Application of the Naive Bayes Classifier Method and Fuzzy Analytical Hierarchy Process in Determining Books Eligible for Publishing

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Abstract

Abstract The manuscript selection process is the process of assessing manuscripts worthy of publication. The Editor's job is to provide an evaluation of each manuscript based on the assessment criteria and sub-criteria. By using a decision support system, it can make it easier for policymakers to determine the suitability of a manuscript. In this research, a decision support system is applied to select papers that are worthy of publication, namely the Fuzzy Analytical Hierarchy Process (F-AHP) method for selecting the suitability of manuscripts using subjective criteria and the Naïve Bayes method for classifying books based on their genre. The test results using the F-AHP method produced an accuracy rate of 83.33% using 30 books out of 150 books and using the Naïve Bayes method produced an accuracy rate of 80% using 30 books from the internet. This system uses the Visual Studi Code IDE, Firebase, and Pythonanywhere as its database with an Android display.

Keywords: *Fuzzy-AHP method; Naïve Bayes method; Decision Support System; Script selection; Books Worth Publishing*

1. Introduction

Publishing is a creative business activity related to writing content in books, journals, magazines, newspapers, to other digital content such as news agency activities [1]. The quality of publishing products has two things that must be considered, namely the printability of a product [2] and the suitability of publication [3]. Printability is a factor that must be considered, such as ink, paper, and so on. A day, the company can produce 40 to 50 book titles when it reaches the binding stage, but when it comes to printing it reaches approximately 20 book titles. This is because nowadays electronic book products are more popular. Apart from printing suitability, the publication suitability of a product must also be considered, because if a product has been printed but when it goes through the publication suitability process the product cannot be published due to several reasons, then the relevant agency or the author feels disadvantaged. The publication

eligibility process is carried out by reviewers to assess and declare whether they are suitable for publication or not, then processed again and forwarded to the editor. During the publication eligibility process, several problems emerged, such as the efficiency and effectiveness of managing the administrative assessment of manuscripts by reviewers. Problems in the process of determining the weight and evaluation of manuscripts by reviewers arise from several obstacles related to the subjectivity of assessing the weight of criteria and sub-criteria, the ambiguity of the manuscript evaluation process, the speed and accuracy of aggregation between the weight of the results and evaluation criteria to obtain manuscript priority [4]., To overcome this, one of the alternatives proposed in this research is to weigh criteria and evaluate manuscripts using a computer with a Decision Support System (DSS). Systems can be used to assist decision-making in semi-structured situations and unstructured situations, where no one knows for sure how the decision should be made [5]. The use of SPK allows the issuance eligibility process to be easier and more systemized by using applications such as Android.

In decision support systems, there are two decision-making methods to determine the best alternative from several alternatives based on certain criteria, namely: Multi Attribute Decision Making (MADM) [6] and Multi Objective Decision Making (MODM) [7]. MADM is usually used to solve problems in discrete space to select the best alternative, while MODM is used to solve problems in continuous space to determine the best alternative. Some of the methods included in MADM are the simple Additive Weighting Method (SAW), Weighted Product (WP), ELECTRE, Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and Analytic Hierarchy Process (AHP). Meanwhile, the methods included in MODM are Collective Utility (CU). Because the feasibility of publishing a manuscript has many criteria, it is included in the MADM category and the method that is widely used is AHP. The AHP method is used as a problem-solving method compared to other methods because it has several advantages, including The criteria chosen, down to the deepest sub-criteria, taking into account validity up to the tolerance limit for inconsistencies in the various criteria and alternatives chosen by the decision maker, as well as taking into account durability of decision making sensitivity analysis output [8]. However, the AHP method has a weakness, namely the model's dependence on input in the form of an expert's perception. Expert subjectivity determines the final value. The AHP method has been refined by combining it with Fuzzy logic, so it is called the Fuzzy Analytical Hierarchy Process (F-AHP). F-AHP is useful for covering the weaknesses of the AHP method, namely problems with criteria that have a more subjective nature [9]. To classify books based on genre, you can use the Naïve Bayes Classifier (NBC) method, which is a classification method based on Bayes' theorem. This method is known to be better than several other classification methods. First, the main characteristic of Naïve Bayes is the very strong assumption of independence from each condition or event. Second, the model is simple and easy to make. Third, the model can be implemented for large data sets [10]. This NBC method also has the advantage of a high level of accuracy as well as faster computing time so this NBC method is widely used for mining processes [11].

In this research, the fuzzy AHP and NBC methods are combined to predict the genre of a book in determining whether a book is suitable or not suitable for publication, making it easier for agencies in the publication feasibility process and providing suggestions in making decisions. The Decision Support System (F-AHP and NBC) is implemented on the Android system using the Visual Studi Code IDE, Firebase, and PythonAnywhere as the database.

This research uses the System Development Life Cycle (SDLC) method. This method consists of 6 stages, namely planning (object determination, literature study, data collection), system requirements analysis, system design, system implementation, and system testing [12], [13].
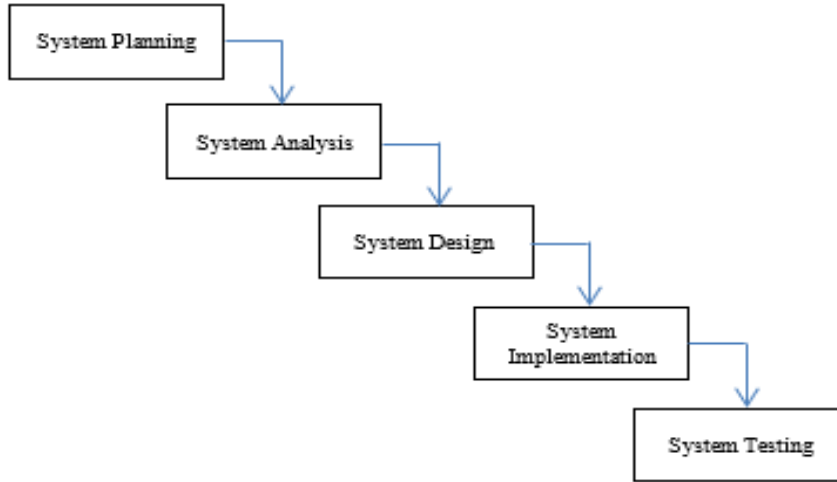
Figure 1. System Development Life Cycle

The object determination stage is the initial stage for determining what objects will be used as research material. The research object used in this research is the feasibility of publishing a book where this source was obtained from one of the branches of the printing and publishing company, namely PT. Gramedia Cikarang Printing.

The next stage is literature study which is the process of searching, reading, and understanding information regarding the implementation of this research. Literature studies were carried out from various fields of science that were used related to publication suitability, namely the F-AHP and NBC methods.

There are several steps in using the F-AHP method, namely as follows [14].

1. Create a hierarchical structure of the problem you want to solve and then make pairwise matrix comparisons between each criterion using the Triangular Fuzzy Number (TFN) scale.

2. Determine the fuzzy synthesis value (S_i) to obtain relative weights for each element of decision-making using the equation

$$Si = \sum_{j=1}^{m} M_{j}^{i} \times \frac{1}{\sum_{i=1}^{n} \sum_{j=1}^{m} M_{i}^{j}} \tag{1}$$

3. Calculate the degree of membership from the previously obtained fuzzy synthesis comparison to get the vector value (ν) using the equation :

$$V(M_1 \geq M_2) = \begin{cases} 1 & \text{jika } m_1 \geq m_2 \\ 0 & \text{jika } l_2 \geq u_1 \\ \frac{l_2 - u_1}{(m_1 - u_1) - (m_2 - u_2)} & \text{selainnya} \end{cases} \tag{2}$$

4. Calculate the vector weight value with the equation :

$$W' = (d'(A_1), d'(A_2), d'(A_3), \dots d'(A_N))^T \tag{3}$$

5. Normalize the vector weights that have been obtained using the equation:

$$W = (d(A_1), d(A_2), d(A_3), \dots d(A_N))^T \tag{4}$$

6. Vector weight ranking, namely the total ranking obtained by multiplying the evaluation vector by the priority vector.

7. Decision-making by selecting the highest total ranking

For the NBC method, classification is based on Bayes' theorem with the main characteristic assuming very strong independence of each condition or event. The formulation of Bayes' theorem is by equation (5)

$$P(C \mid X) = \frac{P(X \mid C) \times P(C)}{P(X)} \tag{5}$$

Where X is a class, C is an attribute, $P(C \mid X)$ is the probability of a hypothesis based on the condition probability of X, $P(X \mid C)$ is the probability of the hypothesis based on condition C, P(C) is the probability of C, and P(X) is the probability of X. In the classification process, some guidance is needed to determine the appropriate class for the sample being analyzed. Therefore, Bayes' theorem has been adapted in the following way:

$$P(C \mid F_1, \ldots, F_N) = \frac{P(F_1, \ldots, F_N \mid C) \times P(C)}{P(F_1, \ldots, F_N)} \tag{6}$$

In equation (6), variable C describes the class, while variables $F_1, \ldots, and\, F_N$ describe the characteristics or instructions needed to carry out classification. Therefore, the formula explains that the possibility of entering a sample that has certain characteristics into class C (posterior) is the product of the possibility of class C appearing (before the sample enters, usually called prior), and the possibility of the appearance of the sample characteristics in class C (also known as likelihood), then divided by the probability of the appearance of sample characteristics in general (also known as evidence). Thus, the formula works simplified as follows:

$$P_{osterior} = \frac{Prior \times likehood}{ecidence} \tag{7}$$

The evidence value is always constant for each class in one sample. Then, The posterior value will be compared with the posterior values of other classes to determine which class will be used to classify the sample. When carrying out classification, using the naïve Bayes method, it will produce category labels that have the highest probability, namely called Vmap with input in the form of attributes $a_1, a_2, \ldots . a_n$, and so on, where a_1 is the first word. Then, in text classification, the maximum value of the text category is looked for. The Vmap formula is as follows:

$$V_{map} = argmax_{xj \epsilon v} P(x_j \mid a_1, a_2, \ldots, a_n) \tag{8}$$

The next stage is data collection. In this research, research data was collected at one of the printing and publishing agencies, namely Gramedia Cikarang Printing, which is located at Jl. Angsana Raya Block A2 No. 1 Delta Silicon Industrial Park Sukaresmi, Sukaresmi, Cikarang Sel., Bekasi Regency, West Java. There are 2 types of data collection for this research, namely secondary data and primary data. Secondary data in this research is data obtained through literature, previous studies, journals, and others. Primary data in this research is data obtained directly from research respondents, namely a resource person or employee who works in the relevant agency. The data needed in the research is shown in Table 1.

Table 1. Research Data Needs

Data Requirements	Data Source	Methods	Data Usability
Criteria data in determining whether a book is worthy of publication or not	Resource person	Interview	Basic knowledge for determining criteria in assessing eligibility
Weight data for each criterion for assessing the suitability of book publication	Resource person	Interview	Determine the weight of each criterion
Dataset of books for training data	Resource person	Interview	Carrying out training data for the method used
Dataset of books for data testing	Internet	Interview	Used to carry out data testing on the NBC classification method

There are 6 criteria for published eligibility criteria data used. Before using criteria data obtained from the agency, the CR (Consistency Ratio) value is required to be no more than 0.1 using the AHP calculation so that the data is declared valid and can be continued to the F-AHP calculation.

1.1.   System Analysis

The requirements analysis stage is analyzing the requirements needed to create a system. Several needs will be used in developing this expert system, namely: hardware, software, and data needs. Hardware requirements include a PC with a minimum of 4GB RAM, 500GB internal memory, minimum integrated VGA graphics card, and minimum Intel Gen 3 or AMD A3 processor or below. Software requirements include a minimum Windows 10 64-bit Operation System, Android Studio, IDE / Visual Studio Code, and browser. The data includes data on the criteria for the suitability of a book, data on the weight values of each criterion for each alternative book, a dataset of books for training data, and a dataset of books for testing data.

Before entering the FAHP method, the system will carry out text classification using the Naïve Bayes method, namely inputting the book title provided by the user when filling in the alternative form. Entering the data pre-processing stage, this initial stage aims to prepare the text into data that will undergo processing at the next stage. This pre-processing text has several stages, namely case folding and tokenizing. The case folding stage is the stage for changing all the letters in the text to lower case or lower case. Enter the tokenizing stage, which is the process of sorting the contents of the text so that the text becomes units of words. After the pre-processing stage is complete, it enters the transformation stage. This stage has steps, including reducing the number of words by eliminating irrelevant words (stopwords) and changing these words to their basic form (stemming). The transformation stage also has 2 stages, namely filtering and stemming. Filtering is the stage of taking important words from the tokenized results, while the steaming process is the process of making words return to their basic form. After completing pre-processing and transformation, the results of these processes continued to be used in the Naïve Bayes Classifier (NBC) method for predicting book genres. After successfully predicting the genre of the previous book, enter FAHP initial processing, namely data processing which is carried out in the form of determining the criteria obtained from the company whether the consistency ratio value is less than 0.1 or not using the Analytic Hierarchy Process (AHP) method. If the consistency ratio value is less than 0.1 then you can proceed to the FAHP method but if not, then the comparison value between the criteria is declared inconsistent.

1.2.   System Design

The system design model explains how the system works in a structured manner. In a basic model of a system, there are 3 main processes, namely input, process, and output. The system workflow design can be seen in Fig. 3
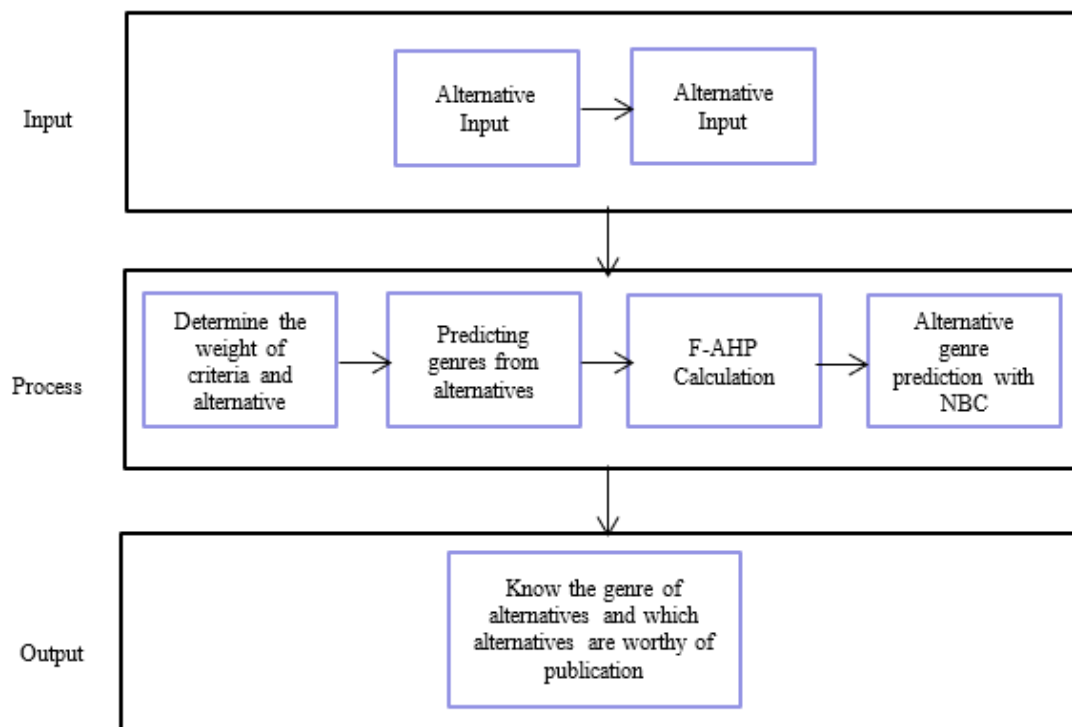

Figure 2. System Design Model

In Figure 2, there are input, process, and output stages with explanations, namely:

- Input is input provided by system users. Input to the system that will be created is in the form of filling in an alternative form that will be given to system users and users can answer questions and fill in the form

- The process is the stage where the name of the given alternative will be classified by the Naïve Bayes method, and the genre of the alternative can be predicted. The weights obtained from fuzzy are then continued with the weight values into the fuzzy AHP method and through the Naïve Bayes Classifier (NBC) classification, the genre of the alternative can also be predicted

- Output is the result obtained from the process that has been carried out and the results obtained are the suitability of a book and the predicted book genre.
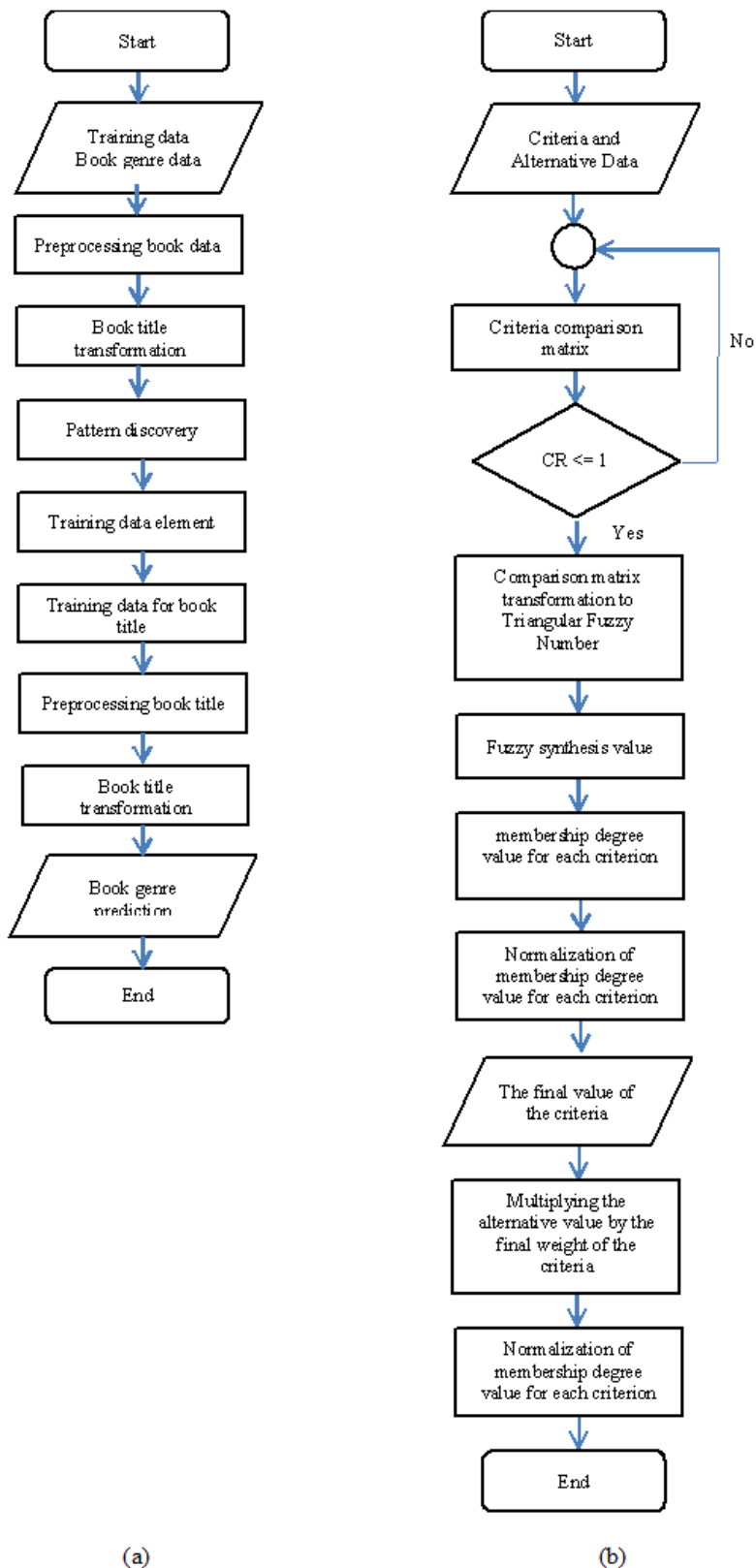
Figure 3. Flowchart of a Decision Support System: (a) NBC dan (b) F-AHP

A flowchart of the text classification process using the Naïve Bayes Classifier (NBC) is used to present the workflow or text classification process using NBC to obtain a prediction of the input book genre. This flowchart is in the form of a flow diagram consisting of predetermined symbols. The flowchart for text classification using the NBC method is shown on Appendix page 17. First, we have a dataset containing book titles and book genres, where the dataset is used as training data for classifying texts using the NBC method. The preprocessing process is carried out first and then continues with the transformation process. Continue with pattern discovery with NBC to look for word frequency, genre, and others. Then training data elements/models are produced using the NBC method. Training data in the form of book titles is input to predict the genre of the book by carrying out the text preprocessing process and also the text transformation process. After obtaining each word from the input book title, we proceed to the process of predicting the book genre using NBC and the NBC elements/models that have been obtained previously. The final result was obtained in the form of book genre predictions using the NBC text classification method.

The flowchart of the F-AHP decision support system is used to present the workflow or process that the F-AHP method can carry out to get the output as shown in the picture. It starts by making a comparison between criteria and evaluating alternatives to the criteria. Followed by creating a criteria comparison matrix using the AHP method first. After using the AHP method, the consistency ratio value is obtained. If the value is less than 0.1 then the F-AHP calculation can be continued, but if it does not meet the requirements, then the criteria can be reassessed. The criteria comparison matrix is transformed into a Triangular Fuzzy Number (TFN) and the fuzzy synthesis value is searched for. After obtaining this value, we proceed to find the membership degree value for each criterion and after obtaining this value, it is normalized to obtain the final weight value for each criterion. The value that you have at the beginning is the alternative value for the criteria. If you multiply it by the final weight of the criteria, you will get the value for the book's suitability for publication.

1.3.   System Implementation

The system implementation in the decision support system application for the feasibility of publishing this book uses the Dart programming language with Flutter as the framework and Visual Studio Code as the Integrated Development Environment (IDE). One of the source codes for this application is shown on Appendix page 27.
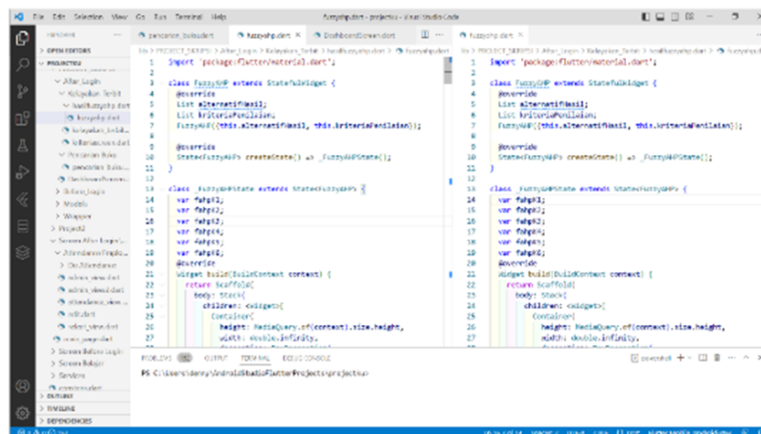

Figure 4. Source Code Application

1.4.   System Testing

After applying the Fuzzy Analytical Hierarchy Process (FAHP) method to this decision support system, it is then necessary to test the system, namely functional testing, functional testing, and validation testing. Functional testing is a test to see whether the system functionality is running as expected and validation testing is to test the accuracy of the system to compare the decision results with the results provided by the system.

For validation tests, accuracy, precision, and recall values are calculated. Accuracy is how close the predicted value is to the actual value. Precision indicates the level of accuracy in classification. Meanwhile, recall functions measure how many positive results can be identified correctly. Measuring accuracy, precision, and recall can use the confusion matrix. Confusion matrix is a measuring tool in the form of a matrix that is often used by researchers to obtain the accuracy of the classification system created for classes with the algorithm/method used when creating the system [15].

$$A = \frac{TP + TN}{TP + TN + FP + FN} \times 100 \tag{9}$$

$$P = \frac{TP}{TP + FP} \times 100 \tag{10}$$

$$R = \frac{TP}{TP + FN} \times 100 \tag{11}$$

2.   Result and Discussion

The process of determining the feasibility of publishing a book using the Dart programming language, the framework using Flutter, and the Naïve Bayes Classifier (NBC) classification for Android-based book genre predictions produces output in the form of book genre predictions, table data, descriptions of publication eligibility and also book descriptions that have been published. The system display for book eligibility is shown in Figure 5

Figure 5. System Display for Book Eligibility

2.1.   Book Classification on Testing Data

Determining the genre of a book in testing data aims to determine the genre of the book entered without providing information about the genre of the book so that the system can make predictions

about the genre of the book. It can be seen that the training data used in this research comes from sources and for testing data for book genre prediction classification, 30 books from the internet are used, to ensure that the system obtains true accuracy because if you use testing data from the dataset, it is very likely that all the results will be correct. Testing classification results can be seen in the following table 2.

Table 2. Results of Classification Testing Data on Genre Prediction

No	Book Title	Genre	Classification Results
1	Panduan Adobe Ilustrator	Multimedia	Multimedia
2	Kupas Tuntas Adobe Photoshop	Multimedia	Multimedia
3	Kupas Tuntas Microsoft Windows 10	Sis. Operasi	Sis. Operasi
4	Membuat Database pada SQL Server 2000 dengan VB 6	Database	Database
5	Belajar Singkat Pemrograman C	Pemrograman	Pemrograman
6	Pemrgraman Java menggunakan IDE Callisto	Pemrograman	Database
7	Membuat Sistem Informasi Kursus Berbasis Web	Pemrograman	Sis. Operasi
8	Buku Sakti Wireless Hacking	Jaringan	Jaringan
9	Panduan Lengkap Linux Dekstop dengan Red Hat Linux 9	Sis. Operasi	Multimedia
10	Basis Data Terapan	Database	Database
11	Konsep dan Perancangan Database	Database	Database
12	Basis Data Dasar	Database	Multimedia
13	Mengatasi Masalah Komputer dengan Registry	Sis. Operasi	Sis. Operasi
14	Majemen Basis Data dengan MySQL	Database	Database
15	Belajar Kilat Adobe Photoshop	Multimedia	Multimedia
16	Mengenal Sistem Operasi Windows 8	Multimedia	Multimedia
17	Corel Draw dan Adobe Ilustrator	Multimedia	Multimedia
18	Teknik Seleksi dan Blending Adobe Photoshop	Sis. Operasi	Sis. Operasi
19	Teknik Hacking Android	Sis. Operasi	Sis. Operasi
20	Tips dan Trik Jaringan Wireless	Jaringan	Jaringan
21	Membuat Jaringan Komputer di Windows dan Linux	Jaringan	Jaringan
22	Jaringan di windows 7, 8, dan 8.1	Jaringan	Jaringan
23	Kitab Registry dan Optimalisasi MS. Windows	Sis. Operasi	Sis. Operasi
24	Hacking Bersenjatakan Flashdisk	Jaringan	Multimedia
25	Kumpulan Latihan SQL	Database	Database
26	Pengenalan PHP dan Jawa untuk Pemula	Pemrograman	Pemrograman
27	Mengonfirmasi Jaringan dan Internet di W. Vista	Jaringan	Jaringan
28	Kumpulan Aplikasi Java	Pemrograman	Database
29	60 Teknik Optimasi Jaringan Komputer	Jaringan	Jaringan
30	Jaringan Komputer Pendekatan Praktis	Jaringan	Jaringan

There are 30 testing data and 24 of the 30 data are correct in the classification process. Books that are not appropriate in the genre prediction classification process include "Membuat Sistem Informasi Kursus berbasis Web", "Pemrograman Java menggunakan IDE Eclipse Callisto dalam Penerapannya pada Pengembangan Aplikasi Java dengan Konsep Enterprise Java Bean dan Web

Service", "Panduan Lengkap Linux Desktop dengan Red Hat Linux 9.0", "Basis Data Dasar", "Hacking Bersenjatakan Flash Disk", dan juga "Kumpulan Aplikasi Java". This is possibly because there are words that are not in the model so the value is low and also because the training data used contains 150 books.

2.2.   Determination of Eligibility for Publication

Assessment between testing/alternative data against assessment criteria based on information provided by respondents, namely with an assessment between a scale of 1-10 and then converted to a smaller number so that The output value is not too large, divided by 10 so that the value becomes 0.1, 0.2, etc. Alternatives/books that have been input then enter the confirmation stage to ensure whether the criteria data and alternative input provided are in accordance with those provided. The criteria list contains the weights for each criterion and for the alternative list, it is shown that there is a book code, book title, and book name. The book "Aplikasi Database Menggunakan VB 6.0 untuk Tugas Akhir dan Skripsi" has a book code of BK1 and during this publication eligibility process, the subject/genre of the book is not yet known.

The ranking stage where books that have previously been confirmed will look at their values that have been given in the alternative stage and convert them to divide by 10 so that the value is not too large. BK1 value is 0.8 for K1, 0.7 for K2, 0.7 for K3, 0.6 for K4, 0.8 for K5, and 0.7 for K6. After the submit button is pressed, the data will be entered into the Firestore Database and will be directed to the Fuzzy AHP page which displays the results of multiplying the previous assessment with the criteria weight values as in BK1 for the final value against K1 of 0.15626, K2 of 0.17726, K3 is 0.0882, K4 is 0.12657, K5 is 0.10535, and K6 is 0.05792.

Determining whether a book is suitable for publication or not aims to find out the results of the assessment given whether the book is suitable for publication or not based on existing criteria and the weights of each criterion. After previously obtaining the criteria weights, these weights are multiplied by the respondent's assessment of the books and multiplied by the weights obtained from the FAHP method. After being eligible for publication, on the previous page, it will be filtered, if it is declared unfit for publication, then the book will not be included in the database. Go to the Book Search page where there is a list of books that have gone through the publication eligibility process which is shown in Table 1. The final weight of books that are eligible for publication can be seen in Appendix 49, the value is 0.711607, which is based on the information provided by the respondent that the book This is enough to be said to be worthy of publication if it gets a score of 7. The system converts the score of 7 into 0.7 so that the score is not too big and BK1 or the book "Database Applications using VB 6.0 for Final Projects and Theses" gets a score of 0.711607 which is more is equal to 0.7, then the book is suitable for publication. Books that are not suitable for publication will not be forwarded to book genre predictions

Table 3. Alternative Final Value

Book Title	K1	K2	K3	K4	K5	K6	Total	Info
Aplikasi Database Menggunakan VB 6.0 untuk Tugas Akhir dan Skripsi	0.15626	0.17726	0.08824	0.12657	0.10535	0.05793	0.17161	Feasible
Belajar Sendiri Pengolahan Data dengan Microsoft Office 2003	0.13673	0.15194	0.08824	0.14766	0.11852	0.05793	0.70101	Feasible
Mari Menjadi Raja dari Smartphone Programmer	0.15626	0.17726	0.08824	0.14766	0.10535	0.05793	0.73270	Feasible
Buku Ajar Embeded	0.13673	0.15194	0.10084	0.14766	0.09218	0.05793	0.68728	Not feasible

2.3.   Validation Testing

This validation trial was carried out to calculate the accuracy of the testing data obtained from respondents to see whether the respondents' decisions matched the decisions of the decision support system. There are 3 validation testing options in the Fuzzy AHP decision support system, namely 10 books out of 150 books, 20 books out of 150 books, and 30 books out of 150 books. Accuracy calculations use the following formulation:

$$A = \frac{N_L}{N} \times 100 \tag{12}$$

where N_L is the number of books that match the manual calculation and N is the number of book samples taken in the calculation. From the calculations, an accuracy value of 70% was obtained for 10 books out of 150 books, 80% for 20 books out of 150 books, and 83.33% for 30 books out of 150 books.

Next, the accuracy, precision, and recall of the book genre classification were calculated using the Naïve Bayes Classifier (NBC) with a confusion matrix according to equations (9), (10), and (11). Confusion matrix is a measuring tool in the form of a matrix that is used to obtain the amount of accuracy of the classification system created for classes with the algorithm/method used when creating the system. The TP and TN values are the level of accuracy of the classification process. The higher the TP and TN values, the better the classification level of accuracy, precision, and recall. The predicted output is true and the actual value is false so it can be called a false positive (FP). The predicted output label is false and the actual value is true, so it can be called a false negative (FN). Based on calculations, the values obtained are A=80%, P=83.33%, and R=71.4%

3.   Conclusion

The results provided by the system show that of the books that became testing data, 25 books were declared fit for publication, and 5 books were declared unfit for publication. One example of a book worthy of publication as assessed by the system and worthy of publication as assessed by the resource person is "Database Application Using VB 6.0 for Final Assignments and Theses" with a final book weight value of 0.711607 (greater than 0.7). One of the books that were declared unfit for publication as assessed by the system but deemed worthy by the resource person was "Embedded Textbook" with the final weight value of the book being 0.687282 (less than 0.7), so it was declared unfit for publication. However, if calculated using the manual assessment, the average obtained is 7 so the manual calculation is said to be worthy of publication. The results of testing the decision support system for the feasibility of publishing a book produced a high accuracy value of 83.33% with the use of 30 books out of 150 books. The use of the genre prediction classification method using the Naïve Bayes Classifier (NBC) is also good and obtained an accuracy rate of 80% using 30 testing data originating from the internet and it was found that 24 books were predicted correctly and 6 books were predicted incorrectly

4.   Acknowledgement

References

[1] K. Anwar, A. R. Anti, "Pengelolaan dan Pengembangan Bisnis Percetakan pada Rumah Grafika Pekalongan dalam Perspektif Etika Bisnis Islam," Manis: Jurnal Manajemen dan Bisnis, vol. 6, no. 2, pp. 81-90, 2023. [Online]. Available: https://doi.org/10.30598/manis.6.2.81-90

[2] L. Olivianita, Ekojono, and R. Ariyanto, "Sistem Pendukung Keputusan Kelayakan Hasil Cetakan Buku Menggunakan Metode MOORA," Semin. Inform. Apl., no. 9, pp. 1–6, 2016. [Online]. Available: http://jurnalti.polinema.ac.id/index.php/SIAP/article/view/30

[3] M. Ulum, "Sistem Pendukung Keputusan Penyetujuan Penerbitan Buku Dengan Metode Analytical Hierarchy Process (Studi Kasus : Pt. Galangpress Media Utama Baciro Yogyakarta)," Skripsi, Dept. Teknik Informatika, UIN Sunan Kalijaga, Yogyakarta, 2012. [Online]. Available: http://digilib.uin-suka.ac.id/id/eprint/10889/

[4] Ekastini, Kusrini, E. T. Luthfi, "Penerapan Metode Fuzzy Analytical Hierarchy Process untuk SPK Penyeleksian Naskah Layak Terbit," Citec Journal, vol. 4, No. 2, pp. 117-127, 2017. [Online]. Available: https://doi.org/10.24076/citec.2017v4i2.103

[5] N. Sutrikanti, H. Situmorang, Fachrurrazi, H. Nurdiyanto, and M. Mesran, "Implementasi Pendukung Keputusan Dalam Pemilihan Calon Peserta Cerdas Cermat Tingkat SMA Menerapkan Metode VIKOR," J. Ris. Komput. (JURIKOM), vol. 5, no. 2407, pp. 109–113, 2018. [Online]. Available: http://dx.doi.org/10.30865/jurikom.v5i2.612

[6] Y. Qin, Q. Qi, P. Shi, S. Lou, P. J. Scott, X. Jiang, "Multi-Attribute Decision-Making Methods in Additive Manufacturing: The State of the Art," Processes, vol. 11, No. 2, pp. 1-27, 2023. [Online]. Available: https://doi.org/10.3390/pr11020497

[7] C. L. Hwang, Y. J. Lai, T. Y. Liu, "A New Approach for Multiple Objective Decision Making," Computers & Operations Research, vol. 2o, no. 8, pp. 889-899. [Online]. Available: https://doi.org/10.1016/0305-0548(93)90109-V

[8] S. Ipnuwati, K. Khotimah, K. P. Sari, "Pemilihan Cafe Terbaik Menggunakan Metode Analytical Hierarchy Process (AHP)," Expert – Jurnal Management Sistem Informasi dan Teknologi, vol. 8, No. 1, pp. 29-38, 2018. [Online]. Available: https://doi.org/ 10.36448/JM-SIT.V8I1.1049

[9] R. Nugraha. R, D. Gustian, D, "Sistem Pendukung Keputusan Penerimaan Bantuan Sosial dengan Metode Fuzzy Analytical Hierarchy Process," Jurnal Sisfokom (Sistem Informasi Dan Komputer), vol. 11, no. 1, pp. 87–92, 2022. [Online]. Available: https://doi.org/10.32736/sisfokom.v11i1.1357

[10] N. Salmi, N, Z. Rustam, Z., "Naïve Bayes Classifier Models for Predicting the Colon Cancer," IOP Conference Series: Materials Science and Engineering, vol. 546, no. 5, 2019. [Online]. Available: https://doi.org/10.1088/1757-899X/546/5/052068

[11] K. Sihotang, R. Ghaniy, "Penerapan Metode Naïve Bayes Classifier untuk Penentuan Topik Tugas Akhir pada Website Perpustakaan STIKOM Binaniaga.," Jurnal Ilmiah Teknologi-Informasi dan Sains (TeknoIS), vol. 9, pp. 63–72, 2019. [Online]. Available: https://doi.org/10.36350/jbs.v9i1.7

[12] R. Hermawan, A. Hidayat, V. G. Utomo, "Sistem Informasi Penjadwalan Kegiatan Belajar Mengajar Berbasis Web (Studi Kasus : Yayasan Ganesha Operation Semarang)," IJSE – Indonesian Journal on Software Engineering, vol. 2, no. 1, pp. 31-38, 2016. [Online]. Available: https://ejournal.bsi.ac.id/ejurnal/index.php/ijse/article/view/603/494

[13] Y. S. Dwanoko, "Implementasi Software Development Life Cycle (SDLC) dalam Penerapan Pembangunan Aplikasi Perangkat Lunak," Jurnal Teknologi Informasi: Teori, Konsep dan Implementasi, vol. 7, No. 2, pp. 83-93, 2016. [Online]. Available: https://doi.org/10.36382/jti-tki.v7i2.219

[14] Okfalisa, H. Rusnedy, D. U. Iswavigra1, B. Pranggono, E. Haerani, T. Saktioto, "Decision Support System For Smartphone Recommendation: The Comparison of Fuzzy AHP And Fuzzy ANP in Multi-Attribute Decision Making," Sinergi, vol. 25, No. 1, pp. 101-110, 2021. [Online]. Available: https://publikasi.mercubuana.ac.id/index.php/sinergi/article/view/9516/4038

[15] O. Arifin, T. B. Sasongko, "Analisa Perbandingan Tingkat Performance Metode Support Vector Machine dan Naïve Bayes Classifier untuk Klasifikasi Jalur Minat SMA," Semin. Nas. Tekn. Inform. dan Multimedia, no. 9, pp. 1–6, 2016. [Online]. Available: