

10. Decision Support System for Deciding Eligible Journals to be Published in Majalah Kedokteran Nusantara Using the Fuzzy Logic Method

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Decision Support System for Deciding Eligible Journals to be Published in Majalah Kedokteran Nusantara Using the Fuzzy Logic Method

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Abstract. The decision to determine whether or not a journal to be published in Majalah Kedokteran Nusantara can be decided by using the Decision Support System with certain methods. One of methods used is fuzzy logic method and is applied to the Microsoft Visual Basic programming language. From the results of the research, the first step that must be done in determining a journal is published was to identify the problem and to determine how to evaluate the quality of the journal which is done by calculating the parameter values of the variables that have been determined by the editorial board. The parameters used in the calculation were title of articles, abstract, background, content, conclusions and bibliography. The conclusions obtained from the research is to building a decision support system to determine a journal published in Majalah Kedokteran Nusantara using fuzzy logic method was not so difficult to do, because it utilized Fis Sugeno Matlab application and by using fuzzy logic methods and utilizing



fuzzyfication to get linguistic variables were very helpful in determining how a journal is published.

1. Introduction

A journal is a periodical publication that contains material that is in great demand when published. Journal is also called scientific work, and currently the publication of scientific works is very low. The low number of publications of scientific works is very concerning. The amount of research and quality of research has received attention from the government of the Republic of Indonesia, where in this case it is expected that each lecturer must be actively involved in the research. The amount of research and quality of research has become a benchmark of the performance of universities [1]. The quality of research will determine the quality of teaching, and this has a direct impact on the level of student acceptance of teaching lecturers [2] and also efforts to improve ICT utilization [3]. Decision support systems have been widely used, including identification of male fertility [4], student with special needs [4], decision making [5], hypertensive retinopathy identification [6], and e-business[7]. There are many positive things that can be achieved from highly reputable publications, both for the writer's personal lecturers and for universities and nations. But it was also realized that producing and publishing reputable journals was not easy. There are several things that need to get serious attention, both in terms of writing articles and in their publication efforts. At this time online journal publishing has been done by journal managers, this is intended to produce good and reputable journals. One method used in making decisions in determining journals that are worth publishing is to use Fuzzy Logic [8].

Fuzzy system is a system that is built with definitions, work methods and clear descriptions based on fuzzy logic theory. Fuzzy logic is a method of "counting" with variable variables (linguistic variables). Fuzzy logic has become an amazing research area because of its ability to bridge the language of the machine that is responsive to human language that tends to be imprecise, namely only by emphasizing the meaning or significance. With fuzzy logic, the human expertise system can be easily implemented into machine language and efficient [9]. Fuzzy logic is developed by imitating human thinking that often works with the principle "roughly", this is different from Boolean logic which only recognizes two states yes / no, true / false, fuzzy logic allows modification of the situation with a level / degree certain so as to allow conditions to be true, somewhat correct, incorrect, somewhat wrong, and wrong. Although relatively new, fuzzy logic has been applied in many fields, including in 1990 when it was first made washing machines with fuzzy logic in Japan. The fuzzy system is used to determine the exact rotation automatically based on the type and amount of dirt and the amount to be washed [10].

2. Related Works

The concept of Decision Support System (Decision Support System) was first introduced in the early 1970s "Management Decision System", the concept of Decision Support System is a computer-based interactive system that helps make use of data and models to solve unstructured problems and semi-structured. DSS is designed to support all stages of decision making, starting from the stage of identifying problems, selecting relevant data, determining the approach used in the decision-making process to evaluating alternative choices [11].

3. Research Methods

3.1. Data Type and Data Collection

The types of data used in this study are as follows:

1. Primary data, namely data collection is done through interviews. Data collection with this interview was conducted to find data and information about things needed in the study. Interviews are conducted with the division head who is used as the object of research. The interviews conducted prioritize how the process of determining the journal's publication is like.
2. Secondary data is to obtain data, descriptions and more complete information the author uses a literature study by collecting and studying literature related to decision support systems theory and fuzzy

logic methods. Literary sources in the form of books, papers, journals, scientific works and other supporting sites.

3.2. System Analysis

The working principle for determining the quality of a published journal is as follows:

1. Analyze with fuzzy methods to determine how a journal is published.
2. Designing a decision support system to determine which journals are eligible to be published.
3. Implement a decision support system to determine like a journal is published

For software (software) needed in analyzing and designing the system in this study are:

1. Microsoft Windows 7 operating system.
2. MySQL,
3. MATLAB
4. Visual Basic programming

4. Results and Discussions

From the results, the first step that must be done in determining a journal is published is to identify the problem and determine how to evaluate the quality of the journal, calculating the parameter values of the variables that have been determined by the editorial board. If the results of the parameter calculation were completed, the editorial staff can evaluate the quality of a published journal. The fuzzy logic method of determining a journal like will ease the peer-review in determining which journal is eligible to be published in MKN (Majalah Kedokteran Nusantara).

Data analyzed using Matlab R2008b, a calculation and analysis programming software that is widely used in the area of application of mathematics both in the field of education and research at universities and industries. With Matlab, complex mathematical calculations can be implemented in the program more easily. A very useful aspect of Matlab is that there are facilities for fuzzy logic toolboxes that are useful in making systems based on fuzzy logic that contain rules based on user desires. Starting the fuzzy logic toolbox on matlab can be done by typing fuzzy in the command window. Next, it will appear the Sugeno type FIS editor window, starting by adding and organizing inputs and outputs, while starting FIS with Sugeno began by creating a new FIS sugeno, as shown in Figure 1.

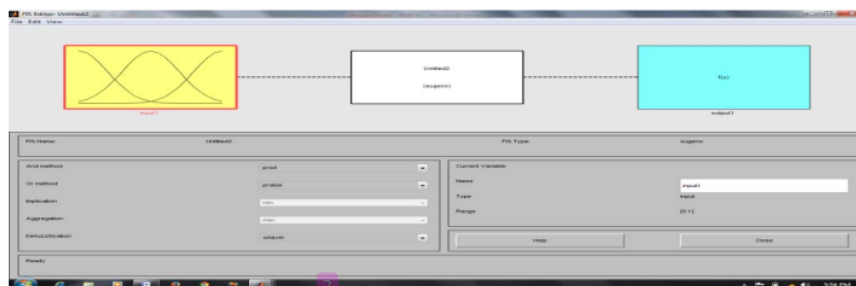


Figure 1. FIS Editor

The next step was to add the desired number of parameters such as the title of the script, abstract and keywords, background, contents of the paper, conclusions, and bibliography. Each input parameter has a certain value, each function (MF) had different type. For category I, it use type zmf, category II used type zmf, category III used type zmf, category IV used type zmf, category V used type zmf and category VI uses type zmf. The output variable in the form of results has two MF categories, namely Accepted, Accepted with improvements. If it Rejected, the three categories used trimf type, Users of six input variables with each variable having three MF, then made as many as 25 rules with the following algorithm:

1. If (Title is Yes) and (Abstract is Yes) and (Background is Yes) and (Content is Yes) and (Conclusion is Yes) and (List of Library is Yes) then (Output1 is Accepted)
2. If (Title is Yes) and (Abstract is No) and (Background is Yes) and (Content is Yes) and (Conclusion is Yes) and (List of Library is Yes) then (Output1 is Accepted_With_Revision)
3. If (Title is Yes) and (Abstract is Unconvincing) and (Background is Unconvincing) and (Contents is Unconvincing) and (Conclusion is Yes) and (References is Not) then (Output1 is Rejected)
4. If (Title is Unconvincing) and (Abstract is Yes) and (Background is Unconvincing) and Content is Yes) and (Conclusion is cannot be assessed) and (List of Library is Yes) then (Output1 is Rejected)
5. If (Title is unconvincing) and (Abstract is unconvincing) and (Background is Yes) and (Content is Yes) and (Conclusion is unconvincing) and (References is Yes) then (Output1 is Accepted_With_Revision)
6. If (Title is unconvincing) and (Abstract is cannot be assessed) and (Background_Back is cannot be assessed) and (Content is cannot be assessed) and (Conclusion is cannot be assessed) and (References is cannot be assessed) then (Output1 is Rejected)
7. If (Title is Yes) and (Abstract Is Yes) and (Background Is Yes) and (Content Is No) and (Conclusion Is No) and (Bibliography Is Yes) Then (output is Accepted with Improvement)
8. If (Title is Yes) and (Abstract Is No) and (Background Is No) and (Content Is unconvincing) and (Conclusion Is No) and (Bibliography Is Yes) Then (output is Accepted with Improvement)
9. If (Title is No) and (Abstract Is unconvincing) and (Background Is unconvincing) and (Content Is cannot be assessed) and (Conclusion Is unconvincing) and (Bibliography Is No) Then (output is Rejected)
10. If (Title is No) and (Abstract is cannot be assessed) and (Background is cannot be assessed) and (Content is unconvincing) and (Conclusion is cannot be assessed) and (References is cannot be assessed) then (Output1 is Rejected)
11. If (Title is Yes) and (Abstract is unconvincing) and (Background is Yes) and (Content is Yes) and (Conclusion is Yes) and (References is Yes) then (Output1 is Accepted)
12. If (Title is Yes) and (Abstract is cannot be assessed) and (Background is Yes) and (Content is Yes) and (Conclusion is Yes) and (References is Yes) then (Output1 is Accepted_With_Revision)
13. If (Title is Yes) and (Abstract is Yes) and (Background is No) and (Contents is Yes) and (Conclusion is Yes) and (References is Yes) then (Output1 is Accepted_With_Revision)
14. If (Title is Yes) and (Abstract is Yes) and (Background is No) and (Content is No) and (Conclusion is Yes) and (References is Yes) then (Output1 is Accepted_With_Revision)
15. If (Title is Yes) and (Abstract is Yes) and (Background_Back is No) and (Content is No) and (Conclusion is No) and (References is Yes) then (Output1 is Accepted_With_Revision)
16. If (Title is cannot be assessed) and (Abstract is No) and (Background is No) and (Content is No) and (Conclusion is No) and (List of Library is No) then (Output1 is Rejected)
17. If (Title is cannot be assessed) and (Abstract is cannot assessed) and (Background_is cannot be assessed) and (Content is cannot be assessed) and (Conclusion is cannot be assessed) and (References is cannot be assessed) then (Output1 is Rejected)

All algorithms are created in the Rule Editor by using operation to determining the results value. The algorithm created in the rule editor can be visualized using the Rule Viewer by changing the parameter values to get the output value. The algorithm results made in the rule editor can be displayed in graphical form using a surface viewer, as shown in Figure 2.

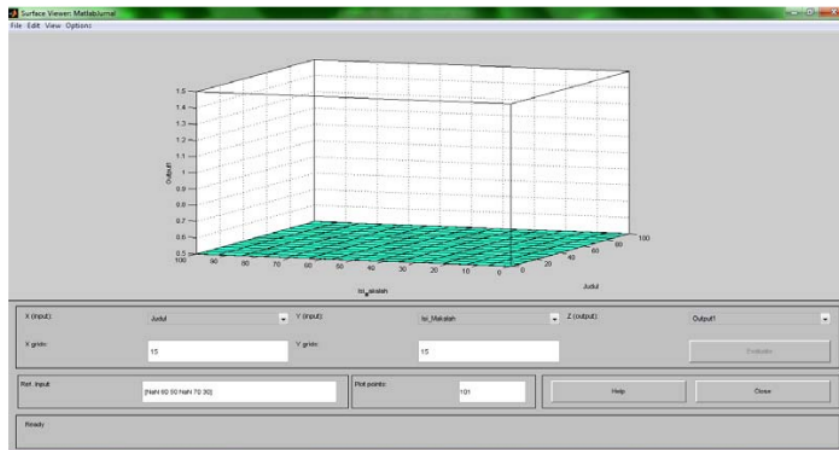


Figure 2. Sugeno Surface Viewer

The conclusions from the results of data input:

No	Article Title	Abstract	Background	Content	Conclusions	References	Output
1	Title 90	Abstract 60	Background 80	Content 70	Conclusions 50	References 60	value 100 (Accepted)
2	Title 96.32	Abstract 33.44	Background 82.81	Content 92.19	Conclusions 69.64	References 60	Value 50 (Accepted with revision)
3	Title 100	Abstract 21.56	Background 36.98	Content 38.02	Conclusions 63.8	References 32.81	Value 0 (Rejected)
4	Title 34.21	Abstract 55.31	Background 39.06	Content 83.85	Conclusions 11.3	References 47.19	Value 0 (Rejected)
5	Title 38.42	Abstract 22.19	Background 95.31	Content 90.1	Conclusions 24.43	References 53.44	Value 50 (Accepted with Revision)
6	Title 46.84	Abstract 11.56	Background 19.27	Content 24.48	Conclusions 14.22	References 12.81	Value 0 (Rejected)
7	Title 81.58	Abstract 44.06	Background 68.23	Content 54.69	Conclusions 32.45	References 37.19	Value 50 (Accepted with

							Revision)
8	Title 78.42	Abstract 35.31	Background 54.69	Content 43.23	Conclusions 36.09	References 43.44	Value 50 (Accepted with Revision)
9	Title 59.47	Abstract 25.94	Background 44.27	Content 13.02	Conclusions 22.24	References 30.94	Value 0 (Rejected)
10	Title 56.32	Abstract 11.56	Background 18.23	Content 26.56	Conclusions 11.3	References 13.44	Value 0 (Rejected)
11	Title 75.26	Abstract 22.81	Background 74.48	Content 69.27	Conclusions 47.03	References 42.81	Value 100 (Accepted)
12	Title 81.58	Abstract 10.31	Background 79.69	Content 75.52	Conclusions 49.22	References 43.44	Value 35.1 (Accepted with Revision)
13	Title 81.58	Abstract 45.31	Background 52.6	Content 75.52	Conclusions 49.22	References 43.44	Value 50 (Accepted with Revision)
14	Title 77.37	Abstract 49.06	Background 55.73	Content 65.1	Conclusions 52.14	References 43.44	Value 50 (Accepted with Revision)
15	Title 74.21	Abstract 52.81	Background 58.85	Content 47.4	Conclusions 30.99	References 44.06	Value 50 (Accepted with Revision)

5. Conclusions

By conducting research related to support systems for deciding to determine the quality of a journal that is worth publishing in MKN (Majalah Kedokteran Nusantara) with fuzzy logic method can be concluded that:

1. Building a decision support system to determine a journal published in Majalah Kedokteran Nusantara using fuzzy logic method was not so difficult, by utilizing Matlab Fis Sugeno application.
2. By using fuzzy logic methods and utilizing fuzzyfication to obtain linguistic variables, it was very helpful in determining how a journal is published.
3. In developing a decision support system to determine a journal published in Majalah Kedokteran Nusantara, following the rules applied (inference) to the fuzzy logic method so that it can produce quality information.
4. With the application of a support system for deciding to determine which journals are eligible to be published, it revealed that the article with title 'Penyakit Pencernaan' with the title value 100, abstract 60, background 80, content 70, conclusion 70, and bibliography 60 was fulfilled the requirements.

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