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Determination of Qualified Human Resources Using The ANFIS Method

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Abstract: In improving the quality of education is very closely related to the problem of human resources. One of the main keys in creating professional human resources lies in the process of recruitment, selection and workforce training. Finding a professional and qualified workforce is not easy and is a must in an organization or university in screening new employees or lecturers. Therefore we need a system for organizations and universities to be able to get the right people, qualified and placed according to their abilities. This research was conducted using quantitative descriptive research methods and data collection methods in the form of questionnaires and using the Adaptive Neuro-Fuzzy Inference System (ANFIS) algorithm. From the results of testing the data this algorithm shows a data accuracy rate of 77 percent which will provide the required output. Anfis combines the working principles of an Artificial Neural Network (ANN) with a Fuzzy Inference System (FIS). Anfis is able to process numeric numbers, as well as knowledge based on language (linguistics). In addition, ANFIS is more transparent to users than ANN which is like a black box. This is because the rules processed by ANFIS can be known by the user. However, most research shows that ANN is more accurate than ANFIS. Between the two types of FIS (mamdani and sugeno), for ANFIS sugeno is more recommended because the process is faster. This method is covered with Matlab application proof to see how far the results are obtained from the processing of the Anfis method.

Keywords: HR, ANFIS, questionnaire, quantitative description

INTRODUCTION

University is an educational institution normatively responsible for quality individuals so that they become superior human beings.The spearhead of a university is the lecturer who one of the essential components in a higher education system.Roles, duties, and responsibilities are very important in realizing national education, namely educating the life of the nation, improving the quality of Indonesian people,which includes the quality of faith/piety, noble character, and mastery of science, technology and art, as well as realizing an advanced, just, prosperous and civilized Indonesian society.

To determine quality human resources in tertiary institutions, an in-depth analysis is needed to maximize the results of ANFIS implementation in determining the best human resources with the ANFIS algorithm.The purpose of this research is to find out which human resources are better and better, especially lecturers who play a role in educating the life of the nation.

UNPRI is a prime university engaged in education, UNPRI has several faculties, one of which is the faculty of technology and computer science.UNPRI has many qualified and certified staff and lecturers, in recent years the performance of many lecturers has helped UNPRI achieve success,UNPRI wants to give rewards to employees who have contributed to the campus, but it is difficult to determine the quality of human resource because everyone is working hard.Therefore the writer wants to analyze the problems that occur by determining the criteria that are applied by the ANFIS method through the best HRD performance to determine quality staff and lecturers.

METHOD

To obtain data in this study, the writers require several techniques, namely:

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Interview
The interview was conducted by asking directly the staff/employees at the University of Prima Indonesia .The interview was conducted when the staff/BAA was having a break. The tools and materials are used writing instruments, recorders (smartphones) and notebooks. Apart from staff/BAA, the writer also conducted interviews with students and also the lecturers, we met.

Questionnaire
The survey was carried out by distributing questionnaires in the form of a Google form to the staff/BAA, students and lecturers. Questionnaires were distributed using a social media platform in the form of Whatsapp .

Observation or Direct Observation
The writer visited the HRD section on the University of Prima Indonesia to find out the process of the recruitment, selection, and the work placement of university lecturers and staff.

Library Studies
Gather information from writings that support discussions related to the recruitment process, selection, and job placement of college lecturers and staff.

RESULT

After being tested, the results show the comparison between the output and ANFIS results. The level of accuracy of the data in this study is calculated based on the output with ANFIS results.Based on the calculation results, it was found that the level of accuracy the data in this study was 77% percent as shown in Figure 4.1

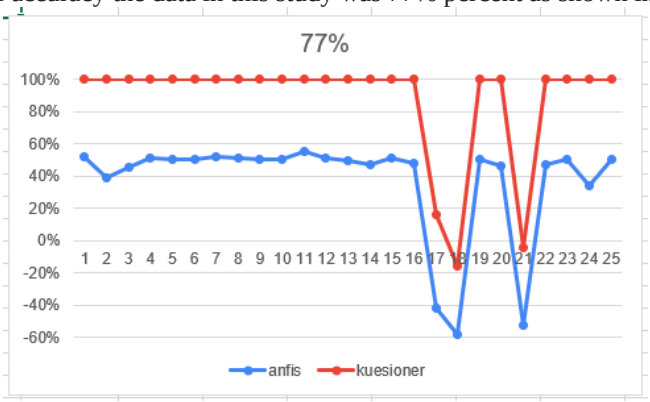

Figure. 4.1. Comparison of actual predicted value and ANFIS

DISCUSSIONS

The data source was obtained from the results of the questionnaires distributed. Each answer is given a value of one to five according to the answers that are then added up. There are 4 variables and they are divided into input variables and output variables.Input variables consist of selection, salary, and performance.The output variable is recruitment.After obtaining the total value of each variable, the data will be tested.First of all load data to carry out training data in the application as shown in Figure 4.2

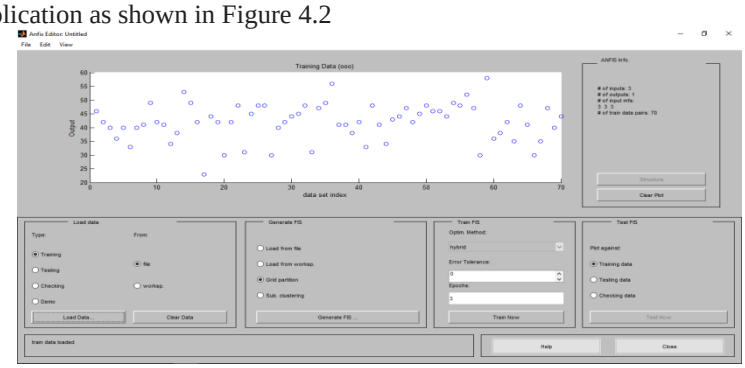

Figure.4.2. Load Data

The ANFIS structure consists of 5 layers.The first layer has 5 inputs. The second layer is Fuzzy fixation or the process of mapping crisp (numeric) values into fuzzy sets and determining the degree of their membership in the fuzzy sets.in processing this data every single input has three membership functions.The third

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layer is the determination of weights.The fourth layer is the normalization of the weights, and the last one is Defuzzyfication.The 5 layers can be seen in Figure 4.3

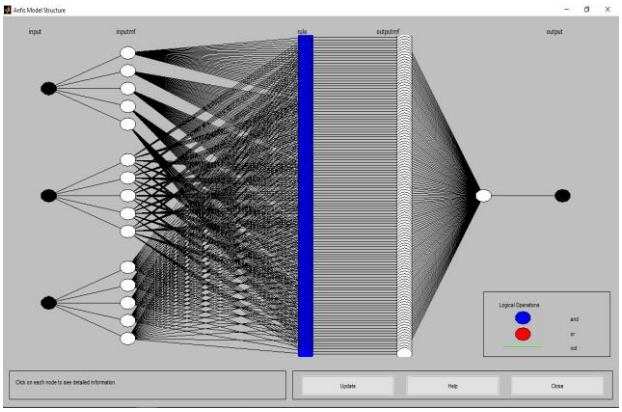

Figure 4.3. ANFIS structure

After the data has been loaded and the ANFIS structure is in place, a training error is performed on data with an epoch size of 100 which is performed 2 times with 50 epochs training errors for each training error as shown in Figure 4.4.

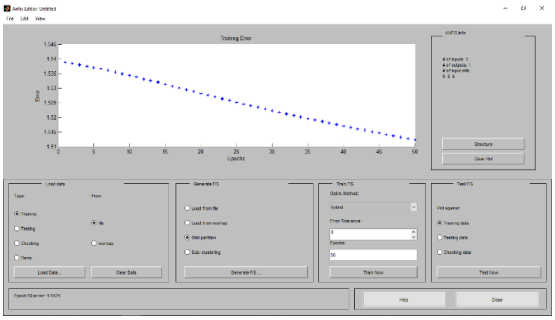

Figure 4.4. Training Error with Epochs 50

After the data is tested and the root mean square error shows a value close to zero,then the next stage is to conduct data training as shown in Figure 4.5

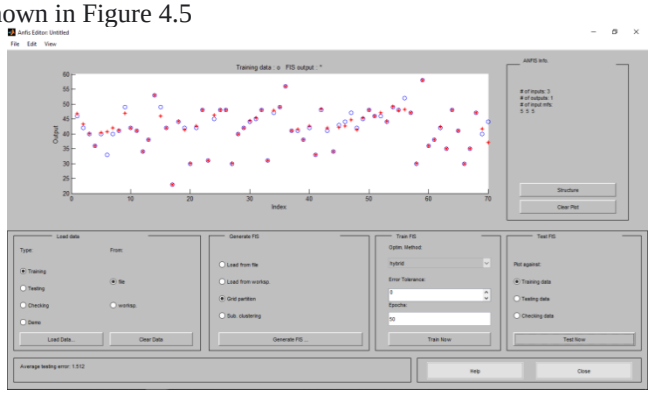

Figure 4.5. Data Training Results

The ANFIS used using the Sugeno method in which there are five inputs andone output on the fuzzy interface with variables namely performance appraisal,work motivation, facilities and work environment,responsibility and competency As well as each variable has three neuro,
namely dissatisfied, quite satisfied, and satisfied as shown in Figure 4.6

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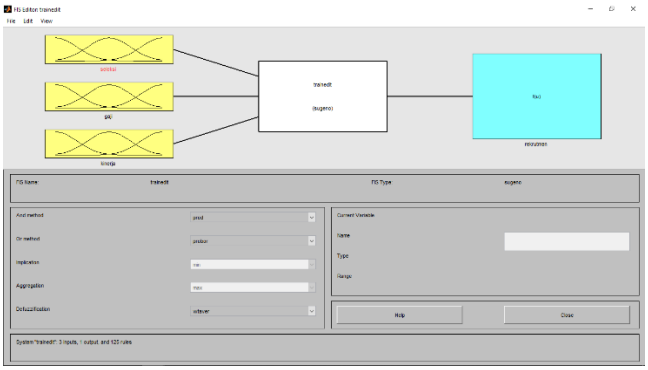

Figure 4.6. Anfis System Input Output Design

From the combination of the five inputs to the class of each dependent variable,243 rules were obtained.The experiments have been carried out that the developed structure of the ANFIS model is 3 15 125125 1.And there are also view rules which show the output has been made by ANFIS, the view rules for processing this data show an output prediction of 41.2 as shown in Figure 4.7

Figure 4.7. ANFIS rule viewer

After viewing the rules,there is also a view surfaceshows the comparison between two inputs and one output,responsibility and competency variables are compared to the output of job satisfaction as shown in Figure 4.8.

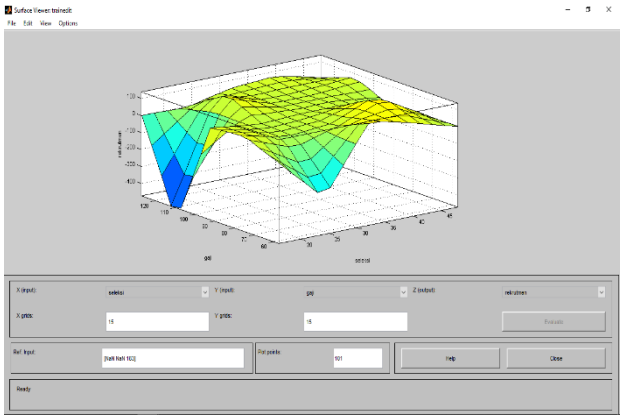

Figure 4.8. View Surface Effect of Input Parameters on Output

CONCLUSION

The conclusions can be quoted from the discussion above are:
1. Minimizing the error rate in the processing of Quality HR data
2. The decision support system is implemented using the ANFIS method
3. Produce integrated information so that the leaders can feel more satisfied with the various information needed.

Based on the shortcomings of the above discussion of the system, the author provides several suggestions including:

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1. It is hoped that in the future there will be good system development in the form of additional features.
2. Recommend that the system can provide for backing up data.

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