THE IMPLEMENTATION OF KNOWLEDGE MANAGEMENT SYSTEM ON THE ANIMAL HEALTH UNIT AT KOPERASI UNIT DESA (KUD) SARWA MUKTI CISARUA WEST BANDUNG

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ABSTRACT

Koperasi Unit Desa (KUD) Sarwa Mukti is the primary cooperatives in Cisarua West Bandung Regency engaged in business management of dairy milk. One of the important unit in KUD Sarwa Mukti is animal health unit because nearly all the members of a cooperative made up of dairy farmers, so that the needs of cooperative members against very high diary cattle health. Currently there are problems that occur on the animal health section management of knowledge is not good so as to seek the knowledge required would take a long time. This has resulted in new officers is difficult to adapt in his work, for it required a container of knowledge management by implementing a knowledge management system.

Based on existing problems, then needed a system to manage the knowledge so that the knowledge can be stored properly. Knowlede management system built implementing expert system using CBR (Case Based Reasoning) to find the best solution to solve a problem based on dairy cattle disease case.

Based on the results of the study and after he did testing using blackbox testing methods and beta systems has been created, it can be noted that the system can help the animal health workers in the management of knowledge and handling of the problems of being conscientious dairy disease based on the existing illnesses.

***Keywords**:* KUD Sarwa Mukti, *Knowledge Management Sytem, knowledge, Animal health*

INTRODUCTION

Koperasi Unit Desa (KUD) Sarwa Mukti is a primary cooperative in Cisarua, West Bandung Regency engaged in management business of dairy milk. The cooperative was established since 1974 and now has 42 employess and 300 members of dairy farmer. The working system of KUD Sarwa Mukti was consists of a general section, finance section, logistic section, vehicle section, marketing section and animal health section (Keswan). One of section which has an important role for business activity of KUD Sarwa Mukti is animal health section because almost all members of KUD Sarwa Mukti is a dairy farmer. So that, needs of cooperative member against of the animal health is very high. The animal health section has three ministry categories, that are artificial insemination (IB), treatment and desease control.

Based on the results of the interview with Mr. Sukirman as animal health officials recognised that there are currently process guidance or referral activities against the new officers as well as the training activities organized by the Government or the private sector, but in reality the process of referral and guidance implementation not optimal due to the knowledge that will be given on knowledge workplace structures, documents results of the training and knowledge of the health of the world's dairy cows are not managed properly so that the resulting knowledge is sometimes given does not match the structure of the work because granting of knowledge be oral only, this has resulted in new officers is difficult to adapt in his work. Knowledge is an asset which should be kept by the organization, here is animal health section of KUD Sarwa Mukti but in fact is not managed properly, this will cause the existing knowledge on each officer will be carried by the officers lost when out of work, so as to result in the officer's difficult search for knowledge is needed and will certainly take a long time to find it.

The lack of utilization of knowledge sharing done by officers due to the availability of the means yet to facilitate communication and exchange of ideas which belonged to the officer, the officer causing difficulty in finding a solution to the cases of the animal disease that occurs in dairy cattle. This resulted in handling dairy cattle sometimes goes wrong.

Based on problems that have been presented then it can be inferred that knowledge are an important asset for the animal health Section of KUD Sarwa Mukti. The development of an organization of knowledge possessed by his officers. Therefore needed a knowledge management information system that can facilitate the animal health officers do the spread of knowledge and ease in searching the best solutions in accordance with the Act of facing problems implementing a knowledge Management System in the animal health section.

2. RESEARCH CONTENT

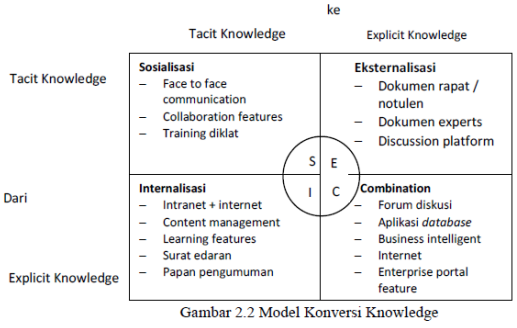
2.1 Definition of Knowledge Management

The following are some definition of knowledge management:

1. Tobing explained that [1] KM is a systematic approach that helps the world of information and knowledge to the right people at the right time to create value.
2. According to Ichijo and Nonaka [3] KM is a management strategy on the management of assets and tend to focus to the creation and sharing of knowledge.
3. KM is a way, how organizations manage their employees, identifying knowledge,save and share it to the team, improve the quality and value of the knowledge toknowledge-based innovation enghasilkan [3]. And what is meant by the description is data and information.
4. 3. Based on the definition of the Turbans and Volonino [7] explained that KM as a process in identifying, selecting, organizing, disseminating vital information and expertise that is part of the knowledge of the Organization and is usually located in the Organization are not limited to structured. KM can encourage learning in organizations that can lead to the creation of knowledge further.

2.2 The Process of Knowledge Creation

According to Nonaka, and Ichijo [3] an organization cannot create knowledge myself, having to deploy a tacit knowledge and accumulate ranging from the level of the individual. The deployment of the tacit knowledge is strengthened by the name knowledge spiral, where this is an interaction between the tacit knowledge with explicit knowledge. According to Setiarso, Triyono and Subagyo [6] stated that the process of the creation of the knowledge of the company occurs due to the interaction between the tacit knowledge with explicit knowledge, through a process of socialization, externalization, combination, and internalization property of Nonaka. New knowledge as a result of the process of the SECI would undergo multiplication a value on an ongoing basis, and this process is called knowledge spiral or knowledge conversion using the technology on the company.



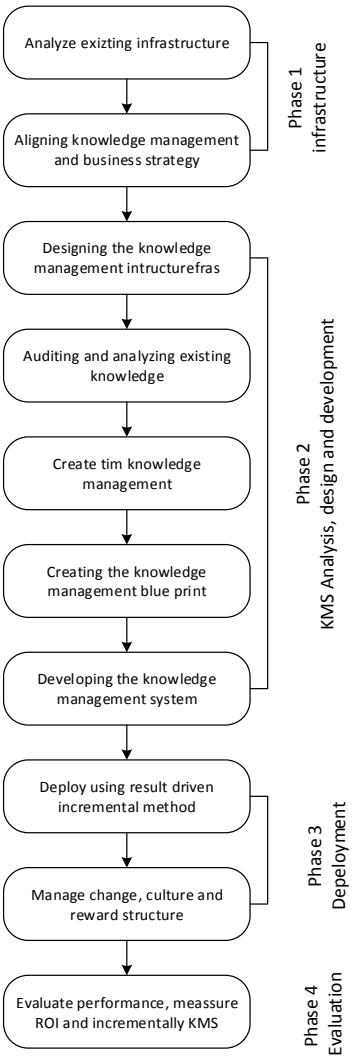
Gambar 2.2 Model Konversi Knowledge

Sumber: Setiarso, Harjanto, Triyono & Subagyo (2009: 35)

Picture 1 Knowledge Convertion [6]

2.3 The 10 *Step Knowledge Management Roadmap*

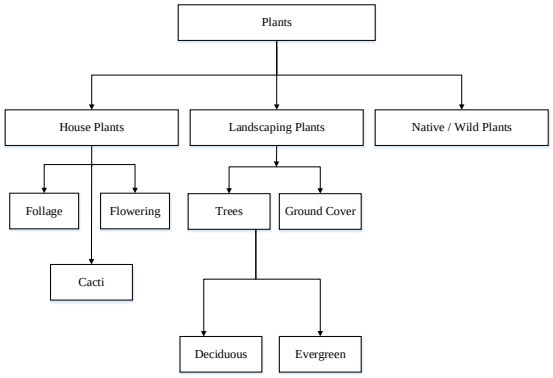
Knowledge Management is an activity in the knowledge management. Tiwana [2] describes that in formulating a conceptual framework as well as a framework for the application of knowledge management in public companies it takes 10 steps map travel from the application of knowledge management. 10 steps that includes identification of the knowledge of the Organization, what it takes to design, develop and organize an integrated knowledge management system with business strategy above the existing infrastructure capabilities, select and perform cultural and organizational changes that make knowledge management to function properly in an organization, as well as evaluate the effectiveness of the role of knowledge management and the application of his contributions against the return of investment (ROI) of an enterprise [2]. The following figure 10 stepknowledge management roadmap can be seen in picture 2.



Picture 2 10 Step Knowledge Roadmap [2]

2.4 Knowledge Taxonomy

Knowledge taxonomy is as the building of a knowledge and expertise. Taxonomy is a classification scheme a group intertwined together, often named as a type of concept relationships to one another and give the notion of categories in General compared to the sample or special case. Taxonomy can be defined also as the Basic applications or systems that are useful for exposing the concepts in the form of a hierarchical model. The higher pair has a concept, then the more common and can be dirincikan. Vice versa, the lower a concept, then the more specific name of a subclass. Important concepts which underline takxonomi sends is the notion of the derivative. Each node is a sub group of the class it, it means that the higher the knot will be on the move from parent to child classes. Examples of knwoledge taxonomy can be seen in Picture 3 [5]



Picture 2 The Example of Knowledge Taxonomy

2.5 Case Based Reasoning

Case-Based Reasoning (CBR) is a method to resolve the problem with remembering the events of the same/similar (similar) ever happened early on and then use the knowledge/information to resolve the problem, or otherwise resolve problems with adapting the solutions that have been used in the past. According to Aamodt and Plaza (1994) Case-Based Reasoning is an approach to solve a problem (problem solving) based on the solutions of the problems earlier. Meode case based reasoning consists of 4 stages, are retrieve, reuse, and retain the revised.

1. Retrive is take problems or cases that are most similar.
2. Reuse is reuse problems or cases to try to solve a problem or case.
3. The revised merefisi IE proposed solutions if in need.
4. Retain namely maintaining or storing the new solutions as part of the problem or a new case. [13]

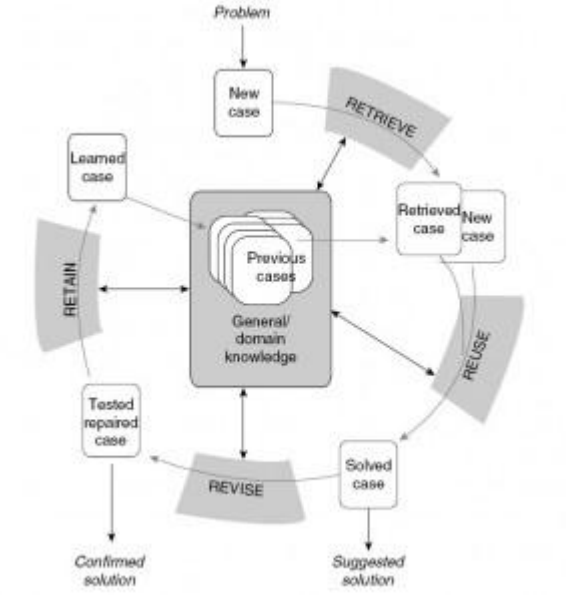
Symptoms or cause factor on the case has a value. Important symptoms has value 3 and the usual symptoms has a value of 1. The equation to calculate the rate of new cases similaritas against the old formula can be seen in equations (1)

Simililarity (*problem*,*case*)

$$\frac{[(S_1 * W_1) + (S_2 * W_2) + (S_3 * W_3) + \cdots + (S_n * W_n)]}{W_1 + W_2 + W_3 + \cdots + W_n}$$

Remarks on the equation above is S as similaritas have the same value and different similaritas has the value 0, the W as a weight (the weight given).

The cycle of case based reasoning contained in Figure 4 where has 4 stages described previously.



Picture 3 Cycle of Case Based Reasoning [13]

2.6 Analysis Of The Alignment Of Business Strategy With KMS

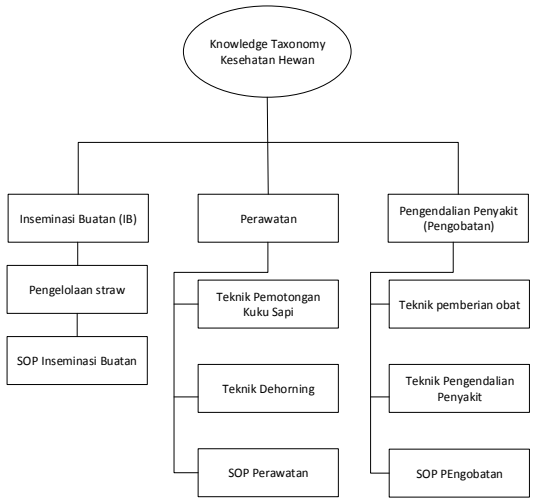
The alignment of the strategy that exists in animal health Section of KUD Sarwa Mukti can be seen in table 1.

Tabel 1 The Alignment Of Business Strategy With KMS

Strategi	*knowledge management system*
1. Menerapkan manajamen pengetahuan 2. Menyediakan sarana dan wadah sharing pengetahuan 3. Menjaga dan meningkatkan pengetahuan sumber daya manusia yang ada semaksimal mungkin 4. Meningkatkan pendidikan petugas kesehatan hewan	1. Membuat sebuah wadah atau dengan menerapkan sistem informasi yang mendokumentasikan pengetahuan seperti SOP, histori penanganan, dan pengetahuan yang berkaitan dengan kesehatan hewan sapi perah sehingga memudahkan akses pengetahuan tersebut 2. Menerapkan sarana *sharing* pengetahuan untuk meningkatkan sumber daya manusia yang optimal yaitu dengan menerapkan fitur forum serta pencarian solusi terhadap kasus penanganan hewan sapi perah

2.7 Analysis of *Knowledge Taxonomy*

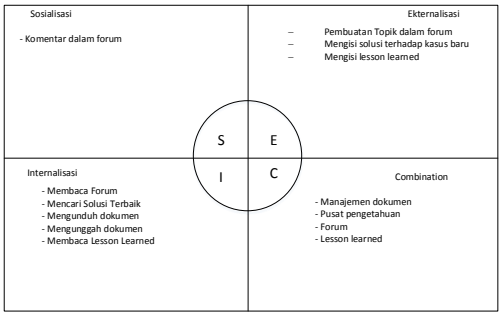
The procedure was performed to analyze the knowledge that is in the animal health Section of KUD Sarwa Mukti that is by mapping the knowledge into knowledge taxonomy, so any knowledge can be known in animal health section. Knowledge taxonomy can be seen in Picture 5



Gambar 4 *Knowledge Taxonomy* of Animal Health Section of KUD Sarwa Mukti

2.8 Analysis of the adjustment of the SECI Model KM

Adjustment feature with SECI model. Adjustment feature with SECI model knowledege management system can be seen in Picture 6.

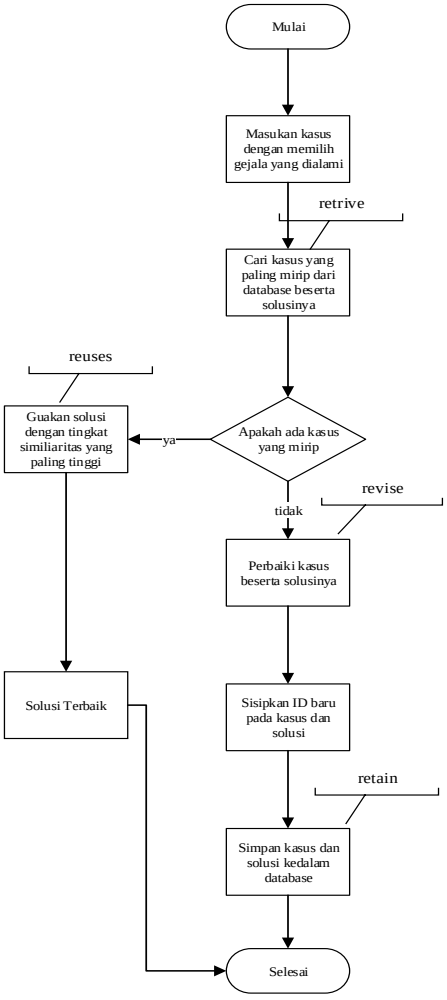


Picture 5 Adjustment KM With SECI Model

The adjustment features of the knowledge management system into four models of socialization, namely SECI externalization, combination, and internalization. In Picture 6 is described in the cell is the socialization of converting tacit knowledge into tacit knowledge is use of comments in the forum. Then in the externalisasi cells are converting tacit knowledge into explicit knowledge, namely the use of the forum, namely to make the topic as well as on the Knowledge Center renders the new solutions and new case against disease. Then, in cell internalization is converting explicit knowledge into tacit knowledge that is the use of the document management features of download and upload documents, the search for the best solution, look at the forum. Then the last one, the combination of explicit knowledge is converting into explicit knowledge, namely the use of document management, knowledge centre, lesson learned and forum.

2.9 Analysis of Case Based Reasoning Method

The system to be built is a knowledge management system which is accessed via the web that in his case based reasoning method implemented to look for the best solution in the case of animal health. CBR grooves can be seen in picture 7



Picture 6 Case Based Reasoning Groove

2.9.1 Analysis of Diseases and Symptoms

In determining the best solution against animal diseases dairy cattle weights given must be correct because it will affect the value of the similiaritas the best solution. Table analysis of disease can be seen in table 2

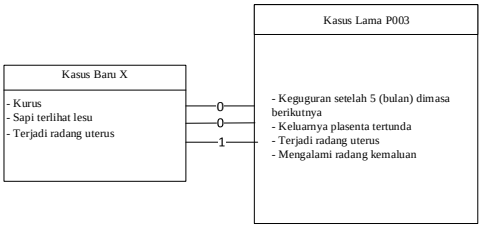
Tabel 2 Analysis of Diseases and Symptoms

Kode Penyakit	keterangan		
P001	Nama Penyakit	*SeptichaemiaEpizooticae (Penyakit Ngorok)*	
	Gejala yang dialami	Suhu badan (+40- 41 derajat Celcius), Nafsu makan turun, Pernapasan cepat, Hidung mengeluarkan cairan, Hewan ngorok	Bobot 3 1 3 1 5
	Solusi	Pengobatan : a. Streptomycine + 10-20 mg/kg B.B.I.M b. Tetracycline + 4 mg/kg B.B.I.M c. Chloram phenicol + 4 mg/kg B.B.I.M d. Serum anti. Pencegahan : Dengan vaksinasi S.E	
P002	Nama Penyakit	Antraks	
	Gejala yang dialami	Nafsu makan turun Pernapasan cepat Denyut jantung tidak stabil Suhu badan >40 derajat celcius Keluar darah dari seluruh tubuh setelah mati	Bobot 5 1 3 5 1
	Solusi	Pengobatan : a. Streptomycine + 8-10 gr tiap 2 hari b. Anti Antrax serum 100-250 ml/hari Pencegahan : a. Menjaga kebersihan kandang b. Menjauhkan ternak yang sakit dengan hewan ternak yang sehat	
P003	Nama Penyakit	*Brucellosis*	
	Gejala yang dialami	Keguguran setelah 5 (bulan) dimasa berikutnya Keluarnya plasenta tertunda Terjadi radang uterus Mengalami radang kemaluan	Bobot 1 3 3 5
	Solusi	Pengobatan : a. Streptomycine + 10-20 mg/kg B.B.I.M b. Chlor tetracyclin Pencegahan : a. Menjaga kebersihan kandang b. Vaksinasi c. Menghilangkan sumber penyakit	

2.9.2 *Retrive*

Retrive process is a process of searching new cases with similarities of old cases. A search of similarities between new cases with old cases done by the symptoms match the right inputed by the user by selecting some of the symptoms that are experienced in farm animals with symptoms in the knowledge base. At the beginning of the process of diagnosis users will menginputkan the symptoms through the combobox that symptoms have criteria and checkboxes on the system. If 0, there is no similar symptoms, if 1 there is the same symptoms, using the formula S = similarity (similarity) is 1 (same) and 0 (beda), W = weight (weight given), the weighting parameters (w): symptoms of Important = 5, the symptoms are the usual Symptoms = 3, = 1

Kasus Baru X
G015 - Kurus G017 - Sapi terlihat lesu G013 – Terjadi radang uterus



Picture 7 Comparison of new cases by Case P003

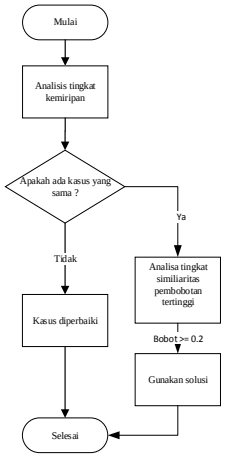
Similarity (X, P003)

$$\frac{(0*1)+(0*3)+(1*3)+(0*5)}{1+3+3+5}=\frac{3}{12}=0{,}25$$

Conclusion : a comparison with the case of P003 found matches with new case

2.9.3 *Reuse*

The calculation of similiaritas with weights then the case of the example the new cases did not have similarities with the case for long. Reuse process in the cycle of CBR is the responsibility in providing solutions from a new case based on settlements the case taken back i.e. the results of the calculation of the level of similiaritas of the most high. The example case above has no similarity to P001 and P002 but have similarities with the case of P003 thus P003 taken as solutions to new cases of the disease are being sought with the percentage of ≥ 20%.



Gambar 8 Reuse Process Groove

2.9.4 *Revise*

The revised process is a process of review cases and solutions are given if the process of retrieve and reuse systems can only find a case of there is no automated solution 0.1 then in the example above the case formed a revision ID which is accommodated in a special table (table of the revised) which will then be evaluated by the head as experts to find the right solution. The flow of the revised stage can be seen in Picture 10



Picture 9 Revise Process Groove

2.9.5 *Retain*

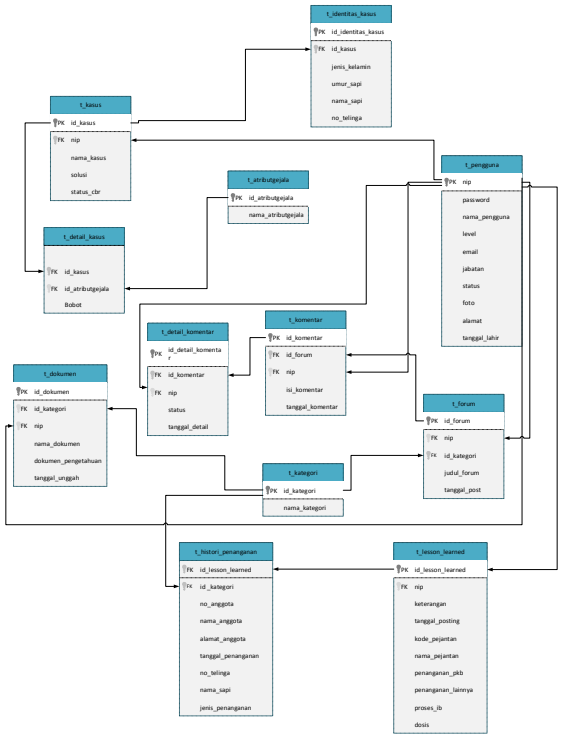
The process retain repaired solution at the stage of the revised data is stored as knowledge. If the head of the new case stated case as valid then new cases can be refurbished into a base case. The grooves retain phase can be seen in Picture 11



Picture 10 Retain Process Groove

2.10 Perancangan Data

Following are the results of the design data on the knowledge management system that will be built in Picture12



Gambar 11 Diagram Of Relation Knowledge Management System Of Animal Health Section of KUD Sarwa Mukti

2.11 Interface Implementation

Implementation of the interface contains the exposure each displaying knowledge management system of animal health section of KUD Sarwa Mukti built each interface are distinguished based on the access rights that comprise the admin interface, the interface is the interface, and the head of the officer.

1. Admin Interface

Tabel 3 Admin Interface

No	Menu	Deskripsi
1	Login	Digunakan sebagai halaman login administrator
2	Halaman utama admin	Halaman yang digunakan sebagai halaman utama administrator
3	Pengelolaan Data Master pengguna	Halaman yang digunakan untuk mengelola data pengguna
4	Penyajian profil	Halaman yang digunakan untuk melihat profil pengguna

2. Head Interface

Tabel 4 Head Interface

No	Halaman	Deskripsi
1	Login	Digunakan sebagai halaman login kepala
2	Halaman utama kepala	Halaman yang digunakan sebagai halaman utama administrator
3	profil	Digunakan untuk melihat profil
4	Pengelolaan data master kategori	Digunakan untuk melakukan pengelolaan data kategori
5	Pengelolaan data master gejala	Digunakan untuk pengelolaan data atribut gejala
6	Pengelolaan data master penyakit	Digunakan untuk melakukan pengelolaan data penyakit
7	Penyajian dokumen	Digunakan untuk melihat data dokumen
8	Penyajian lesson learned	Digunakan untuk melihat data lesson learned
9	Penyajian forum	Digunakan untuk melihat forum
10	pengelolaan analisa kasus	Digunakan untuk melakukan diagnose penyakit
11	penyajian daftar revisi	Digunakan untuk melihat data revisi

3. Antarmuka petugas

Tabel 5 Interface The Officer

No	Halaman	Deskripsi
1	Login	Digunakan sebagai halaman login kepala
2	Halaman utama kepala	Halaman yang digunakan sebagai halaman utama administrator
3	profil	Digunakan untuk melihat profil
4	Penyajian dokumen	Digunakan untuk melihat data dokumen
5	Penyajian lesson learned	Digunakan untuk melihat data lesson learned
6	Penyajian forum	Digunakan untuk melihat forum
7	pengelolaan analisa kasus	Digunakan untuk melakukan diagnose penyakit

2.12 Testing

Software testing is the stage to find mistakes and flaws in software that is built so that it can be known whether the software meets the criteria in accordance with purpose or not. As for the testing method used in this system is a black box testing methods. Black box testing has a focus on the functional requirements of the software. Black box testing method consists of two stages of testing, i.e. testing and blackbox beta stages.

2.12.1 Blackbox testing conclusions

Based on the results of testing the blackbox has been done can be drawn the conclusion that the application is already running quite a maximum, but does not cover the possibility of errors can occur at the time the application is used, thus requiring more maintenance process to find out the deficiencies of the application.

1) if the data entered is correct, then the system will release information in accordance with expectations.
2) if the data entered does not correspond to the system, then the system will show the error message correspond to faults. So when entering the data has to be in accordance with the rules contained in the system, so that a functional system can release the results accordingly.2.12.2 Kesimpulan pengujian beta

Based on the results of the interview with the head of the Department of animal health workers and can be concluded that this system is functionally can already produce the expected output that is able to assist officers in documentation, distribution, utilization of knowledge. Help in the search for solutions to problems faced by the officers as well as it is in terms of discussing or searching solutions with intelligent systems.

3 CLOSING

3.1 Conclusion

Based on the results obtained from the making of the final project, the conclusion can be drawn as follows:

1. Knowledge management system built is already helping the officers in the management of knowledge such as SOP, training results, as well as the experience of other officers owned.
2. Knowledge management system built is already helping in the search for the best solution of the problem of handling the health of dairy cattle.

3.2 Suggestions

In order for the system to be built can work even better, should do the following:

1. Knowledge management system is need for the development of such a reward to the officers who often do sharing knowledge so that the officers would be more motivated in the knowledge sharing activities.
2. The need for the expansion of the best solution to search all fields in animal health section such as the field of artificial insemination

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