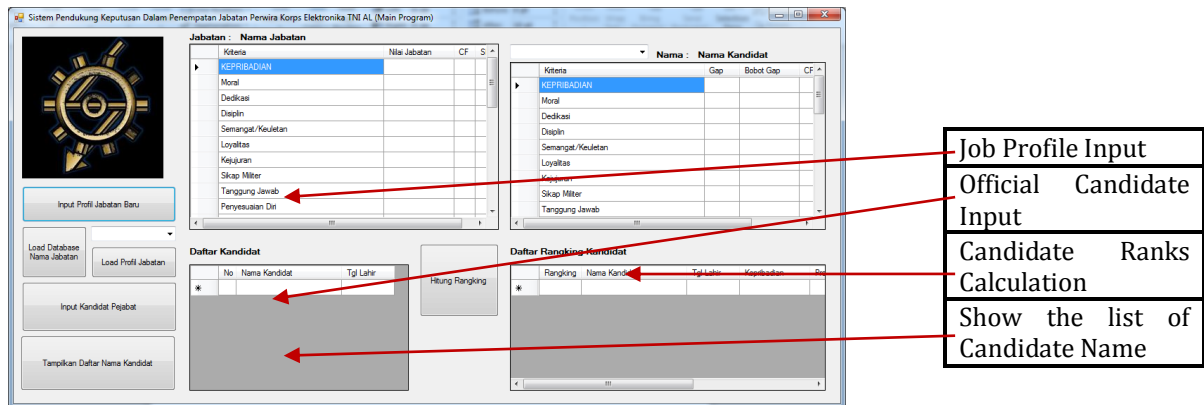
In Order to get the ranks of candidate, see the picture below :



Picture 4. The process to deciding Kasubdiharsewaco Job with Visual Studio 2013 program.

Picture 4 is a home screen of application that appear since program running. This part will describe Job Input process and candidate input. The step to running this program i.e. : open folder AppDatabase-v1_1, Click folder AppDatabase-

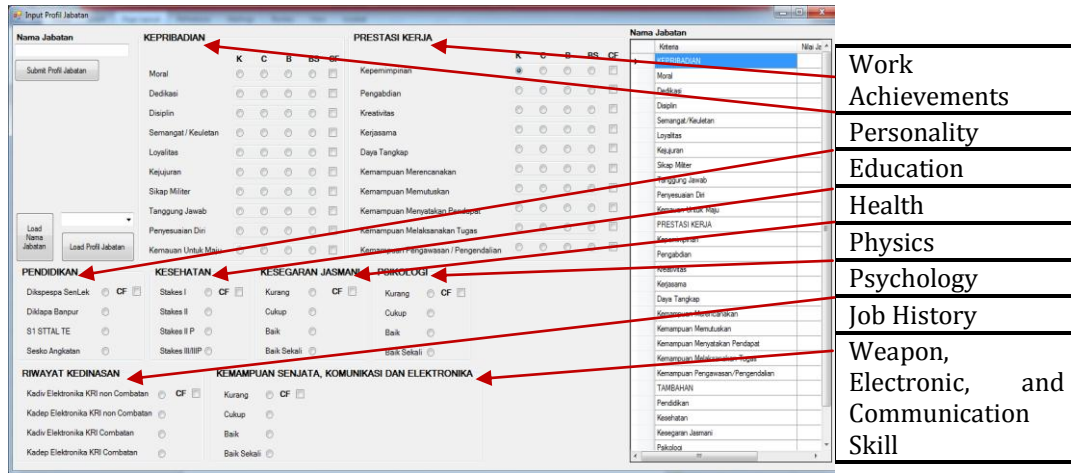
v1_1, Click folder AppDatabase, click bin, click Debug, click AppDataBase type Application, frame picture 4, then click "MASUK".



Picture 5. Job Profile Input, Official Candidate Input, The List of Candidate Name

After push enter button in home screen, there will appear new window (showed in picture 5) that is main program window. In picture 5, there are buttons part of main program i.e. : Job

profil input, Official Candidate Input, Show the list of Candidate name, Calculating the list of Ranks Candidate.



Picture 6. Input column of Job Profile.

In picture 6 window, the next step is User fill the new Job Profile Input (example : Kasubdiharsewaco Job). In this new Job Profile input, there are subsystem, i.e. : morality, dedication, discipline, brave, loyalty, honestly, military attitude, responsibility, self adaptation, developing will with level value (Less, Enough, Good, Very Good) and CF/SF value (Core Factor or Secondary Factor). The job achievements subsystem consist of leadership, devotion, creativity, cooperation, understanding skill, planning skill, deciding skill, giving opinion skill, task implementation skill, and monitoring skill with level value (Less, Enough, Good, Very Good) and CF/SF value (Core Factor or Secondary Factor). Additional subsystem consist of Command Training and value CF, Healthy status I and value CF, Physics good and value CF, psychology good

and value CF, weapon, communication and electronics good and value SF, also History job as Head of Electronic Department in combatant ship and value SF. The next step is inputting the value of criteria each candidate. In this trial, used criteria data from 30 Job candidate officer.

The last step from this trial is calculating the ranks from list. With using Profile matching methode, candidate data can be compared with job profile data. So, from each candidate there will be different value based on calculation. From this total value, there will be rangked from the highest to the lowest. The result of the rangked, show at table below.

Rangked	Candidate Name	Birth Date	Personality	Work Achievement	Additional	Total Value
1	SB43	19740405	3,610	3,829	3,850	3,769
2	AS41	19740306	3,629	3,800	3,850	3,764
3	AR45	19770205	3,824	3,914	3,500	3,763
4	ES43	19751206	3,714	3,743	3,700	3,721
5	JPAR 47	19790405	3,429	3,733	3,850	3,677
6	MAH 40	19710910	3,648	3,781	3,500	3,657
7	TWPK9	19790812	3,562	3,781	3,350	3,586
8	ISP47	19780708	3,262	3,781	3,500	3,541
9	AZS50	19820405	3,438	3,781	3,200	3,504
10	AF49	19810304	3,476	3,695	3,200	3,481
11	AR CP	19610307	3,295	3,476	2,250	3,054
12	SKM CP	19590405	3,257	3,257	2,250	2,955

Picture 7. Table Candidate Ranked

From the result of trial system, we obtained that the program running well. Beside that, the calculating process faster than manual system nowadays. Manual system must selection the candidate to do calculation above paper, write each data in candidate form, and calculating the rangked manually. The system in this research simplify candidate selection, do automatic calculation, showed the result of selection automatically, and false also showed the list of rangked candidate calculation fastly and precission. Also, with profile matching methode and deciding Core Factor and Secondary Factor so Subjectivity could be minimize to fill Job position.

5. CLOSING

5.1 Conclusion

From this research, there are conclusion, i.e. :

- The criteria of Electronic Officer to fill Job position are personality, work achievement criteria, and additional criteria.
- The Electronic Officer Job must fill with officer that has good personality, good work achievement, Command School history, has health status I, has good physics, weapon, communication, and electronic good skill, and also ever be a Head of Electronic Department in combatant ship.

c. With use software Decision Making with Profile Matching Methode, simplify the step to choosing Electronic Officer Job.

d. Compared with manual system, this software simplify Disminpersal to inputting candidate data, automatic calculation, listing the candidate automatically, and quickly, and also listing candidate ranked quickly and precision. Also, with profile matching metode and deciding Core Factor and Secondary Factor so Subjectivity could be minimize to fill Job position.

5.2 Suggestion

Based on research, there are some suggestion, i.e. :

a. This system developed as Supported system of Job Position in Navy officer

b. This system developed as Supported system in personnel recruitment.

c. This system developed as Supported system in advanced training school.

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