Decision Support System Selection of Study Programs STMIK Muhammadiyah Banten's New Students with the Fuzzy Method

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Abstract—**The mistake in choosing a study program on a campus is a very serious thing where every student who has taken a course of study on a campus and in the middle of the semester the student feels wrong in choosing a major this impact will have an impact on these students so they cannot follow the lessons well and finally resign the study program is a concentration that will be taken by each student this study program will determine where the knowledge or lessons will be taken by students at this time many students are only choosing study programs based on friends or just follow the existing trend, not based on academic value or skills.So that every year there are some students who discontinue lectures because they do not understand the lessons delivered. Researchers aim to make applications with fuzzy methods can create targets for prospective bus students a successful and can choose study programs according to academic or non-academic values that are processed by the system to generate information advice for students taking study programs, designed using PHP and Mysql because it is very easy to configure.**

Keywords: fuzzy method, study program selection, PHP and Mysql

I. INTRODUCTION

The selection of study programs is very important in learning at a university or college where the study program will be connected with employment opportunities after graduating from college this is very important because there are some people who choose the study program only limited to following their friends in choosing a study program while the person study program will lead to what subjects and opportunities in the world of work such as in choosing a study program contains long-term consequences and some significant sacrifices ranging from time.Energy and mental readiness where in choosing the wrong study program tends negative effects in the future one of which is unemployment due to not being able to compete with market demand associated with study programs taken at tertiary institutions especially IT study programs where many IT study program students do not work with study programs while in college in Stmik Muhammmdiyah Banten there are 5 to 10 people per class resign or stop the campus because of unclear whether to continue studying again or not, after being asked and by the campus the students felt the wrong study program and could not follow the lessons taught

A. Fuzzy Logic

Fuzzy logic (fuzzy logic) is one branch of AI (artificial intelligence). Fuzzy logic is a modification of set theory where each member has a degree of membership that has a continuous value between 0 to 1. Since it was first discovered by Lotfi A. Zadeh in 1965, fuzzy logic has been used in a wide range of problem domains, such as process control, classification and pattern matching, management and decision making and others.

According to Sri Kusuma Dewi, fuzzy logic is one of the components forming Soft Computing. The basis of fuzzy logic is fuzzy set theory. In fuzzy set theory, the role of the degree of membership as a determinant of the existence of elements in a set is very important. The value of membership or the degree of membership or membership function becomes the main characteristic of reasoning with fuzzy logic (Kusumadewi S, Purnomo H, 2010).

B. Fuzzy Association

In fuzzy logic theory known as fuzzy sets (fuzzy sets) which is a grouping of things based on language variables (linguistic variables), which is stated in the membership function, in the universe of discourse, the membership function of a fuzzy set is valued from 0 to 1 .Examples of the set of language variables, among others
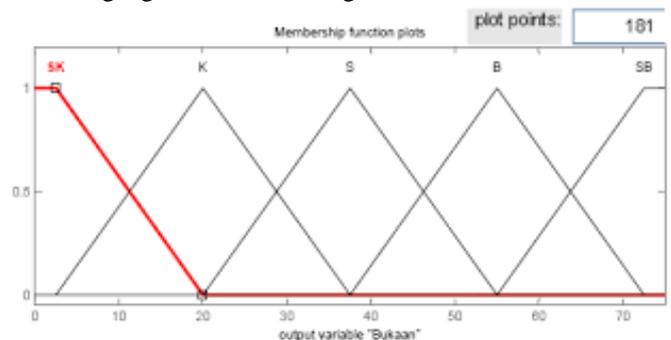

Figure 1. Sample Membership Fuzzy

Resistant is very appropriate to be used in the process of finding precise and accurate data [3]. The resistant method consists of stages, namely:Describe the membership function Membership function (membership function) is a curve that shows the mapping of data input points into the value of membership (often also called the degree of membership) which has an internal between 0 to 1.one of the ways that can be used to get membership values is through the function approach.

1) Fuzzification

Fuzzification is the first phase of fuzzy calculation, i.e. converting firm values to fuzzy values. The process is as follows: An analog quantity is entered as an input (crisp input), then the input is entered at the scope of the membership function. This membership function is usually called the membership function input. The output of this fuzzification process is a fuzzy input value or what is usually called a fuzzy input.

2) Fuzzification Query

Fuzzification Queries are assumed to be a conventional (nonfuzzy) DBMS query that will try to create and implement a basic system of fuzzy logic queries.

3) Zadeh's Basic Operators for Fuzzy Set Operations.

The membership value as of 2 fuzzy sets is known as Fire Strength or α-predicate. It is very possible to use basic operators in the query process in the form of AND and OR operators. α predicate as a result of operations with the AND operator is obtained by taking the smallest membership value between elements in the set concerned, denoted: μAB = min (μA [x], μB [x]).

II. RESEARCH METHODS

The design of the decision making application used is Agile model methodology. Agile software development allows a process model that is tolerant of change requirements so that responses to changes can be made more quickly

IPA   Step 1 Function membership

$$\mu Bad = \begin{cases} 1 \ x \ \le 0 \\ \frac{50-x}{50-0} \quad 0 \le x \le 50 \\ 0 \ x \ \ge 50 \end{cases}$$

III. RESULT AND DISCUSSION

A. Function Implications

Fuzzy According to Chen & Pham (2001), the value of membership as a result of operating two or more sets of functions of the Min implication is defined as follows:

$$\propto -predikat_i = \mu_{A_1[x_1] \cap \ldots \cap A_n[x_n]}$$
$$= min(\mu_{A_1}[x_1], \ldots \ldots, \mu_{A_n}[x_n])$$

dimana, i adalah aturan fuzzy ke-i.

B. Defuzzification process

According to Ross (2010), the process of determining the central point of a fuzzy area done using the formulation:

$$z^* = \frac{\int_z \mu(z)z \, dz}{\int_z \mu(z) \, dz}$$

For discrete domains, with:

Z = affirmation result value (defuzzification)

di = output value in the i rule

UAi di = degree of membership of the output value in the i-th rule
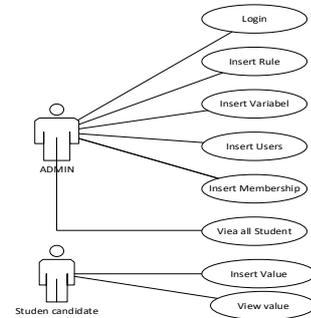
n = number of rules used

Figure 2 - Use Case

1) Subject Criteria

Subject criteria are a condition for making decisions based on the value of these subjects

TABLE 1. VARIABEL TABLE

No	name_variabel
1	IPA
2	Computer
3	B.inggris
4	Skill
6	MTK
7	SI
8	MI
9	TI

2) Criteria Rule

The rule criterion serves to determine what results are in accordance with the wishes, where each student kiteria input into the rule in order to get the desired results right

TABLE 2. TABLE RULE

No	Name_Criteria	Under	Middle	Above	Description
1	IPA_Bad	0	10	50	Bad
2	IPA_Middle	30	50	80	Middle
3	IPA_Well	70	90	100	Well

3) Weighting

This weighting is the weighting of each criterion. Based on my understanding, this weighting is weighting a criterion

TABLE 3. WEIGHTING TABLES

	IPA	Computer	Inggris	Skill	MTK
BAGUS KURNIAWAN	60	82	68	70	77
Muhamad hakiki	83	79	72	66	85
RANIAH	67	68	74	68	73

TABLE 4. OUTPUT TABLES

No	Study Program	Lower Value	Middle Value	Top Value	Description
1	Sistem informasi	71	85	100	Recommendation
2	Teknik Informasi	61	60	70	Recommendation
3	Manajemen informasi	40	50	60	Recommendation

$$z^* = \frac{\int_z \mu(z)z\,dz}{\int_z \mu(z)\,dz}$$

Smallest Membership Value   = -0.74

Biggest Membership Value   = 2.55

Value a1   =-99.35

A2 value   =153.98

A1 value   Moment 1= -3652.056325

A2 value   Moment 2=-26969.352673667

A3 value   Moment 3=0

Area 1= 73.519

Area 2=-343.19635

Area 3=0

Z1 .-30621.408998667

Z2 -269.67735

Z =   Recommendations **Tenik Informasi**

Lack of recommendations **Manajemen Informasi**

Majors are not recommendations **Sistem Informasi**

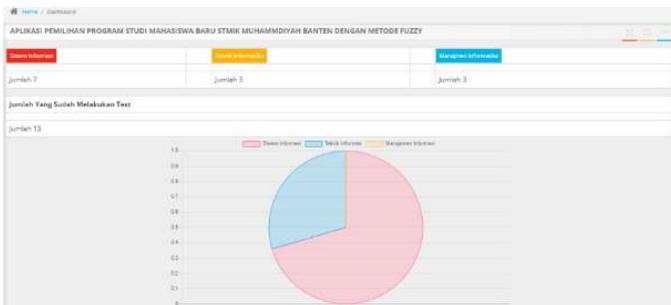Figure 3. The results of the program

Figure 4 - Dashboard

Here is the front page of the application after the user login will be faced with a home menu where the home menu contains menus for the next page

Figure 5. Student Status Dashboard

This application provides a dashboard to facilitate decision making based on the study program, the status of students who are currently active on campus, are no longer active

IV. CONCLUSIONS

Based on the results of research conducted at STMIK Muhammdiyah Banten on the Selection of Study Programs at STMIK Muhammdiyah Banten, it can be concluded that:

- Decision support system for the determination of Study Program Selection at STMIK Muhammadiyah Banten using the fuzzy method has been successfully created. Where prospective new students use the application to get references for study programs
- The system can provide convenience in the study program so that prospective students have an image for the study program
- Decision support systems using the fuzzy method have been proven to be used for decision making in selecting study programs
- From the results of this study the leadership can find out the status information of students each period
- With the decision support system for determining the Program Selection can help in getting information faster.

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