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The Knowledge Management System of A State Loss Settlement

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Abstract

The knowledge management is a model involving the information system in the knowledge processing. "Tim Penyelesaian Kerugian Negara" (TPKN) is one of sources of information related to the state loss settlement, so it needs the development of knowledge management system on the state loss settlement to ease the users when looking for the references of knowledge as completely as possible, accurately, and quickly. This research aims to develop the system of knowledge management on the state loss in LAPAN (SIMAPKLA). The used research methodology is Knowledge Management System Life Cycle (KMSLC). The tacit, explicit knowledge is taken from the experts and it is stored in the Knowledge Base (KB). The design model uses the approach with the orientation of object and implementation with Yii Framework and blackbox testing. The menu on this system includes home, about us, dictionary, news, meeting schedulles, knowledge about state loss, e-document, progress, forum, and contact us. Based on a series of tests, in the aspect of functionality, this system is suitable and useful to share knowledge and know the development of state loss settlement.

Keywords*: Tim penyelesaian kerugian negara (TPKN), knowledge management system life cycle (KMSLC), knowledge management system on state loss in LAPAN (SIMAPKLA)*

1. Introduction

The management of state finance is one of important factors in 1945 Constitution since reformation on the management of state finance becomes the basic of its process in an orderly manner, transparently, and accountably. The reformation on the management of state finance in law is marked with 3 (three) packages of Laws about State Finance, namely Law No. 17 Year 2003 about State Finance [1], Law No. 1 Year 2004 about State Treasury [2], and Law No. 15 Year 2004 about Examination of Management and Responsibility of State Finance [3]. In the management of state finance, one of important factors regulated in those three packages of laws about the state finance are related to the state loss settlement.

Lembaga Penerbangan dan Antariksa Nasional (LAPAN) is the Non-Ministry Government Institution under the President with the responsibility toward President through Minister handling the Science and Technology sectors [4]. In this case, the institution has one of functions as organizer and guidance of general administration service. State Losses Settlement Team of LAPAN is the team formed based on the decision from chairman of LAPAN with the role to implement the management process of demand of treasury and compensation on the state loss in LAPAN based on the finding of Badan Pemeriksa Keuangan (BPK), Inspektorat of LAPAN, and report of work unit [5].

The state loss is viewed from the executors, namely treasurer, non-treasurer civil servants, and third party [6]. There is a tendency of increasing number of cases and state loss, but the state loss settlement decreases. According to Report of Monitoring on State Loss Settlement until Semester II of 2013 on LAPAN, no. 282/HP/XVI/12/2013 on 30 December 2013, there were 97 cases with the value of IDR3.52 billion, US$942.95 thousand, ¥237.18 million, EUR4.67 million; AUD306.10 thousand. Until Semester II of 2013, LAPAN paid IDR52.20 million and solved 13 cases of state loss with the value of IDR387.22 million. Thus,

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there are still 84 cases of state loss that must be solved with the value of IDR3.08 billion, US$942.95 thousand, ¥237.18 million, EUR4.67 million; AUD306.10 thousand.

The problems of state loss management in LAPAN are (1) the need to improve Guidance of State Loss Settlement in LAPAN as regulated in Decree of LAPAN No: Kep/190/X/2004 that is not relevant anymore with the development of regulation and legislation, 2) the importance of understanding on the state loss settlement in every work unit, (3) the transfer of human resource as the management of state loss cases that is not followed by the transfer of knowledge, (4) Few source documents that hamper the state loss settlement, (5) difficulty in knowing the stages of every case of state loss.

Based on the aforementioned problem, it needs SIMAPKLA that is interaction of technology and mechanism to support the process of knowledge management [7]. Web based application using the Knowledge Management System and utilize the current technology, so that any data, information and knowldege could be processed accurately and quickly accessible [8], and SIMAPKLA using it.

The previous research related to the development is to plan Knowledge Management System for the Integrated One-Stop Licensing Service, in order to anticipate several problems in the interaction of work, problem solution, including the loss of tacit, explicit knowledge from the employees of Integrated One-Stop Licensing Service (PPTSP) due to the rotation and mutation in the development of career for the employees [9]. Besides, other researches develop the system of knowledge management in the choosing of seed and high-yielding varieties of rice in which farmers, people, organization, and experts can easily and quickly get the knowledge about the seed and variety of rice as well as the consultation with model of linear cycle of Giarrantano and Rilley [10]. Moreover, the research is about planning an application of knowledge management as the media to document the knowledge and facility to support a culture of knowledge sharing in the subdivision of Oracle Financial in Orang Tua Group [11]. Knowledge can use to get form solution for the ultimate question [12]. The difference from the previous researches is the used method in developing the Knowledge Management System and the taken object and case study. The system to develop is based on information and monitoring on every case of state loss.

SIMAPKLA is expected as the Work Unit media (chairman of work unit, officials making the commitment, provider team of goods and service), TPKN, and internal auditor of LAPAN to share knowledge about state loss. Besides, SIMAPKLA is useful to track the development of state loss settlement.

2. Research Method

The used methodology in planning SIMAPKLA is with Knowledge Management System Development Life Cycle [13] as seen in Figure 1.

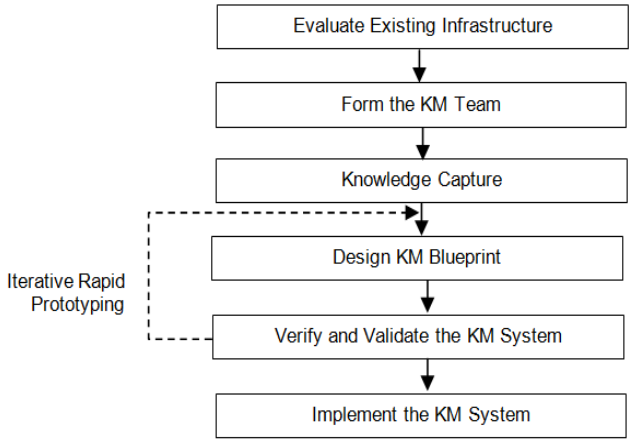

Figure 1. Stages of KMSLC

The stages of this research include the evaluate existing infrastructure, form the KM team, knowledge capture, design KMS blueprint, verify and validate the KM system, implement KM system, and testing KM system.

Evaluate existing infrastructure by learning the on-going system is done until the condition of current can be known. Analyzing the infrastructure of LAPAN, analyzing system related to infrastructure, reviewing document, observation, and interview. The analyzed infrastructure in this research is about the analysis of technological infrastructure from hardware, software, and human resource. A stage of form the KM team is done with the purpose to build the knowledge management system.

In the stage of knowledge capture [14], the knowledge is categorized into as follows:

a) Explicit knowledge is from several media related to the state loss settlement in LAPAN (documents of Report of Examination from BPK, Inspektorat of LAPAN, Follow-up Observation of Compensation, Follow-up Observation on Report of Examination of BPK, TPKN Report, and legislation.
b) The tacit knowledge is from the experts related to the state loss settlement from the State Losses Settlement Team of LAPAN including Biro Umum, Inspektorat, and Biro Renor.
c) Knowledge Developer gets the knowledge from the experts and it is used to develop the knowledge base that will be used in searching the knowledge.

The stage of design KM blueprint uses the object-oriented approach with UML [15]. It is categorized based on the system behaviour including use case diagram for every doer, the planning of database with Entity Relationship Diagram (ERD) and interface including menu, sketch, and display. In the stage of verify KM system, the program is verified whether the knowledge related to the state loss settlement is true or not. The outcome of knowledge is checked to know whether it is true or not. The validation of system is done to ensure that the system is based on need and demand of users.

The implementation stage is implemented with Yii Framework and MySQL database. The system checking uses the blackbox [16]. The testing process is conducted with a series of test cases to know the system functionality.

3. Result and Analysis

Based on the stages in the previous chapters, the results of every stage are as follows:

3.1. Evaluate Existing Infrastructure

In this stage, the discussion is the evaluation on the infrastructure availability in terms of technology, including software, hardware, and human resource. The evaluation on infrastructure availability in terms of technology is implemented by doing interview with Sub-division Pemasyarakatan dan Sarana Informasi Kedirgantaraan (PSIK) of Biro Kerjasama dan Humas (KSH) from LAPAN Topology of Central LAPAN network in Rawamangun is shown in Figure 2 and that of LAPAN network is in Figure 3.

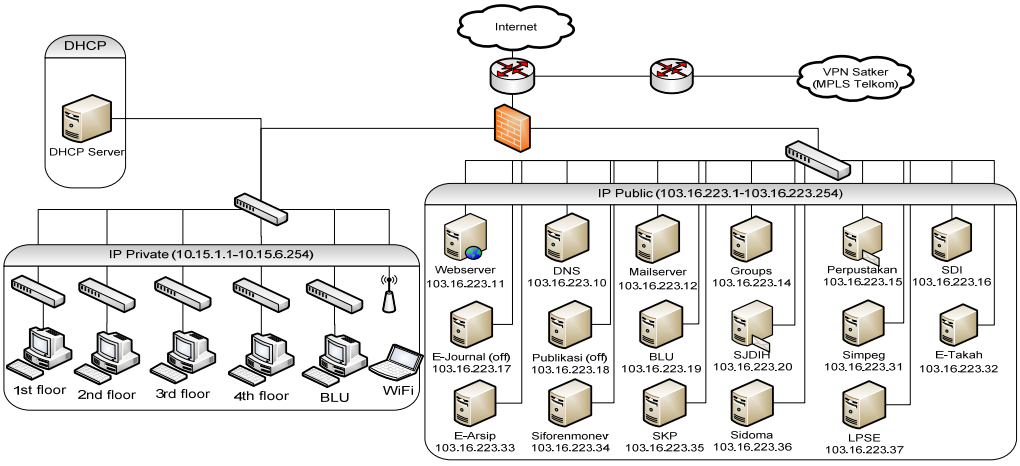

Figure 2. Topology of Central LAPAN Netwok - Rawamangun

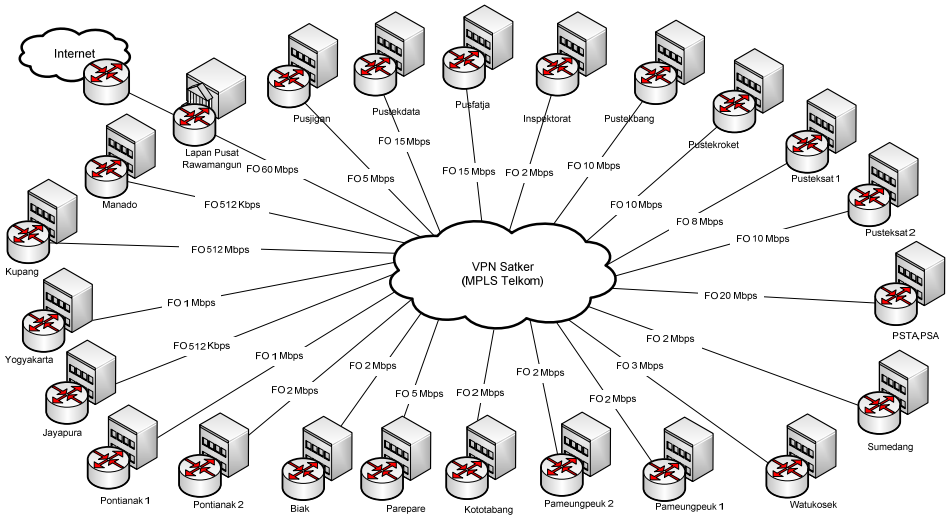

Figure 3. Topology of LAPAN Network

The network infrastructures of LAPAN are:

a) Firewall, switch, and Wi-Fi;
b) In the central office of LAPAN, the connecting media of every core switch to distribution switch with FO, from the distribution switch to user with UTP cable and wireless.

3.2. Form the KM Team

The team is formed to build the knowledge management system of state loss settlement from the people directly and indirectly involved in the building of system, namely:

a) The Project Manager has the role as the responsible person in the development of knowledge management system for state loss settlement.
b) The source of knowledge has the role as the experts in their own field in building a Knowledge Base;
c) The data collector has the role to collect data/document related to the state loss;
d) The system analyst has the role to plan the development of knowledge management system of state loss settlement in which the plan will be used as the reference by the programmer for the implementation;
e) The programmer has the role to manage the coding from the result of System Analyst planning.

3.3. Knowledge Capture

The knowledge exchange is only when during the case of state loss. When there is a case of state loss, the users ask questions via email or phone to State Losses Settlement Team of LAPAN and the solution on the problem is searched. Then, the meeting is conducted to discuss the case after the case is given to State Losses Settlement Team of LAPAN. There is no online media to exchange the knowledge related to the state loss settlement that can be used as the learning media of work unit about the state loss settlement and to understand the development of the settlement in every Work Unit in LAPAN. Besides, there is no document storage (repository) in LAPAN related to the state loss, so it will be difficult to know the state loss and its development. So, it needs the storage into a knowledge base that can be used to help users know the knowledge base about the state loss and its development.

With the Knowledge Management System of State Loss Settlement, it is expected to support the process of knowledge sharing related to the state loss settlement more effectively, so Work Unit can learn to handle every case of state loss. Work Unit can be more independent in solving every case of state loss with the reference on the Knowledge Base. Meanwhile, the discussion forum can facilitate the Work Unit to participate in discussing certain topic related to state loss settlement. E-document is provided to share document related to state loss. The knowledge map is in Figure 4.

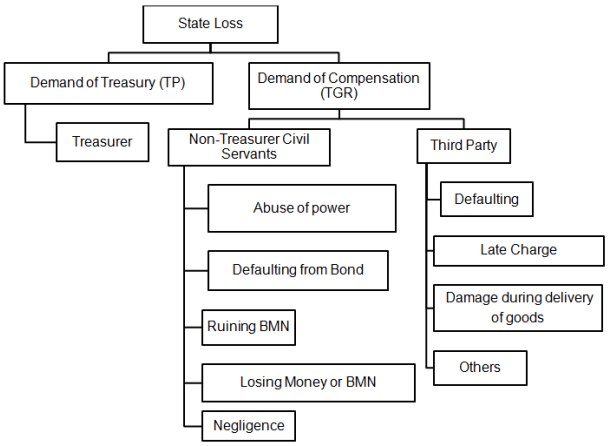

Figure 4. Knowledge Map of SIMAPKLA

3.4. Design KM Blueprint

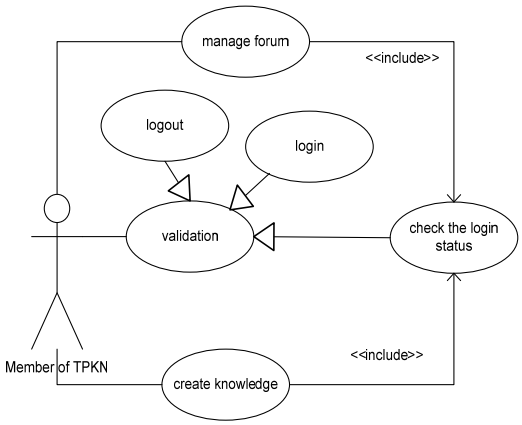

Figure 5. Use Case of Member of TPKN

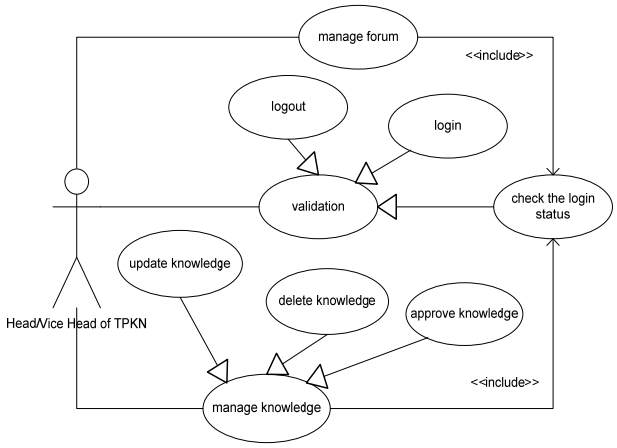

Figure 6. Use Case of Head and Vice-head of TPKN

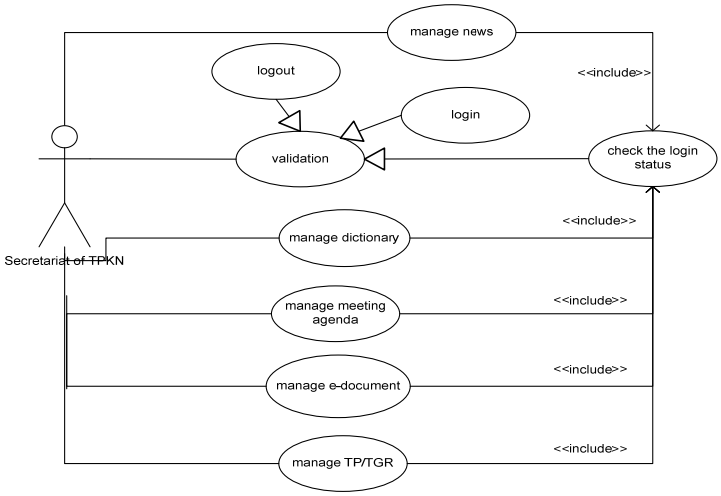

Figure 7. *Use Case* of State Losses Settlement Team Secretary

In this stage, Use Case Diagram functions to describe the built system behaviour. Use case on SIMAPKLA is shown in Figure 5, 6, and 7 including the actors as the visitor of the system (Work Unit in LAPAN with limited access to search, download document, and ask the questions related to the state loss, admin as the IT staff in TPKN-LAPAN with the role to manage system, secretariat of TPKN-LAPAN with the role to manage dictionary, news, meeting agenda, e-document, TP/TGR, members of TPKN-LAPAN with the role to enter the knowledge related to the state loss and answer the question from every users, and head and vice-head of TPKN-LAPAN with the highest access to edit the knowledge on state loss and agreement on the knowledge from members of TPKN and use case including the management of home, profile, dictionary, knowledge of state loss, news, validation, meeting agenda, e-document, forum, TP/TGR, contact and admin.

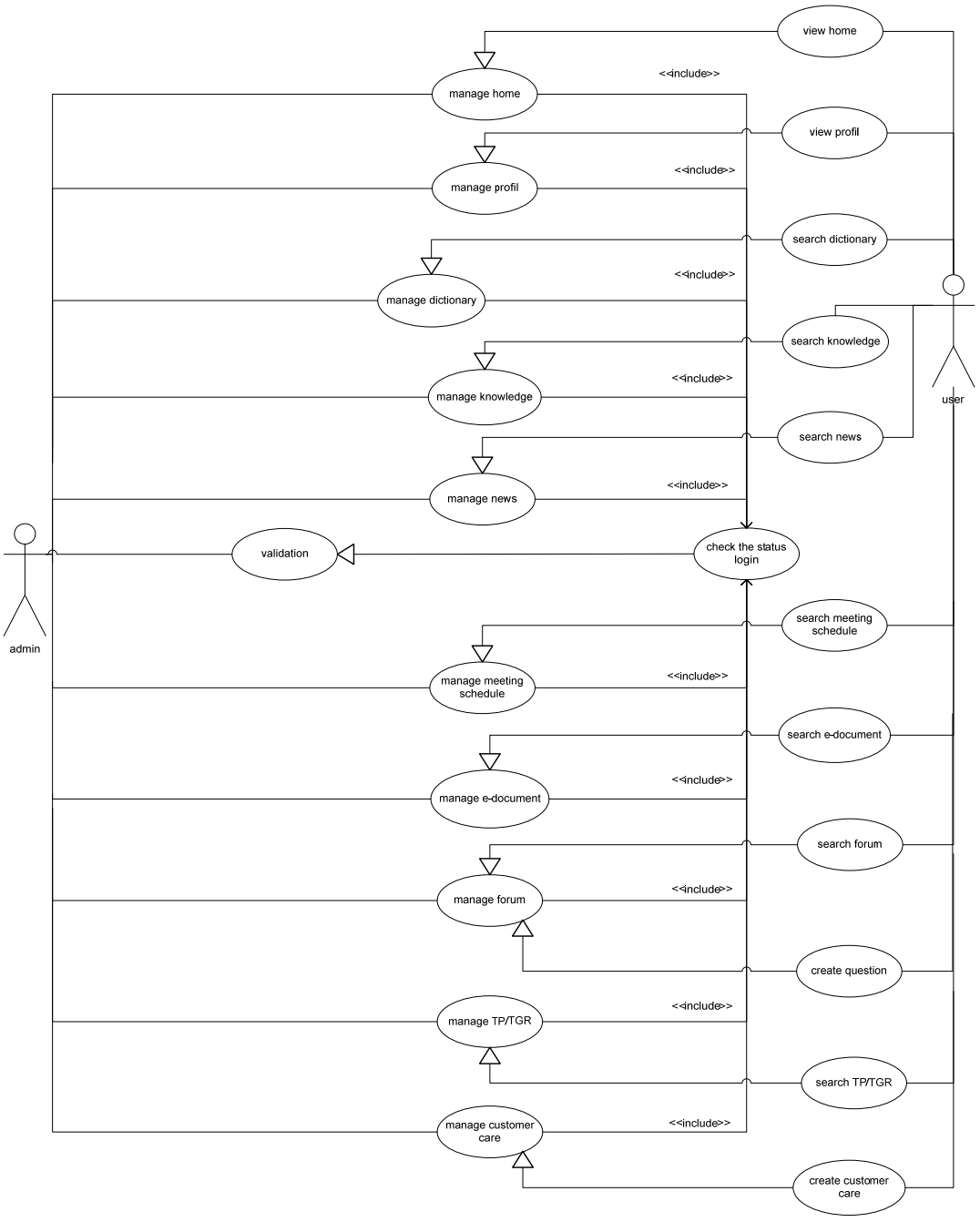

Figure 8. Use Case of Diagram of User and Admin

In the planning of database with ERD [17]. It has sixteen entities, consist of: pegawai, level, profile, dictionary, knowledge, meetingschedule, news, edocument, debitur, loss, payment, category, thread, question_answer, customercare, and contact. ERD of SIMAPKLA is shown in Figure 9.

Figure 9. ERD of SIMAPKLA

After the database planning, it needs the interface planning. In this stage, the interface is designed with every page containing header, footer, and the centre with two parts, in which the left part is menu navigation and the left part is content describing every chosen menu, The homepage is divided into administrator page and user page. The navigation of SIMAPKLA is shown in Figure 10.

Home	About Us	Dictionary	Knowledge	News	Meeting Schedule	e-doc	Progress	Forum	Contact Us

Figure 10. Navigation of SIMAPKLA

3.5. Verify and Validate the KM System

The verification and validation on the feedback related to knowledge about the state loss is implemented in this stage. The input of knowledge is verified; it is proven that the entered knowledge is related to the state loss and the way to solve it.

3.6. Implement and testing KM System

SIMAPKLA is built from PC with the specifications as follow: Windows 7/8 as its operating system, *My Structure Query Language* (MYSQL) as the data storage media, Microsoft

Visio 2007 and Smartdraw 2013 for the phase of system design. Yii Framework is one of *frameworks* of open source *application* implementing the principles of Model View Controller (MVC) with PHP programming language and facility of Gii code generator [18]. The specifications of hardware are Intel Core i3 processor, Memory of 2048 MB, hard disk drive with the capacity of 500 GB, monitor with resolution of 1600 x 900. In the testing stage, the blackbox testing is used by testing the functionality of SIMAPKLA. Based on the testing stage, there is valid result after some test cases on administrator and user pages. SIMAPKLA is suitable with the given command in terms of its functionality.

4. Conclusion

There is no online media to exchange the knowledge related to the state loss settlement that can be used as the learning media of work unit about the state loss settlement and to understand the development of state loss settlement. So, SIMAPKLA is required. SIMAPKLA is built with KMSLC method. The tacit, explicit knowledge is taken from the experts and it is stored in the Knowledge Base (KB). The design model uses the approach with the orientation of object and implementation with yii Framework. The menu on this system includes home, about us, dictionary, news, meeting schedulles, knowledge about state loss, e-document, progress, and forum. The test is conducted by testing the functionality of system with a series of test cases. Based on the result of test, the knowledge management system of state loss is suitable with the given command in terms of functionality. So, it can be concluded that SIMAPKLA is suitable with need and has the function as the media to share knowledge on state loss and monitor the development of state loss settlement.

References

[1] Undang-Undang Republik Indonesia. Undang-Undang Republik Indonesia Nomor 17 Tahun 2003 tentang Keuangan Negara. 2003.
[2] Undang-Undang Republik Indonesia. Undang-Undang Republik Indonesia Nomor 1 Tahun 2004 tentang Perbendaharaan Negara. 2004.
[3] Undang-Undang Republik Indonesia. Undang-Undang Republik Indonesia Nomor 15 Tahun 2004 tentang Pemeriksaan Pengelolaan dan Tanggung Jawab Keuangan Negara. 2004.
[4] Peraturan Kepala Lembaga Penerbangan dan Antariksa Nasional. Peraturan Kepala Lembaga Penerbangan dan Antariksa Nasional Nomor Per/01/III/2010 tentang Rencana Strategis Lembaga Penerbangan dan Antariksa Nasional 2010-2014. 2010.
[5] Keputusan Kepala LAPAN. Keputusan Kepala LAPAN Nomor Kep/190/X/2004 tentang Petunjuk Pelaksanaan Penyelesaian Kerugian Negara di Lingkungan LAPAN. 2004.
[6] Peraturan Menteri Dalam Negeri Nomor 5 Tahun 1997 tentang Tuntutan Perbendaharaan dan Tuntutan Ganti Rugi Keuangan dan Barang Daerah.
[7] Becerra, et al. Knowledge Management System and Process. Cyrus F Gibson. United States of America: ME Sharpe, Inc. 2010: 8-9.
[8] Aulia Rahman et al. Knowledge Management System for Zakat. *TELKOMNIKA Indonesian Journal of Electrical Engineering.* 2014; 12(12): 8349-8356.
[9] Subagdja S. Perancangan KMS untuk Pelayanan Perizinan Terpadu Satu Pintu. *Konferensi Teknologi Informasi dan Komunikasi untuk Indonesia*. Bandung. 2011.
[10] Kamilah N. Sistem Manajemen Pengetahuan dalam Pemilihan Benih dan Varietas Unggul Padi. Tesis. Bogor: Sekolah Pascasarjana IPB; 2012.
[11] Gema, et al. Perancangan Prototype Aplikasi Knowledge Management pada Divisi Management Automation Information untuk Mendukung Oracle Financial pada Orang Tua Group. *Commit IT*. 2010; 4.
[12] Tan Cuiping, et al. Agricultural Knowledge Grid Construction. *TELKOMNIKA Indonesian Journal of Electrical Engineering*. 2013; 11(9): 5224-5228.
[13] Awad, Ghaziri. Knowledge Management. Upper Saddle River. NJ: Pearson Prentice Hall. 2010.
[14] Nonaka IT, Takeuchi. The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation. Oxford: Oxford University Press. 1995.
[15] Wesley. Unified Modeling Language User Guide. The 2nd ed. 2005: 496.
[16] Satzinger. System Analysis and Design in a Changing World. Fifth Edition. 2010.
[17] Chen, et al. The Entity-Relationship Model Toward a Unified View of Data. *ACM Transactions on Database Systems*. 1976; 1(1): 9-36.
[18] http://www.yiiframework.com/ *accessed on 14 Februari 2014.*