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JOURNAL OF TECH-E

| 2581-1916 (ONLINE) | 2598-7585 (PRINTED) |

Article

Design and Analysis of a Knowledge Management System for Sawit Seberang Health Center Using the Inukshuk Methodology

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SUBMISSION TRACK

Recieved: 07, 24, 2024
Final Revision: 08, 06, 2024
Available Online: 08, 08, 2024

KEYWORD

Health Center, KMS, Inukshuk, Knowledge

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A B S T R A C T

The Sawit Seberang Health Center as the technical implementation unit of the health service is responsible for carrying out health development in the Sawit Seberang area, both in terms of health services and providing health knowledge that is useful for medical personnel in particular and the community in general. The problem faced by the Community Health Center is the unavailability of a computer-based system that can be accessed online as a medium for storing and sharing knowledge and information about health, both knowledge for fellow medical personnel and knowledge for the community. This problem can be solved with the KMS application which can be accessed online. The method used is the Inukshuk KM Model Method. The Inukshuk Knowledge Management model is a framework that has been refined from the SECI model (socialization, externalization, combination and internalization) with the addition of components such as leadership, culture and technology. The relationship with Knowledge Management is that it can provide information about Tacit and Explicit Knowledge in the organization. The result of this research is the KMS Puskesmas application which can be accessed online as a medium for storing and sharing knowledge for fellow medical personnel as well as a medium for information and knowledge for the community.

I. INTRODUCTION

Knowledge is a very valuable asset for a business. The more knowledge the stakeholders of a company have, the more the company will develop. However, companies that have quality knowledge are not necessarily able to produce goods or services of similar quality [1]. For this reason, it is important for a company to have a knowledge management system or what is known as a Knowledge Management System (KMS) to be able to utilize knowledge

DOI: 10.31253/te.v8i1.3181

as fully as possible. KMS or knowledge management system can help companies share knowledge about business processes, problems that arise in each work unit, and share experiences about things outside of work which are useful for developing employee knowledge about the company [2].

Islam views science as very important. People who have knowledge of Allah SWT. Promise with a high degree in His side, let alone in the side of other humans. The importance of deepening knowledge, practicing it well, and disseminating it as stated in the Al-Quran, Surah At-Taubah: "And it is not appropriate for the believers to all go (to the battlefield). Why don't some of each group of them go to deepen their religious knowledge and to warn their people when they return, so that they can protect themselves." (Q.S. at-Taubah/9:122) [3].

The world of health is a special branch that is always experiencing changes based on learning and research related to the explosion of information. The learning outcomes are practices related to tacit knowledge and explicit knowledge obtained through active learning, internships and experience [4]. Sawit Seberang Health Center is one of the health centers in Langkat Regency. Puskesmas as the technical implementation unit of district/city services which is responsible for carrying out health development in a region has the task and function of providing good and quality health services to the community. The knowledge possessed by medical personnel at the Community Health Center, especially tacit knowledge, can be expressed explicitly so that it can be used as a learning medium for other medical personnel [5]. The problem faced by community health centers is that there is no computer-based system that can be used as a medium for storing explicit knowledge, making it difficult for medical personnel to share knowledge and information. Another problem is that tacit knowledge from medical personnel that has not been stored will be carried over by the medical personnel if there is a mutation of medical personnel. This is due to a lack of knowledge management to summarize problems that have been resolved.

Knowledge management is needed to summarize existing knowledge or newly acquired knowledge in the present, and can be utilized in the future. The definition of knowledge here is knowledge, experience, factual information and expert opinions [6]. In order to achieve strategic planning and the right balance so that this KMS application can run well, the Inukshuk KM Model method is used. The Inukshuk Knowledge Management Model not only focuses on knowledge conversion but also emphasizes aspects of leadership, technology and culture [7]. The Inukshuk Knowledge Management Model is a framework that has been refined from the SECI model (socialization, externalization, combination and internalization) with the addition of components such as leadership, culture and technology. The connection with Knowledge Management is that it can provide information about Tacit and Explicit Knowledge in the organization, clearer information about technology in the organization, then how a leader leads an organization, and knowing the culture that exists in the organization [8].

Previous research related to the application of the Inukshuk model in knowledge management was carried out by Orissa Octaria. Inukshuk's relationship with KM is that it can provide information about tacit and explicit knowledge in the organization, clearer information about the technology that exists in the organization, and how leaders lead organizational leadership and the culture that exists in the organization. In this research, Orissa Octaria only carried out Knowledge Analysis Management System using the Inukshuk Method without designing the system or building a knowledge management system application for the company. Meanwhile, in this research panel, the author will analyze and design a Knowledge Management System application to simplify and speed up the Sawit Seberang Community Health Center in creating knowledge and sharing knowledge both with

DOI: 10.31253/te.v8i1.3181

community health center employees and the community so that the distribution of knowledge is even.

II. LITERATURES REVIEW

KMS Inukshuk Method

KMS is a tool used to support a company strategy in collecting, identifying, selecting, processing and disseminating existing knowledge, both individual knowledge and internal company knowledge so that it can encourage learning and service within the organization as well as creating knowledge sharing between employees [9]. The Inukshuk KM Model is a framework that has been refined from the SECI model (Socialization, Externalization, Combination and Internalization) with the addition of components such as Leadership, culture and technology. The connection with KM is that it can provide information about tacit and explicit knowledge in the organization [10].

The Inuskhuk model consists of several stages which can be seen in Figure 1 below.

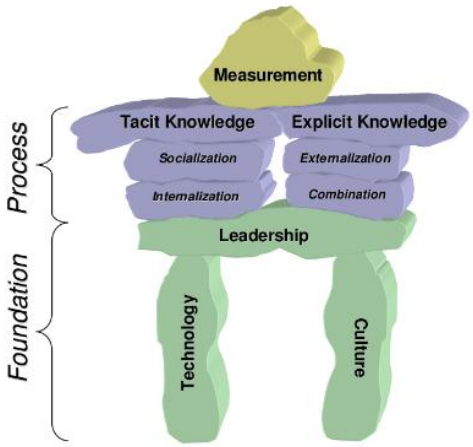

Figure 1. Inukshuk KM Model

The knowledge management process in a company can be implemented using the Inukshuk model which maps the features of the knowledge management system into 7 processes, namely [11]:

1. Socialization (Training, Meeting, Group, Chat)
2. Externalization (Create Point of meeting, Create Manual book, Create Best practice, Create Working Document, Create Open case)
3. Combination (Knowledge repositories)
4. Internalization (Read Point of meeting, Read Manual book, Read Best practice, Read Working Document, Read Open case),
5. Leadership
   a. Controlling documents and knowledge is the responsibility of the knowledge leader (editing and deleting).
   b. The leader will direct and control his subordinate employees to increase knowledge and share knowledge.
6. Culture
   The recommended culture is to make each individual aware of the implementation of the management system by providing assessment aspects including: motivation to share knowledge, communication and cooperation, and also self-development.
7. Information Technology
   The recommended technology for implementing knowledge management for this company is Network Attached Storage (NAS). NAS applications are important for

DOI: 10.31253/te.v8i1.3181

optimizing file sharing across the network. Simply put, by simply connecting devices to the network, IT departments can quickly and easily expand the network's storage capacity. The knowledge management system solution used for this company case study is FreeNAS.

III. FRAMEWORK

The systems thinking framework can be described as follows.

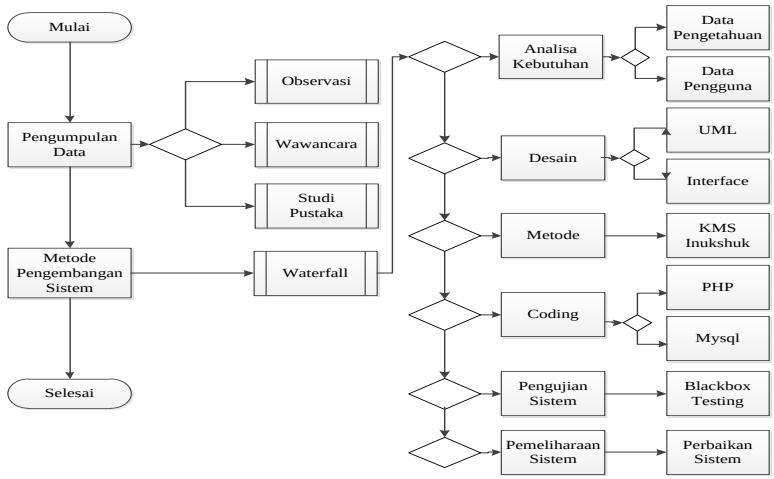

Figure 2. Thinking Framework

System Flowchart

The system flowchart consists of a backend and frontend flowchart as in the following image.

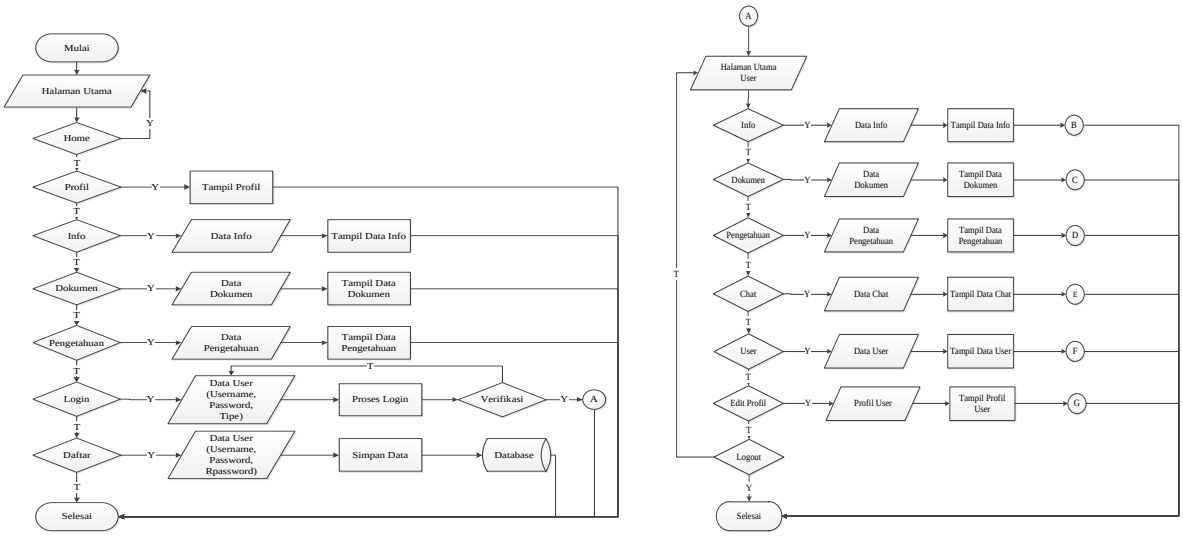

Figure 3. (a) Front End System Flowchart (b) Back End System Flowchart

IV. METHODS

In this research, the research method used is a qualitative method. The qualitative method is a process carried out to gain knowledge by using the data we have to find out information that we want to know [12].

Data Collection Technique

DOI: 10.31253/te.v8i1.3181

Field Study Conducting direct studies in the field to collect data, namely direct inspection of the research location, namely at the Sawit Seberang Langkat Community Health Center UPT. The data collection techniques used by the author are:

a. Observation, namely by making direct observations at the Sawit Seberang Langkat Community Health Center UPT which is located at Jl. Besar Sawit Seberang, Sawit Seberang, Kec. Sawit Seberang, Langkat Regency, North Sumatra, 20852.
b. Direct face-to-face interviews with the parties concerned to obtain explanations of problems that were previously unclear, namely regarding the system mechanisms used at the health center, health information and health knowledge to Ka. UPT Sawit Seberang Health Center, to be precise, Mrs. Hj. Erlina, SKM, MKM. This is to ensure that the data obtained is truly accurate.
c. Literature Study (Library Research) The author conducted a literature study to obtain data related to writing a thesis from various reading sources such as guidebooks for creating PHP applications, data management, and books or journals that discuss the concept of designing knowledge management systems (KMS) in health institutions [13].

System Development Methodology

The system development carried out in this research uses the waterfall method which can be described as follows.

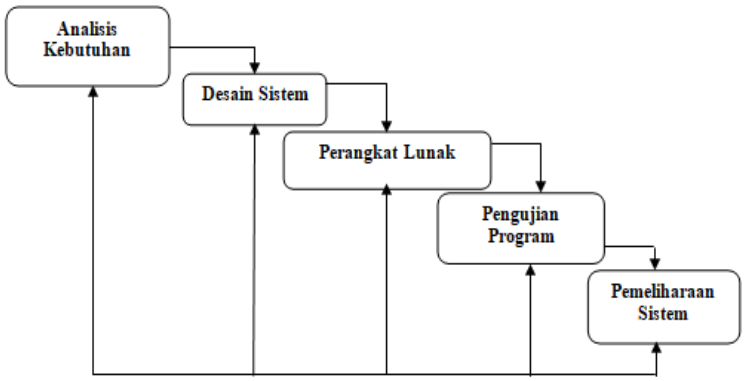

Figure 4. Waterfall Method

The explanation of the waterfall method above is as follows:

1. Needs Analysis
   This step includes activities such as: needs analysis, literature review, initial classroom observations, identification of problems encountered in learning, and also collecting data on supporting and inhibiting factors in managing and disseminating knowledge [14].
2. System Design
   Researchers make product development design plans. Important aspects in the plan include what the product is about, what its goals and benefits are, who the users of the product are, why the product is considered important, where is the location for product development and what is the development process [15].
3. Software
   Researchers also develop initial product forms that are temporary (hypothesis). The products made are complete and as good as possible, such as completeness of program components, implementation instructions (juklak), technical instructions (juknis), examples of knowledge management and knowledge dissemination.
4. Program Testing
   Researchers conducted a limited trial of the initial product in the field involving three stakeholders (system users involved such as Administrators, Health Workers and the Community) who were involved with the product that had been built. During the trials,

DOI: 10.31253/te.v8i1.3181

researchers can observe stakeholder activities in implementing the product [16]. After completing the trials, the researchers then held discussions with stakeholders.

5. System Maintenance
   Software that is difficult to deliver will undergo improvements and improvements to the product based on the results of limited trials.

V. RESULT

Analysis

a. Running System Analysis

Most of the existing knowledge at the Sawit Seberang Community Health Center UPT is still in the form of knowledge of individual health workers which has not been properly documented. Every year there is always a change of health workers, both those who leave and enter the UPT of the Sawit Seberang Health Center, because the health workers retire or get transfers to other places. This is of course a problem for UPT Puskesmas Sawit Seberang, if health workers who leave or retire have received training and knowledge during their work but have not documented the results of their training and knowledge in the form of work documents that are stored properly. Knowledge that is not well documented is very vulnerable to the loss of existing knowledge and will make it difficult for new health workers to continue the tasks left behind by health workers who have retired or been transferred. Another problem is that every health worker has quality skills and knowledge which are still in the form of ideas and have not been documented and it would be good if the knowledge they possessed could be distributed evenly to other health workers and become useful knowledge for the community so that the process of sharing knowledge and its dissemination is even in the UPT. Seberang Palm Oil Health Center.

b. KMS Team Analysis

The Knowledge Management System team consists of: a. Admin is an officer who must ensure the system continues to run well, control the data that will be published and manage user management b. Members are all Health Workers and the public who have registered with the system who can utilize the Knowledge Management System which is tailored to their needs. c. General: all people who are not registered can take advantage of the Knowledge Management System which is tailored to their needs.

c. KMS Needs Analysis

Based on the results of observations that have been made, the following are the general needs at the Sawit Seberang Community Health Center UPT to support the knowledge creation process based on the Inukshuk Model:

1. Socialization
   a) System Requirements: The system provides a knowledge creation process from Tacit to Tacit Knowledge.
   b) Form of Application in the System: Search, Chat, Forum, View Knowledge, Download Documents features.
2. Externalization
   a) System Requirements: The system provides a knowledge creation process from Tacit to Explicit Knowledge based on external documents.
   b) Form of Application in the System: Document upload feature, forum discussion results create a conclusion.
3. Determination / Combination
   a) System Requirements: The system provides a knowledge creation process from Explicit to Explicit Knowledge.
   b) Form of Application in the System: Document upload and knowledge management features.

DOI: 10.31253/te.v8i1.3181

4. Internalization
   a) System Requirements: All knowledge data that has been documented can be shared and read by all Members and the General Public.
   b) Form of implementation in the system: Document Search feature, Document Sharing feature.
5. Leadership
   a) System Requirements: Leaders manage documents and knowledge by directing and controlling the knowledge or documents to be shared.
   b) Form of Application in the System: Knowledge Management Feature (Changing and Deleting Knowledge).
6. Culture
   a) System Requirements: Providing awareness to every health worker in implementing the knowledge management system by providing several aspects of assessment which include: motivation to share knowledge, communication and collaboration.
   b) Form of Application in the System: Points and Reward Features for Documents and Knowledge that are useful for the community.
7. Information Technology
   The recommended technology for implementing knowledge management for this company is to use hosting and internet domains to make it easier for users to access documents and knowledge and manage knowledge online.

System Design

Look at the following design in Figure 6. KMS Use Case Diagram. This system design uses the UML modeling language.

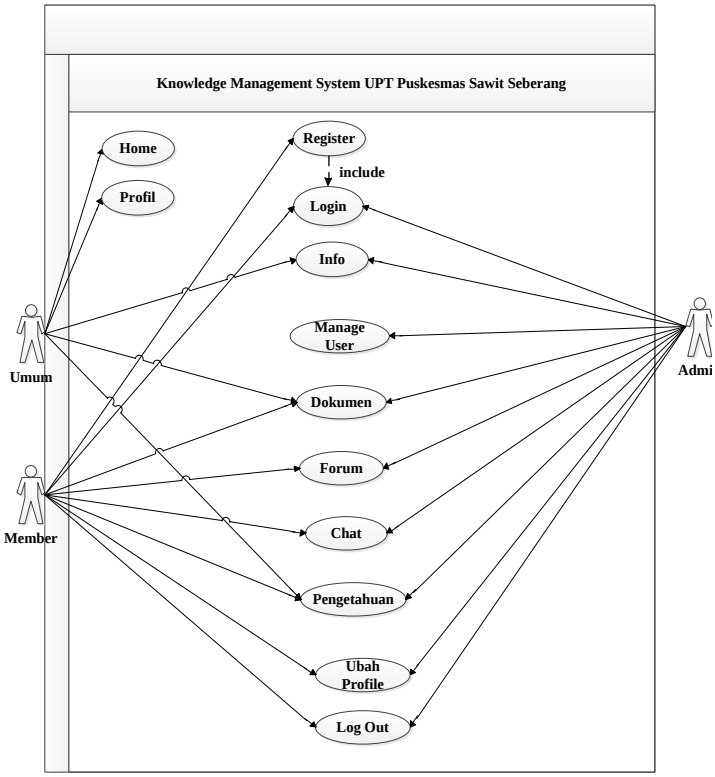

Figure 5. KMS Use Case Diagram

DOI: 10.31253/te.v8i1.3181

System Implementation

The results of the implementation of KMS Puskesmas are as follows:

1. General Home Page Display
   The general home page display can be seen in Figure 6 below:

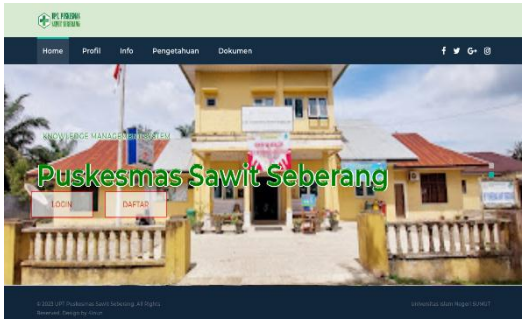

Figure 6. General Home View

2. Login View
   The login display can be seen in Figure 7 below:

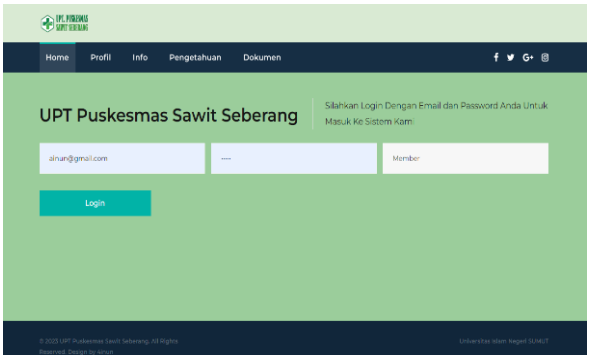

Figure 7. Login Display

3. Document View (General)
   The document display is shown in Figure 8 below:

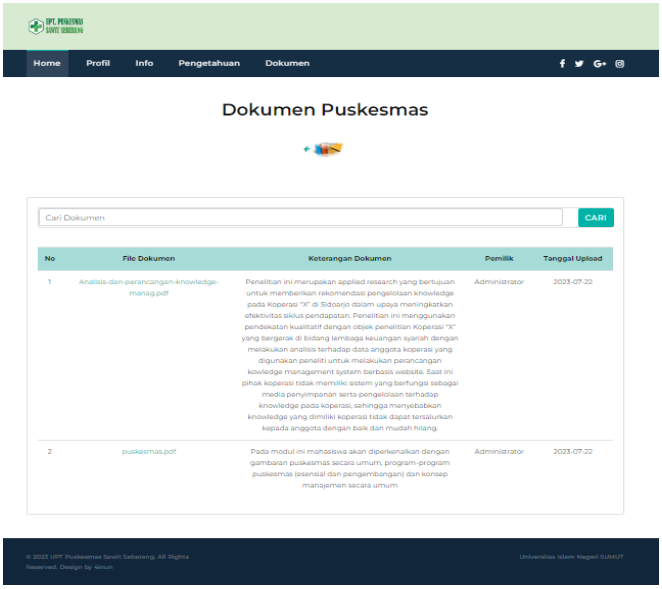

Figure 8. Document View (General)

4. Knowledge View (General)
   The Knowledge Display is shown in Figure 9 below:

DOI: 10.31253/te.v8i1.3181

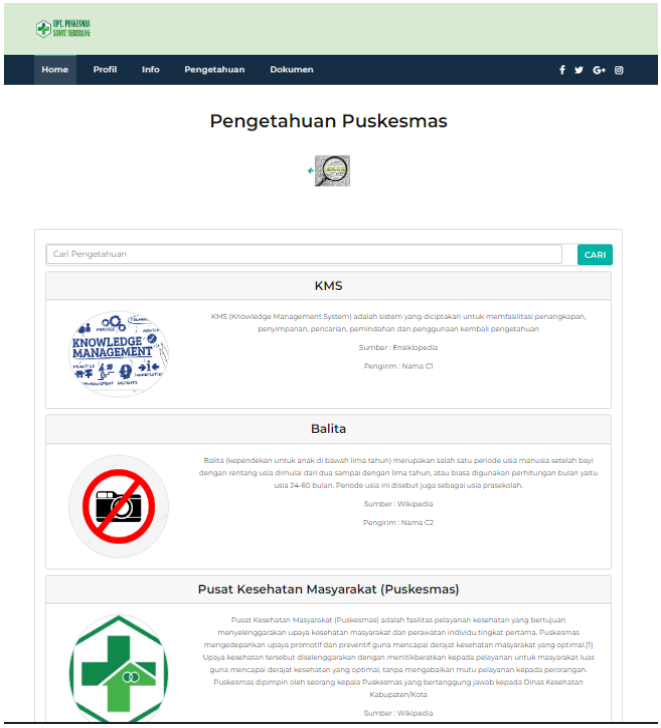

Figure 9. Knowledge View (General)

5. User View (Admin)
   The user display can be seen in Figure 10 below:

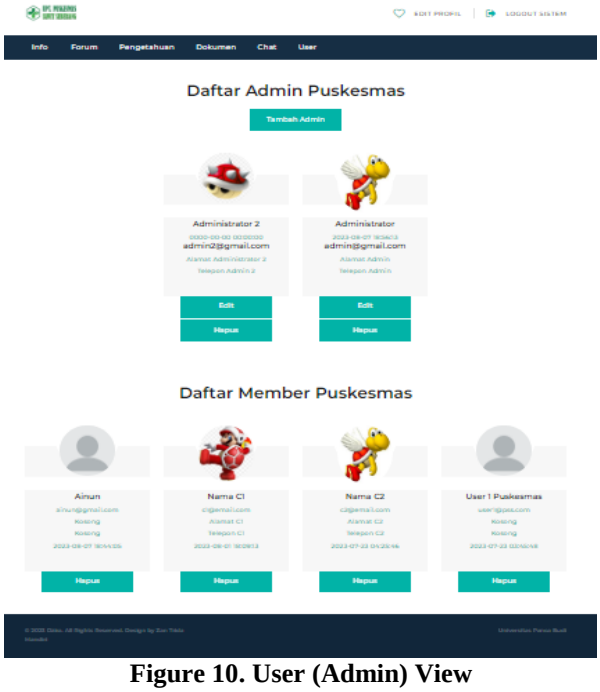

Figure 10. User (Admin) View

DOI: 10.31253/te.v8i1.3181

VI. CONCLUSION

Based on the Knowledge Management System that has been built, several conclusions can be drawn as follows:

1. The Knowledge Management System (KMS) that was built can make it easier for puskesmas medical personnel to manage existing knowledge in the puskesmas environment.
2. Knowledge obtained from training, workshops and thoughts from individuals at school (tacit knowledge) can be made into online documents (explicit knowledge) which can be shared with other medical personnel and the community.
3. This KMS application can be accessed online so that access to knowledge can be done from anywhere using a smartphone or laptop device connected to the internet.

To ensure the sustainability of the Knowledge Management System and the ongoing benefits it provides, the following steps can be considered:

1. Regular updates and improvements to the KMS should be scheduled to incorporate new medical knowledge, technological advancements, and user feedback. This will keep the system relevant and useful for medical personnel.
2. Ongoing training programs should be established for medical personnel to effectively utilize the KMS. Additionally, technical support should be readily available to address any issues or questions that arise during use.
3. Encouraging active participation from medical personnel in the use of the KMS can be facilitated through regular feedback mechanisms. Surveys, focus groups, and user forums can be utilized to gather insights and suggestions for system enhancements.
4. The KMS should be integrated with other existing healthcare systems and databases to ensure a seamless flow of information. This integration can enhance the comprehensiveness and accuracy of the knowledge available within the system.

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DOI: 10.31253/te.v8i1.3181

BIOGRAPHY

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Ilka Zufria, serves as Head of the Computer Science Study Program at the Faculty of Science and Technology, North Sumatra State Islamic University, Medan, Indonesia. Starting his teaching career in 2007, he is now actively teaching at the Faculty of Science and Technology, North Sumatra State Islamic University.

DOI: 10.31253/te.v8i1.3181