APPLICATION OF KNOWLEDGE MANAGEMENT SYSTEM IN SMK YAMABA PURWAKARTA

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ABSTRACT

SMK Yamaba Purwakarta is a Vocational High School under the auspices of Yayasan Anak Bangsa Mahabakti located in Purwakarta district. In supporting and providing quality education and a good field of school curriculum on duty to check the suitability of the material and syllabus of the course from the existing school. The problems that occur in SMK Yamaba is the field of school curriculum difficult to check the suitability of the syllabus and the subject matter that is given the teacher to the student, the impact when there are new teachers to teach in schools these teachers find it difficult to adjust the materials and syllabi from previous teachers ever taught. this is due to the lack of documented knowledge sharing of every teacher to be able to save the material and process the syllabus and learning materials.

By applying the concept of Knowledge Management, Highschool Vocational Yamaba Purwakarta can manage both easy to manage knowledge (explicit) as well as the knowledge that hard to manage (tacit) because it is the experience of each individual. SECI model used is the externalization and combination. the method used is text mining algorithms TF-IDF (Term Frequency-Inverse Document Frequency) and VSM (Vector Space Model) to find the value of similarity between the keywords and search the document for existing knowledge in the system.

Based on the results of testing the application has been built to achieve the goal of helping areas of the school curriculum syllabus and material check compliance in managing knowledge are helping ease the process of sharing knowledge between teachers.

***Keywords** : . Knowledge, Knowledge Management System, TF-IDF, VSM*

1.*INTRUDUCTION*

SMK Yamaba Purwakarta is one educational institution founded in 2013 and is still a new school. Supporting and providing quality education in order to educate the children of the children of today and the future. Education aimed at educating the nation in accordance with the opening of the 1945 Constitution, paragraph 4, and want education has a very important role in creating quality human resources. Berkualiats education will affect the progress in various fields.

In interviews with the head of the curriculum, Mr. Iman Dani S.pd in Yamaba purwakarta vocational school, school curriculum areas difficult to check the suitability of the syllabus and the subject matter that is given to the student teacher,Impact to new teachers to teach in schools these teachers find it difficult to adjust materials and syllabi from previous teachers ever taught. this is due to the lack of documented knowledge sharing of every teacher to be able to save the material and process syllabus and learning materials tersebut.Impact time when the collision occurred in the teaching of each teacher, create a new teacher must wait coworkers finished teaching in advance to be able to get the solution , resulting in a new teacher's performance in class to be blocked.

Based on these problems, we need a management information system knowledge to save instructional material and share the experience of the teacher to be useful for all new teachers and also allows other teachers to do a data search experience based on the content of the data that experience to the right, ie with the use of text mining, while for measuring the degree of similarity data content experience with keywords (keywords) that sought to algorithms

TF / IDF (Term Frequency-Inversed Document Frequency).

2. *RESEARCH RESULT*

2.1 *Definition of Knowledge Management System* (KMS)

Knowledge Management System or abbreviated KMS is an IT application that is used to support and improve the process of making knowledge in the organization and storage, retrieval, transfer and application.

2.1.1 *The 10 Stages in Knowledge Management System*

According to Amrit Tiwana there are 10 stages in the Knowledge Management system,There is:

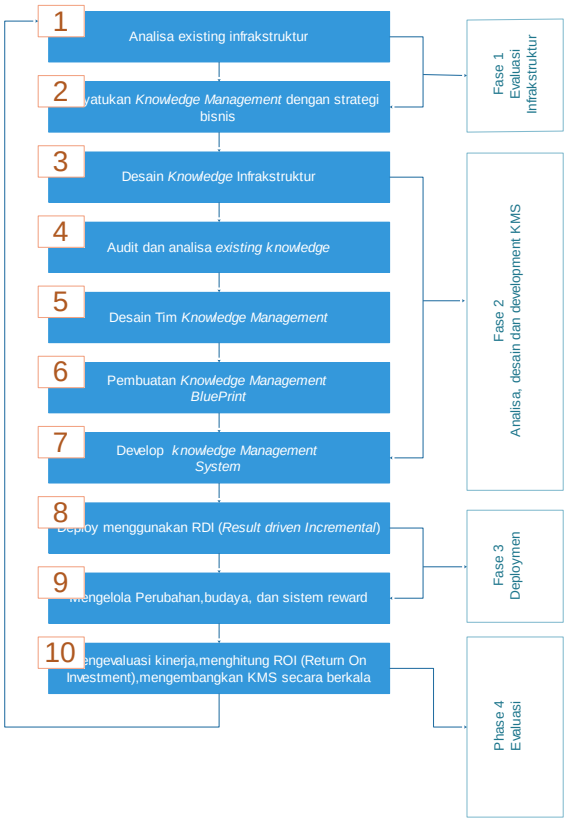


Figure 1. The 10 Stages in Knowledge Management System

2.1.2 *Text Mining*

Text Mining is the process of collecting data in the form of a text from a source in this case is the source document. With text mining can be searched keywords kat-yan can represent the contents of a document and then analyzed and matching of the document by keyword database that was created determine or choose the category of a document.

2.1.3 *Information Retrival*

Information Retrieval (IR) is how to find a document from unstructured documents that provide information needed from a huge collection of documents stored in the computer TF-IDF.

1. TF/IDF (*Term Frequency – Inversed Document Frequency*) *used to calculate the weight (W) of each document for the keywords with the formula that:*

$$W_{dt} = tf_{dt} * IDF_t$$

Where :

D = document to-d

T = word to-t from keywords

W = document weight to-d againts word to-t

Tf = *to many words to your looking at the document*

IDF = *inversed Document Frequency*

IDF = log (D/df)

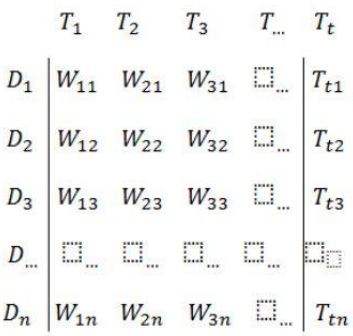
D = totally document

df = the number of documents that contain the search terms.

After weight (W) of each document is known, then the sorting process where the greater value of W, the greater the degree of similarity of the document on key words, and vice versa.

1. *Vector Space Model*

Vector Space Model is (VSM) (VSM) is a *method to look at the degree of proximity or similarity (similarity) term by term weighting method.*



	T_1	T_2	T_3	$T_{...}$	T_t
D_1	W_{11}	W_{21}	W_{31}	$\square_{...}$	T_{t1}
D_2	W_{12}	W_{22}	W_{32}	$\square_{...}$	T_{t2}
D_3	W_{13}	W_{23}	W_{33}	$\square_{...}$	T_{t3}
$D_{...}$	$\square_{...}$	$\square_{...}$	$\square_{...}$	$\square_{...}$	$\square_{\square}$
D_n	W_{1n}	W_{2n}	W_{3n}	$\square_{...}$	T_{tn}

Figure 2. *Matrix term document*

1.1.4 *Flow Stages Of TF-IDF*

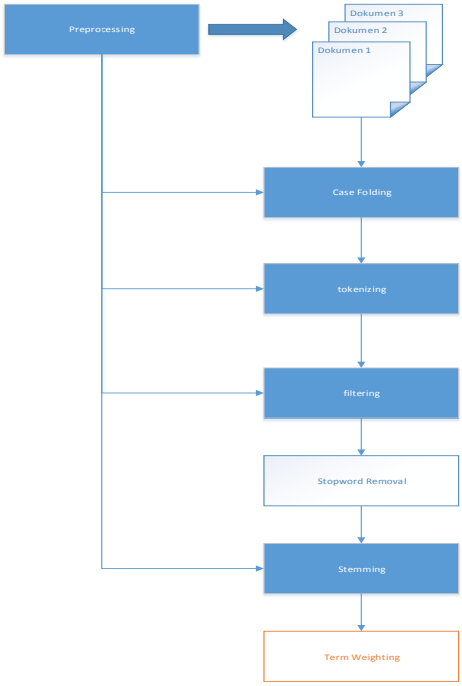


Figure 3. *Flow Stages Of TF-IDF*

2.1.5 *Calculation Of TF-IDF*

Table 1.*Calculation of tf-idf*

Td					Df	D/Df	Idf	W			
Term	Q	D1	D2	D3			Log (D/df)	Q	D1	D2	D3
Sistem	1	1	0	0	2	1,5	0,176	0,176	0,176	0	0
Komputer	1	1	0	0	2	1,5	0,176	0,176	0,176	0	0
Jaringan	0	1	0	0	1	3	0,477	0	0,477	0	0
Elektronik	0	1	0	0	1	3	0,477	0	0,477	0	0
Perangkat	0	1	0	0	1	3	0,477	0	0,477	0	0
Lunak	0	1	0	0	1	3	0,477	0	0,477	0	0
Keras	0	1	0	0	1	3	0,477	0	0,477	0	0
Database	0	0	1	0	1	3	0,477	0	0	0,477	0
informasi	0	1	1	0	2	1,5	0,176	0	0,477	0,477	0
Tugas	0	1	0	0	1	3	0,477	0	0,477	0	0
menerima	0	1	0	0	1	3	0,477	0	0,477	0	0
Sistematik	0	0	1	0	1	3	0,477	0	0	0,477	0
Operasi	1	0	0	1	2	1,5	0,176	0,176	0	0,176	0,176
Logik	0	0	0	1	1	3	0,477	0	0	0	0,477
program	0	0	0	1	1	3	0,477	0	0	0	0,477
Total								0,528	4,168	1,431	1,13

Query or searchable keywords ie "Computer Operating System", so if there is a word we input the value 1 in the column.

- D1, D2, D3 in the table column, the calculation is the number of keywords in the search in a document.

- Df is the number of keywords total of each column

-D / Df obtained from the total number of columns in the document data, for example column D1 + D2 + D3 = 3, divided by Df search results.

-IDF Obtained from Log (D / df), for example, Log (3: 1) = 0.477

- Query on W obtained from results of the IDF multiplied by Q, Td.

Weight (W) for D1 = 0,176 + 0,176 + 0= 0,352

Weight (W) for D2 = 0+ 0 + 0,176= 0,176

Weight (W) for D3 = 0 + 0 + 0,176= 0,176

The calculation above, it can be seen that the value of the weight (W) between D2 and D3memiliki same value. Therefore it is necessary to process the calculation algorithms using Vector Space Model.

2.1.6 *Calculation Vector Space Model*

Table 2. *Calculation Vector Space Model*

Term	Q	Sqrt (D1)	Sqrt (D2)	Sqrt (D3)	Q*D1	Q*D2	Q*D3
Sistem	0.031	0.031		0.031	0.031		0.031
Komputer	0.228	0.228					
Jaringan	0	0		0			
Elektronik		0.228					
Perangkat		0.228					
Lunak		0.228					
Keras		0.228					
Database							
Informasi		0.228					
Tugas			0.228				
Menerima			0.228				
Sistematik	0.031		0.031			0.031	
Operasi			0.228				
Logik			0.228				
Program			0.228	0.228			
	vSum(Q)		vSum(Di)		Sum(Q * Di)		
	0.29	1.678	1.171	0,259	0.031	0	0.031

Next calculate the cosine angle between vectors of keywords to each document by the formula:

*Cosine(Di) = sum (Q.Di)/ (sqrt(Q) * sqrt(Di))*

1. *For Document 1 (D1)*
   Cosine (D1)
   *sum(Q.D1)/(sqrt(Q)*sqrt(D1))*
   *= 0.031/(0.29*1.678)*
   = 0,063

2. *For Document 2 (D2)*

   *=0.031/(0.29*1.171)*

   = 0.091

3. *For Document 3 (D3)*

   *=0.031/(0.29*0,031)*

   = 3,483

After calculating the cosine of each document, the cosine value is generated is as follows.

Table 3.*Result Calculation*

D1	D2	D3
0,063	0,91	3,483
Ranking 1	Ranking 3	Ranking 2

2.1.7 *Context Diagram*

Context diagram is a diagram illustrating the relationship between external entities, input and output of the system. Direpsentasikan context diagram with a single circle that mewakilikeseluruhan system.

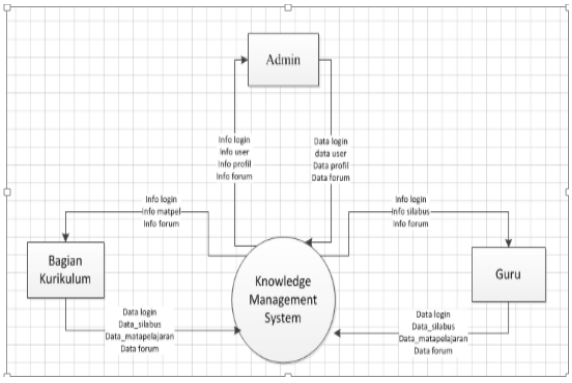


Figure 4. *Context Diagram*

2.1.8 *DFD Level 1*

Data Flow Diagram (DFD) *is a graphical representation of a system that uses a number of forms of symbols to describe how data flows through an interrelated processes.*

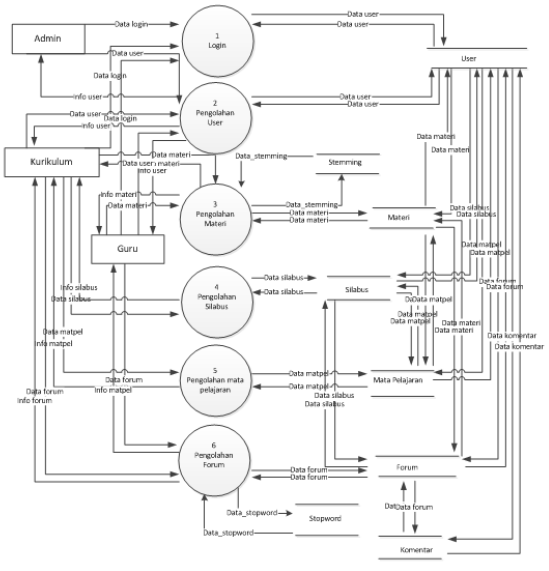


Figure 5. DFD Level 1

2.1.9 *Relationship Schema*

Describing the connectedness table in the system in detail or clear, the use of table relationships. Relationship scheme is a chain of relationships between multiple tables in the database system .Tabel relationships will be described in figure 6

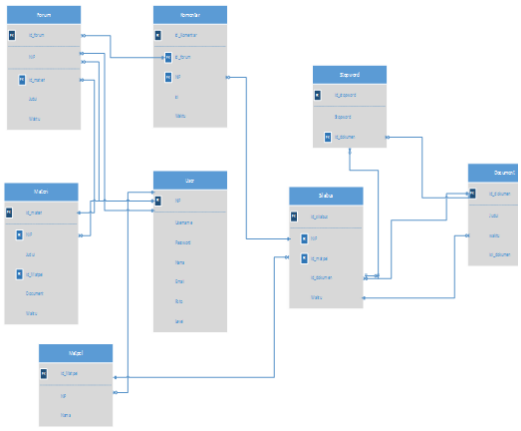


figure 6. ***Relationship Schema***

COVERING

3.1 Conclusion

Based on the results obtained in this thesis, it can be concluded as follows:

1. Knowledge management system in the wake of these can help teachers to share materials with other syllabus

2. The information system is built can facilitate curriculum areas in order to check the suitability of syllabus and materials in schools.

3. The information system is built can help teachers to be able to store and process the material and syllabus lesson from teacher to another teacher

4. Knowledge management is built this system can make it easier to be able to share experiences as well as performance monitoring vagian school curriculum.

3.2 Sugesstion

Suggestions for the development of information systems are some suggestions that can be done, among others:

1. KMS can be developed with the addition of menu items such as extracurricular activities at school, scheduling, as well as the activities in vocational schools Yamaba related activities outside associated with the school and teachers.

2. School Information can be developed into more specific, such as adding pictures, and the positive comments of students and teachers to the school environment so that the attractiveness of vocational schools Yamaba become better in the eyes of the public.

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