VIKOR METHOD FOR INDONESIAN TEXT SUMMARIZATION

Hadiana Novia P.,[1,]Nelly Indriani W., S.Si., MT[2]

[1.2]Technical Information - University Computer Indonesia
Bandung Jalan Dipatiukur 112-116
E-mail: [1]hadiananovia @ yahoo. com, [2]nelly.indriani@email.unikom.ac.id

ABSTRACT

Vikor method is a method that does not require training data as a reference of its output. This method optimizes the attributes - attributes that are available to produce the required output. This study aimed to test the accuracy of the method Vikor who have perangkingan good results in the field, to be applied in the field of automatic text summary. Stages of summary automatic text that will be conducted are text input reception, preprocessing, extracting some features such as: the position of the sentence, word frequency, key words, resemblance to the title, the centrality, the sum of the weights of connections between sentences and phrases that contain the word numerically. Furthermore, the results of feature extraction is used as fill Vikor method. Having obtained the rank of the entire sentence, then sorting out 50% of the sentence based on the value output Vikor method. Based on test results, namely intrinsic ROUGE 50 test data concluded that summary automatic text on a single document using Vikor method produces flat - a pretty good price is a recall of 74.10%, precission 67.35% and 69.97% f-measure.
Keywords: Methods Vikor, summary Text Auto, Algorithms, Optimization, MCDM.

1. INTRODUCTION

summary automatic captions (automatic text summarization) is the manufacture of a shorter form of a text by utilizing applications that are run and operated on a computer [1]. A summary of the text that is produced from one or several text, which contains information from the original text and the summary results of no more than half the length of the original text [2]. summary automatic text extraction approach is summary technique by means generate a summary document by words - words or phrases - sentences in the text of origin based on the level of importance [3].

The workings of classification algorithms on automatic text summary generally apply pattern recognition occurs in the dataset data (training data). Among them is the use of Naïve Bayes algorithm in classification cause the results of the calculation of the classification algorithm will always depend on the training data are used [4]. In a previous study using the MCDM (multi-criteria decision making), which aims to design the best alternative is the method Differetial Evolution [5]. In the study, using 50 datasets and feature - a feature that is used is a position itur sentence, word frequency, key words, the similarity with the title and centrality. The study resulted in the average - average below 50% of system testing. The results are influenced by the method of calculation process itself is the mutation and crossover. Mutation and crossover is a method of DE to optimize the results of a fitness value to generate a new population [6].

This research will use MCDM method is Vikor whose purpose is to select the best alternative based on the available alternatives [5]. Vikor method does not require training data, because the dataset used is the test data at the same time training data. According to the study titled "Vikor Technique: A Systematic Review of the State of the Art Literature on Methodologies and Application", said this method is the most frequently used method the scientists compared more MCDM method [7]. This is supported by other research which states Vikor method can make perangkingan alternative compromise of a number of alternatives exist well [8]. But research Vikor rarely used in science. In the study conducted Widiastuti NI has concluded that the method was able to generate a sequence Vikor sentences that can be considered as a summary of the results. But still need to measure how well the results of accuracy and automatic summary needs of the rankings - phrases to be used as a summary sentence in a document can be met by Vikor [4].

Based on these descriptions, the research conducted with the aim to produce a summary of the relevant text and test the accuracy of the method Vikor. Therefore conducted a study with the title "Method for summary Text Speak Vikor Indonesia".

2. METHODS

In this study will be used Vikor method for automatic text summary Indonesian language, which is used as a method Vikor optimization methods. The early stages of this research is the analysis of the data entered, where the data is entered must be in the form of text. Furthermore, the data enter the text background research will go through the text *preprocessing,*and then through a calculation based on the features - features that have been determined, then assigned weights to each of the existing

features by specialists or experts in the field summary Indonesian and eventually will be processed using methods Vikor to produce a text summary of the results.

Automatic text analysis summary system is built by having four main stages as in **Figure**1.

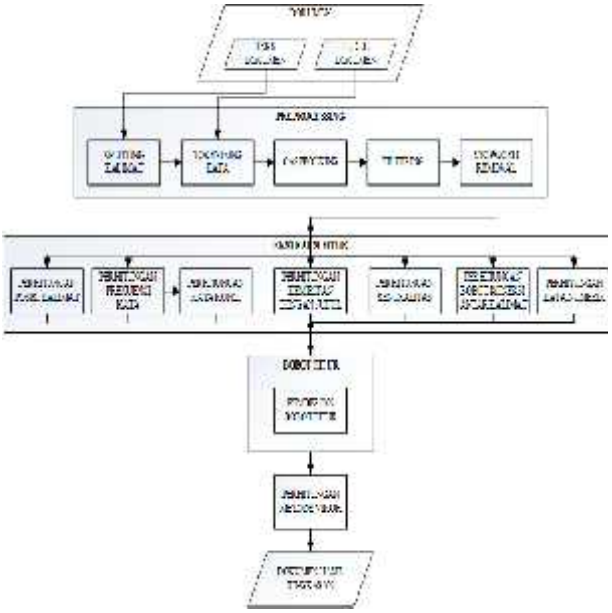


Figure 1. OverviewSystem

2.1 *preprocessing*

Analysis *preprocessing of* the phases *preprocessing* is done to obtain the documents free of words or symbols that are not needed that may interfere with the accuracy of the calculation of the feature extraction stage. Stages of *preprocessing* can be seen in **Figure** 2:

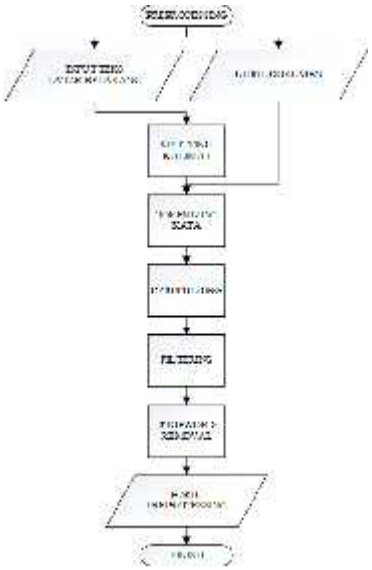


Figure 2. *Preprocessing*

In **Table 1** is a document used as examples in this journal. The document has been through the stages of *preprocessing* such as *splitting* the sentence, *tokenisasi* said, casefolding, *filtering* and *stopword*removal.

Table 1. Results of *preprocessing*

No	Sentence
K1	smpn 3 rangkasbitung terletak jl jendral sudirman no 47 rangkasbitung banten sekolah menengan pertama negeri agama islam pegangan utama pendidikan agamanya
K2	absensi siswa memegang peranan proses kegiatan belajar
K3	dimana absensi salah penunjang mendukung motivasi kegiatan didalamnya
K4	disamping absensi siswa informasi kedisiplinan siswa bersangkutan
K5	sisten absensi manual mengalami kemajuan memanggil persatu siswa didata kehadirannya disediakan absensi kelas dinamakan agenda kelas terpotong memanggil siswa persatu belajar mengajar maksimal
K6	proses rekap absensi guru piket berkeliling mengambil agenda kelas kelas
K7	dinilai siswa menitipkan absensi
K8	dibutuhkan sistem menangani titip absensi menerapkan sistem absensi berbasis pendeteksi pengenalan wajah wajah identifikasi manusi ditiru
K9	lihat hasil penelitian metode viola jones sistem pendeteksi wajah memiliki kelebihan ketepanan dibandingkan metode lainnya akurasi 90%
K10	memiliki kekurangan menentukan wajah gambar memiliki wajah tegak
K11	posisi wajah tegak tegak menentukan keberhasilan deteksi wajah
K12	metode pendeteksian wajah rata rata 15 detik sampel diuji2
K13	penelitian wajah metode eigenface
K14	eigenface salah algoritma pengenalan wajah berdasar principal component analysis pca mereduksi citra berdimensi berdimensi rendah memaksimalkan jara citra wajah database memiliki kompleksitas komputasi sederhana algoritma menunjukan hasil optimal pengenalan wajah 96%3
K15	berdasarkan permasalahan diuraikan diatas membangun sistem absensi siwa berbasis pendeteksi wajah metode viola jones media membantu sekolah mengatas siswa menitipkan absen

2.2 feature extraction

In the feature extraction analysis will describe the extraction process Features- features of the sentence - the sentence in the document that has been through astage. *preprocessing*Features - features that will be extracted include the position of the sentence in the document, word frequency, key words, sentence similarity with the title on the document, the centrality, the sum of the weights of connections between sentences and sentences that contain numeric. In **figure 3** is an example of the processing of the features - features.

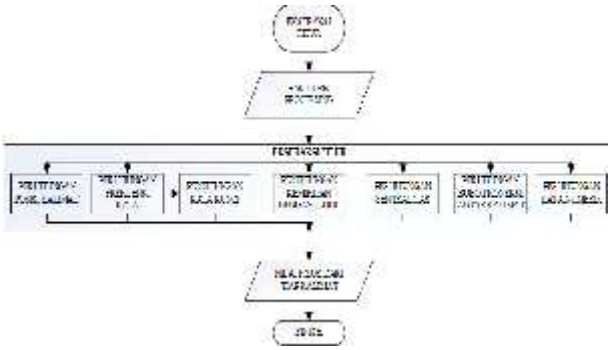


Figure 3.Extraction Feature

Position 2.2.1 Sentence

This feature is a vital feature that is used in determining a sentence in the document meaningless. In scientific documents, important sentences in a paragraph is usually located at the beginning and end. The value is calculated using the formula (1) as follows [9]:

$$Posisi\ Kalimat = Max\ \frac{1}{i}, \frac{1}{n-i+1} \quad (1)$$

Where:

i = sequence of sentences in the document

n = the number of sentences in the document

Results of the sentence position features can be seen in **Table 2.**

Table 2. Outstanding Features Sentences

Sentence	Posisi Sentence
K1	$Max\ \frac{1}{1}, \frac{1}{15-1+1} = 1$
K2	$Max\ \frac{1}{2}, \frac{1}{15-2+1} = 0,5$
K3	$Max\ \frac{1}{3}, \frac{1}{15-3+1} = 0,3333$
K4	$Max\ \frac{1}{4}, \frac{1}{15-4+1} = 0,25$
K5	$Max\ \frac{1}{5}, \frac{1}{15-5+1} = 0,2$
K6	$Max\ \frac{1}{6}, \frac{1}{15-6+1} = 0,1667$
K7	$Max\ \frac{1}{7}, \frac{1}{15-7+1} = 0,1429$
K8	$Max\ \frac{1}{8}, \frac{1}{15-8+1} = 0,125$
K9	$Max\ \frac{1}{9}, \frac{1}{15-9+1} = 0,1429$
K10	$Max\ \frac{1}{10}, \frac{1}{15-10+1} = 0,1667$
K11	$Max\ \frac{1}{11}, \frac{1}{15-11+1} = 0,2$
K12	$Max\ \frac{1}{12}, \frac{1}{15-12+1} = 0,25$
K13	$Max\ \frac{1}{13}, \frac{1}{15-13+1} = 0,3333$
K14	$Max\ \frac{1}{14}, \frac{1}{15-14+1} = 0,5$
K15	$Max\ \frac{1}{15}, \frac{1}{15-15+1} = 1$

2.2.2 Frequency Words / TF-ISF

significance of a word can be determined by frequency of occurrence in a paragraph. So we use a method to extract the words of the paragraph, namely frequency tf-ISF. TF-ISF is a method used to evaluate the significance of a word in a sentence document. Tf-ISF can be calculated using the formula (2) and (3) the following [9]:

$$isf = log\ \frac{N}{n_i} \quad (2)$$

Where:

N = the number of sentences in the document

ni = number of sentences containing the word i-th

$$Frekuensi\ Kata = Tf_i * isf \quad (3)$$

Where:

Tf_i = number of words in the sentence to-i

Value calculation frekuenssi word for the entire document can be seen in table 3.

table 3. Frequency wordsFeatures

Sentence	∑ TF-ISF
K1	23,221
K2	57,276
K3	79,037
K4	59,316
K5	220,399
K6	96,538
K7	28,013
K8	132,141
K9	154,852
K10	73,384
K11	68,155
K12	79,616
K13	33,242
K14	319,416
K15	192,407

2.2. 3 keyword

this feature will calculate the value of a keyword, where keywords obtained from the 10 words that often appear in the text. Once the keywords are found, every word the same as the keyword will be assigned a value of 0.1 and that do not fit are rated 0 [10].

Table 4. Occurrences Most10 Kata

No	Kata	Jumlah
1	wajah	12
2	absensi	10
3	siswa	8
4	sistem	5
5	metode	5
6	kelas	4
7	memiliki	4
8	pengenalan	3
9	penelitian	3
10	tegak	3

Having obtained 10 most frequent words with the appearance of the document as shown in **table**4,the word is considered important. Then it must occur in a sentence would be worth 0.1. The results from the sum of all the keywords in each statement can be seen in **Table**5.

Table 5. Results Feature Keyword

Sentence	∑ Total Bobot
K1	0
K2	0,2
K3	0,1
K4	0,3
K5	0,7
K6	0,3
K7	0,2
K8	0,7
K9	0,6
K10	0,5
K11	0,4
K12	0,2
K13	0,2
K14	0,6
K15	0,7

2.2.4 Similarities With Title

Title contains a set of words that give important direction of the concept of a paragraph. If the words in a sentence has many similarities with the word in the title, the value for the sentence is calculated as follows [11]:

$$Kemiripan = \frac{|Kata\ di\ judul \cap kata\ di\ Kalimat(i)|}{|Kata\ di\ judul \cup kata\ di\ Kalimat(i)|} \quad (4)$$

Example token title on the document can be seen in **Table**6.

Table 6. TokenTitle Document

No	Token
1	Implementasi
2	Metode
3	Viola
4	Jones
5	Sistem
6	Absensi
7	Siswa
8	Berbasis
9	Pendeteksi
10	Wajah
11	Studi
12	Kasus

No	Token
13	SMPN
14	3
15	Rangkasbitung

Results calculated similarity with the title features can be seen in **Table**7.

Table 7. Document TitleToken

Sentence	Weight
K1	0.1176
K2	0.0952
K3	0.0455
K4	0.1429
K5	0.1351
K6	0.0417
K7	0.1111
K8	0.2667
K9	0.1935
K10	0.087
K11	0.0909
K12	0.0909
K13	0.0556
K14	0.0667
K15	0.2778

2.2.5 Centrality

Centrality of a sentence stating resemblance to the sentence other. Also mentioned in the journal [12] that the centrality of the vocabulary overlap between the two sentences. When a sentence has a higher centrality, then the sentence is the best candidate to put into the summary results. Therefore, in this study to find the value of the centrality of a sentence then made to match against other sentences to be found the greatest centrality value possessed of a sentence as shown in **Table**8.The value is calculated based on the formula (5) follows [13]:

$$Sentralitas = \frac{|Katadi\ Kalimat(i) \cap katadi\ Kalimat(j)|}{|Katadi\ Kalimat(i) \cup katadi\ Kalimat(j)|} \quad (5)$$

Where:
i = index-sentence toi
sentencej = index other than i

Table 8. Results Featurescentrality

Sentence	Bobot
1	0.0238
2	0.2143
3	0.1333
4	0.2727
5	0.2121
6	0.2121
7	0.2727
8	0.2105
9	0.1795
10	0.4118
11	0.4118
12	0.125
13	0.1429
14	0.2
15	0.2105

2.2.6 connection between sentences

connection between sentences is the number of sentences that have the same word in another sentence in the document [14].

$$score\ f_1\ K = jumla koneksi\ antar - kalimat \quad (6)$$

Then add up the weights of connections between sentences.

$$Score\ f_1\ K = \sum Koneksi\ antar\ kalimat \quad (7)$$

Table 9 is the result of the calculation of the existing connection of each sentence.

Table 9. Results Features SentenceConnection Between

Sentence	∑ Bobot
1	1
2	19
3	11
4	21
5	38
6	15
7	17
8	46
9	29
10	27
11	23
12	15
13	7
14	35
15	48

Sentences ContainingNumerical Data

On thetext summary should consider the numerical data, as in the sentence that contains numeric data are important quantity [11].

$$Numerik = \frac{\sum data\ angka\ dalam\ kalimat\ K}{length\ (K)} \quad (8)$$

Data number that appears will be given a value of 0.1 and summed each sentence as shown in **Table**10.

Table 10. Results of Numerical Features

Sentence	Weight Sentence
K1	0.1
K2	0
K3	0
K4	0.1429
K5	0
K6	0
K7	0
K8	0
K9	0.0588
K10	0
K11	0
K12	0:25
K13	0
K14	0.0322
K15	0

After all the extracted features didapatlah sentence interest level of each feature as shown in **table**11.

Table 11. Results Feature Extraction

	F1	F2	F3	F4	F5	F6	F7
K1	1	23.221	0.1	0.117	0.023	0.1	1
K2	0.5	5.7276	0.4	0.095	0.214	0	19
K3	0.33	7.9037	0.2	0.045	0.133	0	11
K4	0.25	5.9316	0.3	0.142	0.272	0.142	21
K5	0.2	22.039	0.5	0.135	0.212	0	38
K6	0.16	9.6538	0.2	0.041	0.212	0	15
K7	0.14	2.8013	0.2	0.111	0.272	0	17
K8	0.12	13.214	0.6	0.266	0.210	0	46
K9	0.14	15.485	0.6	0.193	0.179	0.058	29
K10	0.16	7.3384	0.4	0.086	0.411	0	27
K11	0.2	6.8155	0.2	0.090	0.411	0	23
K12	0.25	7.9616	0.2	0.090	0.125	0.25	15
K13	0.33	3.3242	0.2	0.055	0.142	0	7
K14	0.5	31.941	0.4	0.066	0.2	0.032	35
K15	1	19.240	0.7	0.277	0.210	0	48

2.3 Peembobotan features

Giving weight to the methods Vikor feature is very influential. Because of the weight of a given feature will be used as a value W on the calculation method of Vikor. Giving these weights are generally provided by the expert [4], which is considered the expert with experience in related field. In this case summary This automatic text feature weighting is given by an expert from the field of Indonesian literature that Mahmud Fasya MA from the University of Indonesia (UPI). The level of importance weights feature or features used in this study are given weights as follows: sentence position (F1) 14.29%, word frequency (F2) 17.86%, keywords (F3) 21.43%, similarity sentences with title (F4) 25%, centrality (F5) 10.71%, said numeric (F6) 3.57% and the weight of connections between sentences (F7) 7.14%.

2.4 Method *Vikor*

MethodVikor is a Multi-Criteria Decision Making (MCDM) that the algorithm serves to determine the ranking of the alternatives - alternatives are there to see the results of the value - the value of the utility and regrets of any existing alternative. The steps - steps should be taken to perform calculations on Vikor method [11].

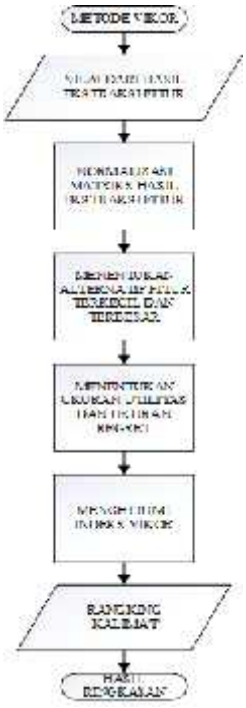


Figure 4. Method *Vikor*

2.4.1Normalization Feature

Doing normalizationfor feature extraction process produces a new decision matrix of the data sentence and features - features that have been obtained from the previous process. Normalization this feature is implemented by the calculation (9) below:

$$f_{ij} = \frac{L_{ij}}{\sqrt{\sum_{i=1}^{m} L_{ij}^2}}, i = 1, \dots, m; j = 1, \dots, n \quad (9)$$

where Lij is the element matrix on line i of column j and m is the number of features, in this case there are 7 features. Results of normalization fitura extraction results are shown in **Table 12.**

Table 12. Normalizedfeature

fij	F1	F2	F3	F4	F5	F6	F7
K1	0.574	0.408	0.000	0.217	0.026	0.320	0.010
K2	0.287	0.101	0.116	0.175	0.234	0.000	0.182
K3	0.191	0.139	0.058	0.084	0.146	0.000	0.105
K4	0.143	0.104	0.175	0.263	0.298	0.458	0.201
K5	0.115	0.387	0.408	0.249	0.232	0.000	0.364
K6	0.096	0.170	0.175	0.077	0.232	0.000	0.144
K7	0.082	0.049	0.116	0.205	0.298	0.000	0.163
K8	0.072	0.232	0.408	0.491	0.230	0.000	0.441
K9	0.082	0.272	0.349	0.356	0.196	0.188	0.278
K10	0.096	0.129	0.291	0.160	0.450	0.000	0.259
K11	0.115	0.120	0.233	0.167	0.450	0.000	0.220
K12	0.143	0.140	0.116	0.167	0.137	0.801	0.144
K13	0.191	0.058	0.116	0.102	0.156	0.000	0.067
K14	0.287	0.562	0.349	0.123	0.218	0.104	0.335
K15	0.574	0.338	0.408	0.511	0.230	0.000	0.460

2.4.2 Determiningideal solution

Determining theideal positive solution and negative ideal solution. Positive Solutions ideal is when a large indexed features and declared it was the best and the negative ideal solution is when an indexed feature small and declared it was the best. Determining the ideal solution can be calculated by the formula (10) as follows:

$$A^* = \{\max f_{ij} | i = 1,2, \dots, m$$
$$= \{f_1^*, f_2^*, \dots, f_i^*, \dots, f_n^*\}$$
$$A^- = \{\min f_{ij} | i = 1,2, \dots, m$$
$$= \{f_1^-, f_2^-, \dots, f_i^-, \dots, f_n^-\}$$

Where:

A * = the maximum value of the feature (f) normalized

A^- = minimum value of the feature (f) normalized

minimum optimal value and optimal maximum can be seen in **table 13.**

table 13. value Ideal Solution featuresEvery

Solusi Ideal	F1	F2	F3	F4	F5	F6	F7
A-	0.072	0.049	0	0.077	0.026	0	0.010
A*	0.574	0.562	0.408	0.511	0.45	0.801	0.460

2.4.3 Counting Utilities (S) and regret (R)

Calculating the value or size of the utility (S) and regret (R) of each of the criteria used. The size of the size of the utility (S) and regret (R) of each criterion in the alternative may be obtained by formula (11) and (12) as follows:

$$S_i = \sum_{j=1}^{n} W_j \frac{(f_j^* - f_{ij})}{(f_j^* - f_j^-)} \quad (11)$$

$$R_i = max_j \; W_j \frac{f_j^* - f_{ij}}{f_j^* - f_j^-} \quad (12)$$

Where:

W = the weight of feature

f_{ij} = value feature the results of the normalization of features

f^* ideal= value maximum features

f^- = ideal feature value of at least

S_i = the value of Utilities sentence to -i

R_i = the greatest value from the calculation of the utility to-i

utility and regretvalue can be seen in **table**14.

Table 14. Value Utilities and Regret

Sentence	S	R
1	0.6373	0.2143
2	0.7231	0.1934
3	0.8547	0.246
4	0.6419	0.1594
5	0.4485	0.1511
6	0.7861	0.25
7	0.7694	0.1786
8	0.3637	0.1429
9	0.481	0.14
10	0.6178	0.202
11	0.6481	0.1979
12	0.7498	0.1979

Sentence	S	R
13	0.8449	0.2353
14	0.4452	0.2235
15	0.1691	0.0778
Nilai Maksimal	0.8547	0.25
Nilai Minimum	0.1691	0.0778

2.4.4 method of Calculating Index *Vikor*

Vikor index is used to display the best sentence that will be used as the summary results. Calculating the index Vikor by way mengsubstitusikan Utilities (Si) and Regret (Ri) into the equation with the index Vikor on alternatives to-i as in equation (13), where the value of v in this study used is a 0.1-0.9.

$$Q_i = v \frac{S_i - S^-}{(S^* - S^-)} + (1 - v) \frac{R_i - R^-}{(R^* - R^-)} \quad (13)$$

Where:

v = value weight Vikor predetermined index (0,1 - 0.9) was

Ki = value line utilities to-i

S^*= the maximum value *of utility*

S^-= minimalvalue *utility*

Ri = the value of *regret* at the sentence to - i

R^*= the maximum value *regret*

R^-= minimum value *regret*

2.4.5rank BasedIndex *Vikor*

Vikor index value obtained in the previous stages, will be ranked to determine the best sentence to the summary results. Perangkingan results summary Vikor method is determined based on the smallest Vikor index [8]. Results summarymethods *Vikor* can be seen in **Table 15.**

Table 15. Results ofsummaryMethod *Vikor*

Sentence	Sentence
4	Disamping itu, absensi siswa juga sebagai informasi tentang bagaimana kedisiplinan siswa yang bersangkutan[1].
5	Sistem absensi manual saat ini sudah mengalami kemajuan dari yang sebelumnya dengan memanggil satu persatu siswa untuk didata kehadirannya sekarang sudah disediakan absensi kelas yang dinamakan agenda kelas, hal ini dikarenakan agar waktu tidak terpotong untuk memanggil siswa satu persatu sehingga waktu belajar mengajar dapat lebih maksimal
7	Hal tersebut dinilai masih kurang baik karena siswa dapat menitipkan absensi
8	Maka dari itu dibutuhkan sistem yang dapat menangani titip absensi dengan menerapkan sistem absensi berbasis pendeteksi dan pengenalan wajah hal ini dikarenakan wajah adalah bagian identifikasi manusia yang tidak bisa ditiru.
9	Di lihat dari hasil penelitian sebelumnya, Metode Viola Jones pada sistem pedeteksi wajah memiliki kelebihan dalam ketepatan dibandingkan dengan metode yang lainya dengan akurasi 90%
10	Namun memiliki kekurangan yaitu tidak dapat menentukan wajah pada gambar yang memiliki wajah tidak tegak atau tidak frontal
14	Eigenface merupakan salah satu algoritma pengenalan wajah berdasar pada Principal Component Analysis (PCA) untuk mereduksi citra berdimensi tinggi menjadi berdimensi rendah yang akan memaksimalkan jarak antara semua citra wajah dalam database, memiliki kompleksitas komputasi yang cukup sederhana, algoritma ini menunjukan hasil yang cukup optimal dalam pengenalan wajah 96%[3].
15	Berdasarkan permasalahan yang telah diuraikan diatas, maka penelitian ini dimaksudkan untuk membangun sistem absensi siswa berbasis pendeteksi wajah dengan metode viola jones sebagai media yang dapat membantu pihak sekolah mengatasi siswa dalam hal menitipkan absen.

3. DISCUSSION

The tests are performed to test the accuracy of the method *Vikor* in the field of automatic text summary. In this test used 50 data background text documents thesis research. The results of the summary produced by the system will then be compared with the results generated by the manual summary Indonesian expert who is a graduate of Bachelor of Literature Indonesia, given the case studies that are taken in this study are in Indonesian language text documents. Then also conducted testing ROUGE [15] on the outcome document and the results of the manual system.

The results of testing the accuracy of the method *Vikor* on 50 documents can be seen in Table 11.

Table 16. Results ROUGE 50 TestData

Manual	*System*	*Recall*	*Precision*	*f-measure*
dok1	Sys1.TXT	67.72%	59.78%	63.50%
dok2	Sys2.TXT	84.62%	79.04%	81.73%
dok3	Sys3.TXT	73.12%	72.84%	72.98%
dok4	Sys4.TXT	68.60%	51.88%	59.08%
dok5	Sys5.TXT	82.98%	66.67%	73.93%
dok6	Sys6.TXT	99.52%	99.52%	99.52%
dok7	Sys7.TXT	75.46%	51.58%	61.28%
dok8	Sys8.TXT	83.78%	55.03%	66.43%
dok9	Sys9.TXT	81.85%	85.38%	83.58%
dok10	Sys10.TXT	60.88%	52.65%	56.47%

Manual	*System*	*Recall*	*Precision*	*f-measure*
dok11	Sys11.TXT	66.32%	64.51%	65.40%
dok12	Sys12.TXT	71.68%	60.00%	65.32%
dok13	Sys13.TXT	49.82%	60.87%	54.80%
dok14	Sys14.TXT	60.98%	48.08%	53.76%
dok15	Sys15.TXT	66.91%	68.89%	67.88%
dok16	Sys16.TXT	75.17%	65.19%	69.83%
dok17	Sys17.TXT	80.95%	43.59%	56.67%
dok18	Sys18.TXT	43.75%	57.04%	49.52%
dok19	Sys19.TXT	88.24%	77.83%	82.71%
dok20	Sys20.TXT	77.14%	45.00%	56.84%
dok21	Sys21.TXT	79.79%	82.80%	81.27%
dok22	Sys22.TXT	64.96%	58.92%	61.79%
dok23	Sys23.TXT	88.31%	82.64%	85.38%
dok24	Sys24.TXT	73.62%	67.03%	70.17%
dok25	Sys25.TXT	72.52%	72.24%	72.38%
dok26	Sys26.TXT	67.46%	74.10%	70.63%
dok27	Sys27.TXT	85.25%	42.28%	56.52%
dok28	Sys28.TXT	83.72%	74.07%	78.60%
dok29	Sys29.TXT	78.30%	56.08%	65.35%
dok30	Sys30.TXT	58.77%	38.99%	46.88%
dok31	Sys31.TXT	89.47%	78.81%	83.80%
dok32	Sys32.TXT	72.18%	74.42%	73.28%
dok33	Sys33.TXT	74.60%	77.41%	75.98%
dok34	Sys34.TXT	56.46%	48.56%	52.21%
dok35	Sys35.TXT	79.43%	62.61%	70.03%
dok36	Sys36.TXT	72.47%	66.15%	69.17%
dok37	Sys37.TXT	100.00%	100.00%	100.00%
dok38	Sys38.TXT	71.19%	76.36%	73.68%
dok39	Sys39.TXT	86.73%	83.40%	85.03%
dok40	Sys40.TXT	73.28%	65.31%	69.07%
dok41	Sys41.TXT	69.23%	70.31%	69.77%
dok42	Sys42.TXT	67.46%	53.46%	59.65%
dok43	Sys43.TXT	79.45%	83.25%	81.31%
dok44	Sys44.TXT	61.49%	75.83%	67.91%
dok45	Sys45.TXT	75.60%	81.87%	78.61%
dok46	Sys46.TXT	82.51%	84.36%	83.43%
dok47	Sys47.TXT	79.00%	81.55%	80.26%
dok48	Sys48.TXT	60.13%	55.76%	57.86%
dok49	Sys49.TXT	73.98%	65.61%	69.54%
dok50	Sys50.TXT	67.94%	67.94%	67.94%

Manual	*System*	*Recall*	*Precision*	*f-measure*
Rata - Rata		74.10%	67.35%	69.97%

Based on the results obtained,method *Vikor* has the best accuracy rate of 100%. The researcher also testing againstindex value *Vikor* with the best accuracy. The test is done using the formula (14):

$$Accuracy = \frac{\sum Kalimat\ Sistem\ yang\ relevan\ dengan\ Hasil\ Manual}{\sum Kalimat\ Sistem\ yang\ muncul}$$

(14)

Testing index aims to look at the best index based on the application of the methods of Vikor. The test results are illustrated in the chart index (5):

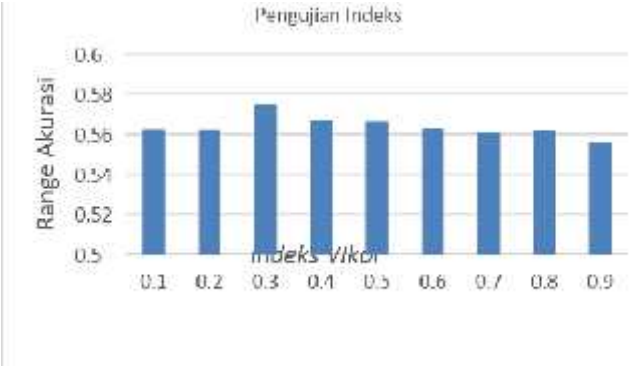


Figure 5. Graph Index *Vikor*

indexFrom the test results concluded that the index with best accuracy rate is 0.3 with a value - average system testing 0.5753 or 57.53%.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusion

Based on the research that has been done, the application method for summary text Vikor good enough. The statement was supported by the results of the average - average test accuracy for 50 test data using methods ROUGE. The test resulted in the value of value - average recall is 74.10%, precission 67.35% and 69.97% f-measure.

4.2 Recommendations

summary process text using Vikor method in this study using feature weights given by one expert only. Involve more experts can produce more accurate weight features, so the value of the accuracy of the method could Vikor better. Since the results of the method Vikor heavily dependent on the weight of each of the features provided by the experts.

References

[1] Muchammad, Mustaqhfiri, Z. Abidin and R. Kusumawati, "Automatic Text summary Indonesia Net News Method Using Maximum Marginal Relevance," matics, vol. 4, no. 4, pp. 134-147, 2011.

[2] N. Bhatia and A. Jaiswal, "Trends in the Extractive and abstractive Techniques in Text Summarization," International Journal of Computer Applications, vol. 117, no. 6, pp. 0975-8887, 2015.

[3] A. Ridok, "summary Indonesian Document-Based Non-Negative Matrix Factorization (NMF)," Journal of Information Technology and Computer Science (JTIIK), vol. 1, no. 1, pp. 39-44, 2014.

[4] NI Widiastuti, "Design Basics: Vikor for summary Automatic," vol. 2, 2017.

[5] AR Hadiguna, AGROINDUSTRI Supply Chain Management: Sustainable Approaches to Performance Measurement and Risk Assessment, Padang: Andalas Univerity Press, 2016.

[6] F. Prasydani and NI Widiastuti, "Implementation Methods DIFFERENTIAL EVOLUTION In summary Text Indonesian language ".

[7] A. Mardani, EZ Kazimieras, K. Govindan, US Amat and A. Jusoh, "Vikor Technique: A Systematic Review of the State of the Art Literature on Methodologies and Applications," Sustainability, vol. 8, pp. 1-38, 2016.

[8] NPN Hendayanti and IKP Suniantara, "Bali STIKOM Scholarships Admission Selection Method Using Vikor," Statistics, vol. 5, no. 1, 2017.

[9] K. Nandhini and S. Balasundaram, "Extracting easy to understand summary using differential evolution algorithm," Swarm and Evolutionary Computation, vol. 16, pp. 19-27, 2014.

[10] H. Edmundson, "New Methods in Automatic Extracting," Journal of the ACM (JACM), vol. 16, no. 2, pp. 264-285, 1969.

[11] Aristotle, "Application of Genetic Algorithm in Text Documents summary Indonesian," Proceedings Semirata Lampung State University, 2013.

[12] B. Age and E. Winarko, "Sentence Feature Analysis for Automated Text summary in Indonesian ".

[13] R. Ferreira, L. d. S. Cabral, RD Lins, G. Pereira e Silva, F. Freitas, GD Cavalcanti, R. Lima, SJ Simske and L. Favaro, "Assessing sentence scoring techniques for extractive text summarization," Expert Systems with Applications, vol. 40, no. 14, pp. 5755-5764, 2013.

[14] Zulkifli, A. Toto W and G. Septiana, "Weighted Feature Extraction on summary Indonesian Text Using Genetic Algorithm," Proceedings of the e-Engineering, vol. 2, no. 2, p. 6481, 2015.

[15] A. Wahib, ZA Arifin and D. Purwitasari, "Speak English summary Documents Using Local Distribution Sentence," Wahib, vol. VII, no. 1, 2016.