International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

http://ijpsat.ijsht-journals.org
Vol. 22 No. 1 August 2020, pp. 151-167

Decision Support System for Determination of Students Prakerin Places in SMK Negeri 3 Bogor Using Profile Matching Method

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Abstract – Decision Support System for determining the location of Industrial Work Practices (Prakerin) students using the profile matching method is a decision support system created to make it easy for the Chair of Expertise Competency (Kakomli) to match students and the Business / Industrial World (DU/DI) who have collaborated with the school in determining the appropriate Prakerin premises. Computer and Network Engineering (TKJ) Competency Competency at SMK Negeri 3 Bogor is the object of research related to the Prakerin planning activities for TKJ students who will implement it in semester 4 or class XI (eleven), which is matching student competencies and the needs of the Business World / Industrial World (DU/DI) where Internship is implemented by applying the profile matching method. The system development method used in this study uses the SDLC (System Development Life Cycle) waterfall model with stages ranging from analysis, design (design), implementation (coding), to testing. The result of this study is a decision support system for determining the place of internship of web-based students using a profile matching method in the form of student ranking based on the level of suitability of the value of criteria owned by students with the value criteria required by DU/DI to be placed and used as recommendations for decision making. With this decision support system, it can help provide choices in determining the location of the TKJ students by the competencies of each TKJ student and the needs of each appropriate Business World / Industrial World (DU/DI) accurately and quickly.

Keywords – Decision Support System, Determination of Student Internship Places, Prakerin, Profile Matching.

I. INTRODUCTION

Vocational High School (SMK) is a vocational education organization that has different characteristics from schools in general, namely, there are productive subjects and the implementation of Industrial Work Practices (Prakerin). Prakerin is part of the implementation of a dual system or a joint program between Vocational School and Industry that is carried out in the Business World / Industrial World and is one example of the implementation of the link and match concept. Prakerin is expected to be able to bridge and close the gap that occurs between the world of education and the business world [7]. In carrying out the Internship activities required proper planning by the school to determine the Internship location by the competencies of students and the needs of the Business World / Industrial World (DU / DI) where Internship is to be well planned, it is necessary to make decisions with the best alternative. With the rapid technological advances nowadays, so that decision making gets the best and easier alternative in processing its data by using an information system that supports in making a decision or called the Decision Support System (DSS). DSS can assist decision-making for decision-makers in assessing and determining the appropriate alternative placement of appropriate qualifications accurately and quickly [6].

SMK Negeri 3 Bogor as one of the vocational education institutions, in planning Prakerin students in semester 4 or class XI (eleven) often there are several obstacles including the Chairman of the Expertise Competency (Kakomli) still

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having difficulty in processing Prakerin planning data to match student competencies with the needs of the World Business / Industrial World (DU / DI) where Internship has cooperated with the school. As a result, the determination of the location of Prakerin is still a mismatch between the placement of Prakerin with the abilities of students, so students are not optimal in applying their abilities. Therefore, this reaserch uses the profile matching method in implementing a decision support system to make it easier to process the Prakerin planning data to match the competency profile of students with the DU / DI needs a profile in the Prakerin place.

II. Related Work

2.1 Prakerin

According to the 2008 Vocational Secondary Education, Industrial Work Practices are part of the learning program that must be carried out by every student in the World of Work, as a concrete manifestation of the implementation of the education system in Vocational Schools, the Dual System of Education [2]. Based on the SMK curriculum, according to the 2008 Vocational Secondary Education, it is stated that Internship is a pattern of education and training provider that is managed jointly between SMKs and industry / professional associations as Pair Institutions (IP), starting from the planning, implementation to evaluation and certification stages which constitute an integrated program by using various alternative forms of implementation [27].

According to the 2008 Vocational Secondary Education, the Prakerin Program implemented in the Industry / Company includes [2]:

a. Vocational basic practices can be carried out in part in the School, and in others in Industry, if the industry has training facilities in its Industry. If the industry does not have training facilities, then the basic practical vocational activities are carried out entirely in the School.
b. The practice of productive expertise, carried out in the industry in the form of on job training, takes the form of activities undertaking production or service work (actual work) in the industry/company by its expertise program.
c. Program arrangements 1 and 2 must be agreed at the beginning of the program by both parties.

According to the 2008 Vocational Secondary Education, the Prakerin Objectives implemented in the Industry / Company are as follows [2]:

a. Fulfillment of Competence by curriculum requirements.Mastery of competence with learning in schools is largely determined by the learning facilities available. If the availability of facilities is limited, the school needs to design competency learning outside the school (partner work world). The implementation of competency learning is not left entirely to the World of Work, but schools need to provide direction on what students should be taught.
b. Implementation of Competence in the World of Work. The abilities that students already have, through practice and practice in schools need to be implemented in a real way so that awareness grows that what they have is useful for themselves and others. That way students will be more confident because other people can understand what they understand and their knowledge is accepted by the community.
c. Growth of work ethic/work experience. Vocational Schools as educational institutions that are expected to deliver their graduates to the World of Work need to introduce the social environment prevailing in the World of Work. The experience of interacting with the world of work and being directly involved in it is expected to be able to develop work attitudes and personality as a whole as a worker.

2.2 Profile Matching Method

According to Kusrini, the profile matching method is a method that is often used as a mechanism in decision making by assuming that there are levels of the ideal predictor variables that must be met by the subject under study, rather than the minimum level that must be met or passed [10][13]. In the profile matching process, it is broadly a process of comparing the actual value of a profile to be assessed with the expected profile value, so that the competency differences (also called GAP) can be known, the smaller the GAP produced, the greater the value weights means there is a chance greater priority for student internship placement [9]. Following are the steps in the profile matching method [9], namely:

a. GAP Competency Mapping

Determine the competency GAP mapping variables and determine the aspects that will be used in processing grades. Then, calculate the results of the competency GAP mapping. The GAP referred to in this study is the difference between the profile criteria of students and the ideal profile (Prakerin place qualifications) with the following formula:

$$\boldsymbol{GAP} = Attribute\ Value - Target\ Value \quad (1)$$

b. GAP Weighting

After obtaining a GAP in each student, each student's profile is given a weighted value by referring to the value weights table which can be seen in Table 1.

Table 1. Weight of GAP value

No.	Gap	Value Weight	Explanation
1.	0	5	There is no difference (competency as needed)
2.	1	4,5	Individual competence is 1 level over
3.	-1	4	Individual competencies lack 1 level
4.	2	3,5	Individual competence 2 levels of excess
5.	-2	3	Individual competencies lack 2 levels
6.	3	2,5	Individual competence 3 levels of excess
7.	-3	2	Individual competencies lack 3 levels
8.	4	1,5	Individual competence 4 levels of excess
9.	-4	1	Individual competencies lack 4 levels

c. Calculation and Grouping Factors

Then each aspect is grouped into 2 groups, namely Core Factor (CF) and Secondary Factor (SF). Core factor calculations can use the following formula:

$$NCF = \frac{\text{NC}}{\text{IC}} \quad (2)$$

Explanation:
NCF = The average value of the core factor
NC = Total number of core factor values
IC = Number of core factor items

As for the secondary factor calculations, the following formula can be used:

$$NSF = \frac{\text{NS}}{\text{IS}} \quad (3)$$

Explanation:
NSF = The average value of the secondary factor
NS = Total number of secondary factor values
IS = Number of secondary factor items

d. Calculation of Total Value

After calculating each factor, then calculate the total value based on the percentage of core factors and secondary factors that are estimated to affect the performance of each profile. Calculation of the total value can be done by the formula:

$$N = (x)\%NCF + (x)\%NSF \quad (4)$$

Explanation:
N = Total value of aspects
NCF = The average value of the core factor

NSF = The average value of the secondary factor
(x)% = Percent value entered

e. Calculation of Ranking Determination

Finally, ranking calculations are done using the formula:

$$\boldsymbol{Ranking} = (x)\%N1 + (x)\%N2 + (x)\%N3 \quad (5)$$

Explanation:
N1, N2, N3 = Total aspect value calculated
(x)% = Percent value entered

III. Research Method

In this research, a decision support system will be built by combining the SDLC (System Development Life Cycle) waterfall model development method with the Profile Matching method, the steps for system development can be seen in the figure 1.

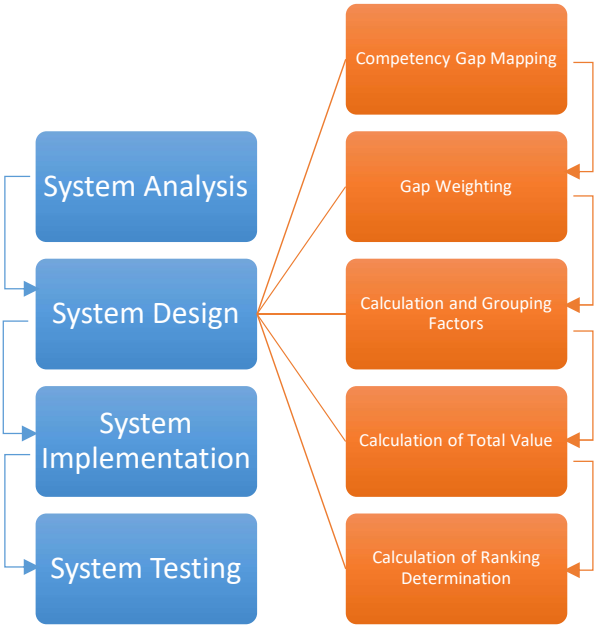

Figure 1. Research Stages

3.1 System Analysis

The initial stage is the system requirements analysis process. Researchers collect relevant data related to research by conducting interviews and observations at the research site. This stage is carried out to obtain information in the form of the results of the ongoing system analysis starting from procedures, needs, problems, and problem-solving proposals for the running system. At this stage, a flowchart is used to describe the running system procedure.

3.2 System Design

The design phase is the stage of translating requirements into a software representation, before starting the implementation in the program code. This stage is carried out to provide an overview in the form of a proposed system design which is divided into several designs namely:

a. Profile Matching Method Design
The design stage of the profile matching method is part of the application of one of the Decision Support System methods carried out in accordance with the steps in the profile matching method, namely competency GAP mapping, GAP weighting, calculation and factor grouping, calculation of total values, and calculation of ranking.

b. Unified Modeling Language (UML) Design
The design phase of the Unified Modeling Language (UML) is carried out to describe the design of the proposed system or new system that will be built logically without considering the physical environment by defining object-oriented general notation and semantics into several diagrams, namely use case diagrams, activity diagrams, classes diagrams, sequence diagrams, and collaboration diagrams.

c. Database Design
The database design stage is carried out modeling using the Entity-Relationship Diagram (ERD) to describe the relationships that occur from each entity and make file specifications of the database structure that will be used. A model of an organization's information needs that are used as a framework can be presented using ERD.

d. Interface Design

The interface design stage is carried out to design the system layout by the system requirements analysis. This stage is divided into two display designs, namely the input display design and the output display design.

3.3 System Implementation

The system implementation stage is the stage of decision support system development according to the results at the design stage. The implementation is carried out to build a decision support system for determining the place for student internships at SMK Negeri 3 Bogor using a web-based profile matching method.

3.4 System Testing

The system testing stage is the stage for finding errors in the system and finding out the suitability of the system being built with user needs.

IV. Experimental Results

4.1 Current System Procedures

The following is a systematic procedure for placing the Internship for TKJ students at SMK Negeri 3 Bogor:

a. In determining the place of Prakerin for Computer and Network Engineering (TKJ) students, Kakomli TKJ is assisted by TKJ Productive Teachers who are responsible for preparing data related to Internship planning.
b. TKJ Productive Teachers ask for report cards from TKJ homeroom teachers whose students will carry out Internships. Then, the Guardian of the TKJ Class will provide report cards for TKJ students who have Class X (ten) and Class XI (eleven) report cards in the odd semester to TKJ Productive Teachers.
c. After TKJ Productive Teachers receive all TKJ student report cards who will carry out Internship activities, then the value report card data are grouped into the XI class productive value criteria including sub-criteria for Computer and Basic Network scores, Basic Programming, Graphic Design, and Digital Simulation, the criteria for class XI productive scores includes the sub-criteria for the value of Network Infrastructure Administration, Network System Administration, WAN Technology, and Network Service Technology, as well as the criteria for student personality values including Morals, Discipline, Tidiness, and Cleanliness to list TKJ student scores.
d. Furthermore, the results of the grouped TKJ student score list will be given to the TKJ Kakomli.
e. Kakomli TKJ will analyze every productive value and personality value of TKJ students to be adjusted based on the experience of the needs of each Business World / Industrial World (DU / DI) where the Internship is held.
f. Then, Kakomli TKJ asked for consideration of the personality values of each TKJ student to each TKJ Productive Teacher who has ever taught tailored to the daily lives of TKJ students while in school.
g. Furthermore, Kakomli TKJ assigns each TKJ student to internship placement by estimating the placement based on the competence of each productive value and the personality value of each student with the experience of the needs of the Business World / Industrial World where the Internship is located. If there are students who have not been assigned, then Kakomli TKJ will return to place TKJ students with the Internship.
h. If each TKJ student has been placed with an internship, then the TKJ Kakomli will make a report on the internship placement of TKJ students and send the report via e-mail to the Deputy Head of the Hubinmas.
i. Furthermore, Kakomli TKJ printed a report on the internship placement of TKJ students to provide information to students who would carry out an Internship.

4.2 System Requirements

Based on the analysis of the current system procedures, it can be seen that the process of placing the Internship for TKJ students is carried out by Kakomli TKJ and TKJ Productive Teachers as the main users in the system. Some of the things that the system needs can be seen from the functional side of its users as follows:

a. Users can manage Internship planning data such as student data, DU / DI, student scores, and DU / DI needs scores for the matching process.
b. Users can match student competencies with the needs of the Business World / Industrial World where Internship is based on the criteria for class X productive scores including sub-criteria for Basic Computer and Network values, Basic Programming, Graphic Design, and Digital Simulation, the criteria for class XI productive values include sub-criteria for Network Infrastructure Administration scores, Network System Administration, WAN Technology, and Network Service Technology, as well as the criteria for student personality values, include Morals, Discipline, Tidiness, and Cleanliness.
c. Users can make decisions for the placement of Internships for TKJ students to suit the abilities of each student and the needs of each Business World / Industrial World.
d. Users can make reports on the placement of Prakerin TKJ students to be submitted to Wakasek Hubinmas.
e. Users can print TKJ student internship placement reports to provide information to students who will carry out Internships.

4.3 Profile Matching Method Design

The design of the profile matching method is intended to apply one of the Decision Support System methods into the proposed system to assist TKJ student internship placement in matching student competencies and DU / DI needs to provide alternative options for internship placement according to the abilities possessed by each student. The design of this method is done according to the manual calculation of the stages in the following profile matching method.

a. Mapping of Competency GAP

The initial step needs to determine in advance the competency GAP mapping variables and the aspects that will be used in processing the value. The variables that will be used in the decision support system for student internship placement are student data and data from the Business World / Industrial World (DU / DI). Student data to be used in this study were five samples of student data from Computer and Network Engineering (TKJ) which were a combination of two different classes. The following sample of student data that will be used in the decision support system of determining students' Internship can be seen in Table 2.

Table 2. Student Data Sample

NIS	Student Name	Class
171810006	Alan Fakih Pratama	XI TKJ 1
171810015	Daffa Darmawan	XI TKJ 1
171810032	Maulana Akbar	XI TKJ 1
171810024	Farih Khafiyyan	XI TKJ 2
171810057	Sahrul Reja	XI TKJ 2

Meanwhile, DU / DI data that will be used in this research is a sample of DU / DI data. The following is a sample of DU / DI data that will be used in the Decision Support System for determining student internship places, which can be seen in the Table 3.

Table 3. Sample data from Business World/Industrial World (DU/DI)

DU/DI Name	Tutor
PT Artha Sabena Putra (RS Azra)	Syamsiatin Fitriyah, A.Md.

The criteria and weight of the criteria used in processing the scores for student internship placement are shown in Table 4.

Table 4. Criteria and Criteria Weights

Criteria	Criteria Weight	Description
Productive Value 10	50%	Is the value of student productive subjects that have been obtained in semesters 1 and 2 or class X (ten)
Productive Value 11	20%	Represents the value of productive subjects that have been obtained in semester 3 or odd grade XI (eleven)

Personality Value	30%	It is the value of students daily attitudes during learning activities at school

Each criterion has several sub-criteria that are used to process scores for student internship placement as shown in Table 5.

Table 5. Criteria and Sub-Criteria

Criteria	Sub-Criteria	Name Abbreviati
Productive Value 10	Basic Computers and Networking	KJD
	Basic Programming	PMD
	Graphic Design	DSG
	Digital Simulation	SMG
Productive Value 11	Network Infrastructure	AIJ
	Network System Administration	ASJ
	WAN Technology	TNW
	Network Service Technology	TLJ
Personality Value	Morals	AKH
	Discipline	DIS
	Neatness	RAP
	Cleanliness	BER

After determining the competency GAP mapping variables and aspects that will be used in processing the scores, then calculating the results of the competency GAP mapping. The GAP in question is the difference between the student's criteria profile and the ideal profile (DU / DI criteria for Internship) using the formula:

GAP = Student Criteria Scores – DU/DI Criteria Scores

Following are the GAP calculations performed on each of the criteria used, for the GAP calculation of the Productive Value 10 criteria shown in Table 6.

Table 6. Calculation of GAP for the criteria of Productive Value 10

NIS	Student Name	Productive Value 10			
		KJD	PMD	DSG	SMG
171810006	Alan Fakih Pratama	4	4	4	5
171810015	Daffa Darmawan	4	5	5	5
171810032	Maulana Akbar	4	4	4	5

171810024	Farih Khafiyyan	4	4	4	5
171810057	Sahrul Reja	4	4	4	4
PT Artha Sabena Putra (RS Azra)		4	4	3	3
NIS	**Student Name**	**Productive Value 10**			
		KJD	**PMD**	**DSG**	**SMG**
171810006	Alan Fakih Pratama	0	0	1	2
171810015	Daffa Darmawan	0	1	2	2
171810032	Maulana Akbar	0	0	1	2
171810024	Farih Khafiyyan	0	0	1	2
171810057	Sahrul Reja	0	0	1	1

GAP calculation of Earning Value 11 criteria can be seen in Table 7.

Table 7. Calculation of GAP for the criteria of Productive Value 11

NIS	**Student Name**	**Productive Value 11**			
		AIJ	**ASJ**	**TNW**	**TLJ**
171810006	Alan Fakih Pratama	4	4	4	4
171810015	Daffa Darmawan	5	5	5	4
171810032	Maulana Akbar	4	4	4	4
171810024	Farih Khafiyyan	5	5	5	4
171810057	Sahrul Reja	4	4	5	4
PT Artha Sabena Putra (RS Azra)		4	4	4	3
NIS	**Student Name**	**Productive Value 11**			
		AIJ	**ASJ**	**TNW**	**TLJ**
171810006	Alan Fakih Pratama	0	0	0	1
171810015	Daffa Darmawan	1	1	1	1

The GAP calculation for the Personality Value criteria can be seen in the table 8.

Table 8. Calculation of GAP for the criteria of Personality Value

NIS	**Student Name**	**Personality Value**			
		AKH	**DIS**	**RAP**	**BER**
171810006	Alan Fakih Pratama	4	4	4	4
171810015	Daffa Darmawan	5	5	4	4

171810032	Maulana Akbar	5	4	4	4
171810024	Farih Khafiyyan	5	5	4	4
171810057	Sahrul Reja	4	4	4	4
PT Artha Sabena Putra (RS Azra)		5	5	5	5

NIS	Student Name	Personality Value			
		AKH	DIS	RAP	BER
171810006	Alan Fakih Pratama	-1	-1	-1	-1
171810015	Daffa Darmawan	0	0	-1	-1
171810032	Maulana Akbar	0	-1	-1	-1
171810024	Farih Khafiyyan	0	0	-1	-1
171810057	Sahrul Reja	-1	-1	-1	-1

b. GAP Weighting

After obtaining GAP for each student, each student's profile is given a weighted value regarding the table of weighting the GAP score in Table 1 then weighting the GAP on each criterion, for the GAP weighting criteria Productive Value 10 can be seen in the table 9.

Table 9. GAP weighting for the criteria of Productive Value 10

NIS	Student Name	Productive Value 10			
		KJD	PMD	DSG	SMG
171810006	Alan Fakih Pratama	0	0	1	2
171810015	Daffa Darmawan	0	1	2	2
171810032	Maulana Akbar	0	0	1	2
171810024	Farih Khafiyyan	0	0	1	2
171810057	Sahrul Reja	0	0	1	1

GAP Weight Value

NIS	Nama Siswa	Productive Value 10			
		KJD	PMD	DSG	SMG
171810006	Alan Fakih Pratama	5	5	4,5	3,5
171810015	Daffa Darmawan	5	4,5	3,5	3,5
171810032	Maulana Akbar	5	5	4,5	3,5
171810024	Farih Khafiyyan	5	5	4,5	3,5
171810057	Sahrul Reja	5	5	4,5	4,5

GAP weighting of Earning Value 11 criteria can be seen in the table 10.

Table 10. GAP weighting for the criteria of Productive Value 11

NIS	Student Name	Productive Value 11			
		AIJ	ASJ	TNW	TLJ
171810006	Alan Fakih Pratama	0	0	0	1
171810015	Daffa Darmawan	1	1	1	1
171810032	Maulana Akbar	0	0	0	1
171810024	Farih Khafiyyan	1	1	1	1
171810057	Sahrul Reja	0	0	1	1

GAP Weight Value

NIS	**Student Name**	**Productive Value 11**			
		AIJ	**ASJ**	**TNW**	**TLJ**
171810006	Alan Fakih Pratama	5	5	5	4,5
171810015	Daffa Darmawan	4,5	4,5	4,5	4,5
171810032	Maulana Akbar	5	5	5	4,5
171810024	Farih Khafiyyan	4,5	4,5	4,5	4,5
171810057	Sahrul Reja	5	5	4,5	4,5

The weighting of the GAP Personality Value criteria can be seen in the table 11.

Table 11. GAP weighting for the criteria of Personality Value

NIS	**Student Name**	**Personality Value**			
		AKH	**DIS**	**RAP**	**BER**
171810006	Alan Fakih Pratama	-1	-1	-1	-1
171810015	Daffa Darmawan	0	0	-1	-1
171810032	Maulana Akbar	0	-1	-1	-1
171810024	Farih Khafiyyan	0	0	-1	-1
171810057	Sahrul Reja	-1	-1	-1	-1

GAP Weight Value

NIS	**Student Name**	**Personality Value**			
		AKH	**DIS**	**RAP**	**BER**
171810006	Alan Fakih Pratama	4	4	4	4
171810015	Daffa Darmawan	5	5	4	4
171810032	Maulana Akbar	5	4	4	4
171810024	Farih Khafiyyan	5	5	4	4

171810057	Sahrul Reja	4	4	4	4

c. Calculation and Grouping of Factors

Then grouping each criterion into 2 groups, namely Core Factor (CF) and Secondary Factor (SF) from each subcriteria. The formula used to calculate the core factor (NCF) and secondary factor (NSF) is as follows:

$$NCF = \frac{\text{NC}}{\text{IC}} \quad \text{and} \quad NSF = \frac{\text{NS}}{\text{IS}}$$

The sub-criteria group is used as a Core Factor and Secondary Factor for each criterion shown in Table 12.

Table 12. Grouping Sub-Criteria Factors

Criteria	Sub-Criteria	Factor
Productive Value 10	Basic Computers and Networking	CF
	Basic Programming	SF
	Graphic Design	CF
	Digital Simulation	SF
Productive Value 11	Network Infrastructure Administration	SF
	Network System Administration	CF
	WAN Technology	SF
	Network Service Technology	CF
Personality Value	Morals	CF
	Discipline	CF
	Neatness	SF
	Cleanliness	SF

The grouping of factors was determined by Kakomli based on previous experience in determining the internship place. Core Factor (CF) or the main factor is a sub-criterion chosen because more student competencies and DU / DI needs are taken into consideration for the Internship placement. Meanwhile, Secondary Factor (SF) or supporting factors are the selected sub-criteria because of the lack of student competencies and the need for DU / DI which is used as consideration for internship placement. From the calculation results of NCF and NSF can be seen in the table 13.

Tabel 13. Calculation of the factor of the Productive Value 10

NIS	Student Name	Productive Value 10	
		Core Factor	*Secondary Factor*
171810006	Alan Fakih Pratama	4,75	4,25

171810015	Daffa Darmawan	4,25	4
171810032	Maulana Akbar	4,75	4,25
171810024	Farih Khafiyyan	4,75	4,25
171810057	Sahrul Reja	4,75	4,75

Tabel 14. Calculation of the factor of the Productive Value 11

NIS	Student Name	Productive Value 11	
		Core Factor	*Secondary Factor*
171810006	Alan Fakih Pratama	4,75	5
171810015	Daffa Darmawan	4,5	4,5
171810032	Maulana Akbar	4,75	5
171810024	Farih Khafiyyan	4,5	4,5
171810057	Sahrul Reja	4,75	4,75

Tabel 15. Calculation of the factor of the Personality Value

NIS	Student Name	Personality Value	
		Core Factor	*Secondary Factor*
171810006	Alan Fakih Pratama	4	4
171810015	Daffa Darmawan	5	4
171810032	Maulana Akbar	4,5	4
171810024	Farih Khafiyyan	5	4
171810057	Sahrul Reja	4	4

d. Total Value Calculation

After calculating each factor, then calculate the total value based on the percentage of the core factor and the secondary factor. The total value is calculated using the formula:

$$N = (x)\%NCF + (x)\%NSF$$

Tabel 16. Calculation of the total value of each criterion

NIS	Student Name	NNP10	NNP11	NNK
171810006	Alan Fakih Pratama	4,55	4,85	4
171810015	Daffa Darmawan	4,15	4,5	4,6
171810032	Maulana Akbar	4,55	4,85	4,3
171810024	Farih Khafiyyan	4,55	4,5	4,6
171810057	Sahrul Reja	4,75	4,75	4

e. Ranking Determination Calculation

Finally, after obtaining the total value for each criterion, the ranking calculation is carried out using the formula:

$$\boldsymbol{Ranking} = (x)\%N1 + (x)\%N2 + (x)\%N3$$

Then the ranking results are obtained which can be seen in the following table.

Table 17. Calculation of the ranking of each student

NIS	Student Name	*Ranking*
171810006	Alan Fakih Pratama	4,445
171810015	Daffa Darmawan	4,355
171810032	Maulana Akbar	4,535
171810024	Farih Khafiyyan	4,555
171810057	Sahrul Reja	4,525

After calculating the ranking of each student, then determining the ranking of each student by sorting the results of the ranking calculation from the highest to the lowest score. The following are the results of determining the ranking of each student which can be seen in the table 18.

Table 18. Ranking Results

NIS	Student Name	*Rankin*
171810024	Farih Khafiyyan	1
171810032	Maulana Akbar	2
171810057	Sahrul Reja	3
171810006	Alan Fakih Pratama	4
171810015	Daffa Darmawan	5

From the results obtained, the student with the highest ranking is the result of matching the competency profile of the student with the DU / DI needs a profile so that DU / DI will be used as a choice for the placement of student internship.

4.4 System Design

The following is a use case diagram of the decision support system for determining student internship places using the profile matching method shown in Figure 2.

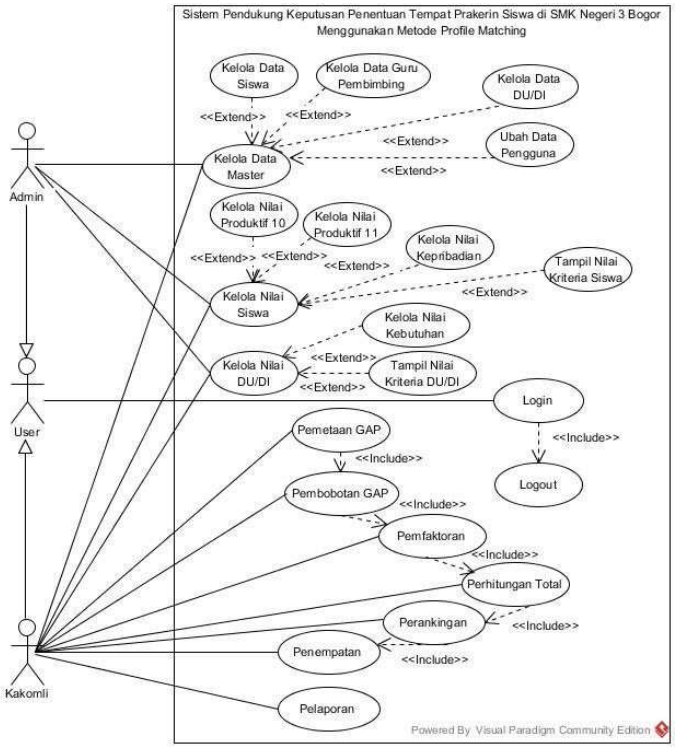

Figure 2. Use case diagrams of student Prakerin placement Decision Support Systems

The following is the Entity-Relationship Diagram of the DSS for Student Prakerin placement as can be seen in the figure 3.

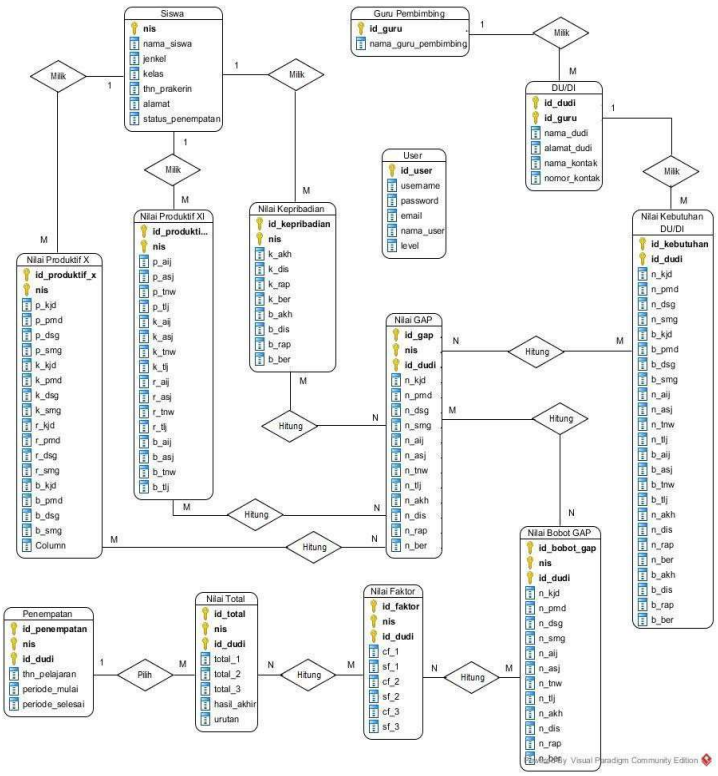

Figure 3. ERD Student Prakerin Placement Decision Support Systems

4.5 System Implementation and Testing

In implementing the Decision Support System application to determine the Internship of students using the profile matching method, the step taken by the researcher is coding the program. Coding this application program is made using the PHP programming language and MySQL database. The software used is the text editor Notepad ++ and Sublime Text 3 in building program code. As for running this application, a web server and web browser are needed, namely using XAMPP and Google Chrome software which are run on the Windows 7 Professional Operating System. Below are two examples of screenshots from the Student Prakerin Placement Decision Support Systems in figure 4 and figure 5.

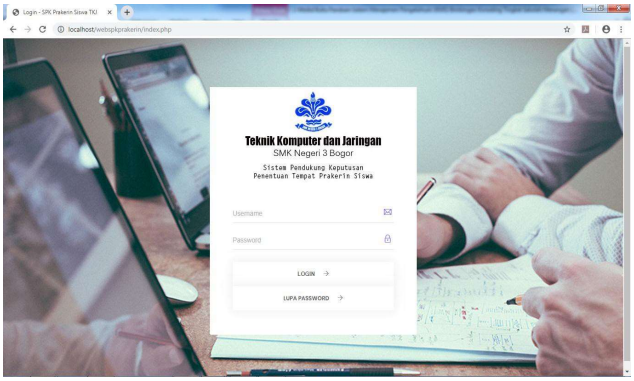

Figure 4. Login Page

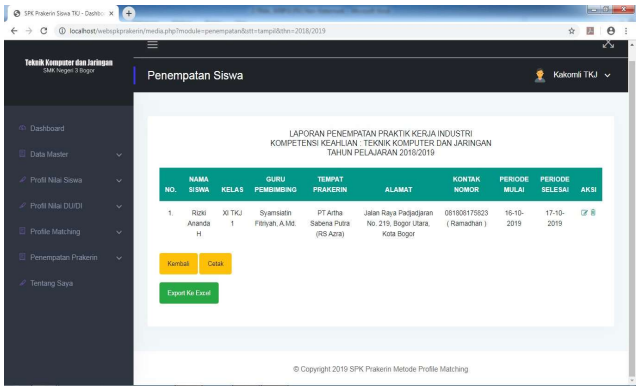

Figure 5. The results page displays placement data

V. CONCLUSION

Based on the results and discussion, the following conclusions can be drawn: The profile matching method can be used to solve the problem of the process of matching student competencies and the needs of the Business World / Industrial World (DU / DI) where the internship is by the competence of each student and the needs of each DU / DI. Decision support system applications using the profile matching method can provide a choice of DU / DI to determine the placement of student internships from the ranking results with the highest order of 5 in each DU / DI. This system is only a decision-making tool so that the final decision is still determined by Kakomli.

For further development of the application of a decision support system that has been implemented, modules or features of criteria and sub-criteria can be added to make it easier if it is likely that there will be changes in components and the value weights used in the assessment and matching process. For further research, it can involve the Business World / Industrial World (DU / DI) where the Internship is related to needs assessment, either directly, namely by providing access rights to input the value of needs or indirectly, namely by requesting a needs assessment from the DU / DI parties concerned. , so that the needs assessment can be more objective and by the conditions of the needs of each DU / DI.

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