

# Knowledge Management System in Rental Company with Socialization, Externalization, Combination, Internalization Method Case Study: PT Surya Sudeco

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## Abstract:

Knowledge in an organization is an important thing to anticipate competition with business opponents. At this time, PT Surya Sudeco already have a way to transfer knowledge. However, to manage organizational knowledge, several problems found. First, no distinction found between obsolete forms and new forms that should be used in a corporate environment that will cause a repetitive job such as reprinting and collecting signatures. Second, urgent tasks could be delayed, due to employees' permission / leave. Third, the occurrence of knowledge walkout. Fourth, centralized storage of knowledge-based assets is not found. Fifth, an occurrence of repeating mistakes, which should be avoided. The authors propose a prototype of knowledge management system (KMS) with nonaka model, socialization, externalization, combination, internalization (SECI) to convert knowledge from tacit to explicit and the other way around. The prototype method is used for this software development process. Sample collection techniques, questionnaires and interviews will be used for collecting data. This research has been tested by using user acceptance test (UAT), and the test results get a percentage of 82.5% which means the system is acceptable and as expected.

*Keywords* — SECI, Knowledge Management System, UAT, Nonaka, Surya Sudeco

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## I. INTRODUCTION

### 1.1. Background

The topic of knowledge management (KM) has attracted much attention in the last decade. Particularly within a corporate organization, knowledge is an asset of a company that must be protected, guarded, disseminated among its members and also developed in order to add value to the company and the quality and quantity of the resulting product.

There are many companies have failed tried to make their company different from others, only by using innovative technology. Technology, unfortunately, is too easy to copy. Even if you have copyright protection for your new technology, your technology can still be copied by global competitors

in countries where domestic copyright laws are difficult to enforce. Or your copyright will give you a temporary competitive advantage of about 17 years (average age of copyright in the United States). Unlike copyable technology or market share that can be threatened by price reductions, knowledge provides a source of competitive advantage that is difficult for competitors to copy. Even if they successfully copy your knowledge management technology, they can not reuse it without the context that drives the KM system to a successful outcome. (Tiwana 2000)

Based on Lisa Quast (2012) the authors conclude that the main reason why managing knowledge actively important to a company's success is KM can facilitate decision-making. Data can offer managers a great deal of information but

processing enormous amounts can hinder high-quality decision making. Although information overload or the need for knowledge from people in other divisions of the company for decision making can complicate the manager. Implementing a knowledge management system (KMS) can facilitate better and more appropriate decisions.

Managing knowledge actively can build learning organization by doing routine learning. And managing knowledge can stimulate cultural change and innovation. By actively managing knowledge in organizations can also stimulate cultural change and innovation by encouraging the flow of free ideas. (Lisa 2012)

An international website (Lamp 2017), entitled "Information System Journal Statistics", presents dynamically generated statistics from the index of the percentage of international journals uploaded on the site, where Indonesia, Japan and Pakistan are in the lowest sequence, which accounted for 3% each. United States (US), is the country's most contribute international journal of knowledge management by 27% in 2017.

Internationally, renowned corporate companies related to KM include: Adobe, through digital media solutions and digital marketing solutions that transform the way customers design and deliver exceptional digital experience. Microsoft, through the development process, licensing and supporting various software products and services in the areas of productivity, business processes and intelligent cloud. Oracle, through the use of a comprehensive and integrated set of cloud applications, as well as engineered service platforms and systems. And IBM, through its technology portfolio and enterprise content solutions, including predictive analytics and data visualization. (Haimila 2017). Nationally, well-known corporations that use KM include: Pertamina, using a web-based portal for sharing knowledge. Telkom, through the implementation of innovation T.I.M.E uses 3 elements of KM (knowledge organization, knowledge worker, and technology) (Supriyanto 2010).

PT. Surya Sudeco which is a company with its main business is the provision of vehicle rental services. The company started operations in 2000

and provides shortterm and longterm rental services. In running their daily transactions, employees rely on the tacit knowledge they have to apply in the work. To be able to request the help of another department to do a job, it takes a variety of forms, found problems where, employees sometimes do not use the most recent form (update), due to the varied version of the form, resulting in wasted time to reprint, and re-signing. Each year there is the possibility of issuing the latest revision form.

Every employee who has worked 12 months in a row is entitled to an annual break for 12 days and earns full wages. It is already set in the rules of the company, 78% of the total 232 employees in the company is a senior who has a working period of about 6-10 years. The problem is found when an employee is unable to enter, another employee who will be assigned that day will be assigned to replace his or her work on that day, it will be difficult to complete the job beside because the employee is unable to attend, the replacement employee still needs to figure out how to solve the job. It is less economical if the company employs many employees just to replace other employees who are unable to attend, and this will pose a risk of delay in the work.

The process knowledge walkout by the employee that have good tacit-knowledge quality, has several disadvantages, among others, the transfer of assets owned by the company's knowledge, outside the company. That is unfortunate if such knowledge falls into the hands of competitors. Knowledge that should work to make revenue for the company, will be used by competitors to compete with the company.

In 2011, there were 90 employees out of 300 people quitting the company, in 2012 there were 82 employees from 320 people, and by 2013 there were 63 people out of a total of 330 people who quit the company. In those 3 years, there are 235 people who potentially have valuable knowledge for the company, moving to another company.

Having no centralized storage of knowledge-based assets will risk the document to be tipping or missing. especially if the data is needed immediately, it will be hard to find it. Some of the

experience that employees have, stored in each tacit, is also stored and documented by their respective departments into the material, stored in a document file on the computer.

The mistakes made by newly joined human resources, which have also been repeating mistakes before, have become a form of unnecessary repetition of errors.

Knowledge management system using socialization, externalization, combination, and internalization (SECI) method is expected to be the most effective way to solve the problem of sharing, transfer knowledge, and share the best problem solving among employees in PT Surya Sudeco.

## **1.2. Research Problem**

### **1.2.1. Identification of Problems**

Based on background and research problem, can be identified some problem that is as follows:

1. There is no distinction between obsolete forms, and new forms that should be used in corporate environments, thus adding repetitive work time such as print and signature.
2. Delays are urgent, due to the employees who usually do it permission / leave.
3. Knowledge walkout, leads to reduced knowledge of the company individually or company, and have risk knowledge of the company move to competitor company.
4. No centralized storage of knowledge-based assets, so there is a risk of missing information, tucked, and users will be difficult to find.
5. The occurrence of repeating mistakes (repeating mistakes), which should be avoided.

### **1.2.2. Restricting the problem**

As for the scope in the boundary problem is as follows:

1. Supporting data using data that is general, and not a secret company without reducing the purpose of research.
2. This research uses web technology using SECI model and prototype method for software development.
3. This research will be tested using User Acceptance Test (UAT) method. Employee PT Surya Sudeco will acts as the user

### **1.2.3. Formulation of the problem**

Referring to the identification of the problem and limitation limits, the author aims to conduct this research to answer questions about this question KM.

1. What kind of knowledge management system model that suitable for the needs of PT Surya Sudeco employees?
2. How is the prototype knowledge management system that suitable for managing knowledge among employees in PT Surya Sudeco?
3. How to test prototype knowledge management system at PT Surya Sudeco?

## **1.3. Objectives and Benefits of Research**

### **1.3.1. Research Objectives**

Based on the formulation of the problem, the purpose of this study is:

1. Designing ideal KMS model as per company requirement.
2. Produce a prototype knowledge management system with SECI model to overcome the storage and sharing tacit explicit knowledge among employees.
3. Identify the basic needs of KMS that will be used to conduct the process of managing knowledge among employees in order to improve the knowledge sharing culture.

### **1.3.2. Research Benefits**

Benefits This research is expected:

1. Assisting the company in establishing and managing the organizational knowledge based on the design result in this research.
2. Interesting users to share explicit tacit knowledge in this system.
3. Helping the company improve the performance of the delayed work (pending) or repeated mistakes, based on the not yet established knowledge management.

## **II. THEORETICAL BASIS**

Contains about theories related to knowledge, Knowledge Management, SECI, explicit, tacit, socialization, externalization, combination, internalization, and tools used. While the study review contains the research - research that was

done earlier, review of research objects, as well as the framework of concepts and hypotheses.

### **2.1.1. Knowledge theory**

According to English dictionaries (Oxford dictionaries) The authors conclude that the word knowledge can refer to a theoretical or practical understanding of a subject. It may be implicit (such as practical or skill expertise) or explicit (such as a theoretical understanding of a subject).

In his book, *Fear of Knowledge: Against relativism and constructivism* Paul Bughossian says that in philosophy, the study of knowledge is called epistemology. The famous Plato philosopher defines knowledge as a justified true belief, although this definition is now thought by some analytic philosophers to be problematic because of the Gettier problem while others maintain the platonic definition. (Paul 2007)

### **2.1.2. Knowledge Classification**

There are two types of knowledge in organizations, tacit and explicit (Nonaka 1994).

1. Tacit Knowledge is rooted in action, experience, and involvement in a particular context. Tacit knowledge consists of a combination of cognitive and technical elements (Nonaka 1994). The cognitive element refers to an individual mental model consisting of mental maps (mental maps), beliefs, paradigms and points of view. The technical component consists of knowledge, crafts and concrete skills that apply to a particular context. The example given is the knowledge of how best to approach certain customers for example by using flattery, using hard sell, using a no-nonsense approach. Junnarkar and Brown (Brown 1998) suggest that "Tacit knowledge is implied but not really documented" assuming that it is silent because one can not articulate it, but because it has not been documented. Snyder (Snyder 1998) even suggested that an expert is an expert insofar as he has a large reservoir (Vast reservoir) of tacit knowledge in certain situations.
2. Explicit Knowledge is articulated, codified and communicated in symbolic and / or natural language. The classification of knowledge based on the tacit and explicit dimensions of Nonaka has been widely quoted, but the danger

of this classification is the apparent assumption that tacit knowledge is more valuable than explicit knowledge. In essence, this is equivalent to equating the inability to articulate knowledge with its value. According to other opinions such as Cole (Cole 1998), assume that tacit knowledge is more complex than explicit, simply because it has not been articulated. Few, however, question the complexity of meningitis diagnostic research compared to writing a freshman English essay, but researchers have previously made explicit in expert systems while the latter are largely unarticulated. (Nonaka 1995) argues that the fundamental reason why Japanese companies are successful is because their skills and experience are in the creation of internal organizational knowledge. Creation of knowledge is achieved through the introduction of a synergic relationship between tacit knowledge and explicit knowledge. Ikujiro Nonaka and Hirotaka Takeuchi in 1991 and 1995 differentiated between tacit knowledge and explicit knowledge, and divided the knowledge conversion model into 4 ways, as follows:

1. Tacit to tacit (Socialization)
2. Tacit to explicit (Externalization)
3. Explicit to explicit (Combination)
4. Explicit to tacit (Internalization)

### **2.1.3. Data, Information and Knowledge**

In his book "Knowledge Organizations: What Every Manager Should Know", Jay Liebowitz says that the Full Service Intranet is a network within the company that connects workers and company information in ways that can make workers more productive, accessible, and navigate through resources (resources) and applications around the company's computer network is continuously better than ever before.

Data, information and knowledge are something different, therefore Dave (Dave 1998) distinguishes the notion of data, information and knowledge as follows:

### **1. Data**

Data is a collection of objective and discrete facts about events. In the organizational context, the data is best described as a structured record of transactions.

When a customer goes to a gas station and fills the tank of his car, the transaction can be partially explained by the data: when he makes a purchase, how much he buys, how much he pays it. The data tells nothing about the reason he went to the gas station and nothing else, and can not predict how likely it is to return. In and of themselves, the fact does not say anything about whether the gas station is running well or badly, whether it fails or develops.

Peter Drucker (1993) says information is data that has relevance and purpose, which of course shows that data by itself has little relevance or purpose.

### **2. Information**

Like many researchers who have studied the information, we will describe it as a message, usually in the form of document or communication that is heard or seen. Like any other message, it has both sender and receiver. Information is meant to change the way the recipient perceives something, to impact his judgment and behavior. he must inform; it is the datanyalah making the difference. The informal word originally means "giving shape to" and the information is meant to form the person who receives it, to make a difference in their views or insights. Then afterwards the recipient (not the sender) decides whether the message he received is actually information or not. That is, if the data it gets really informs it. A memo filled with unrelated rambling may be regarded as information by the author but rated as a vote by the recipient. The only message that can be communicated successfully is unintentional about the quality of intelligence or decisions of the sender.

### **3. Knowledge**

Most people have an intuitive sense that knowledge when compared to data or information is a wider, deeper, and richer thing. People talk about individuals who have extensive knowledge, and mean someone who has an understanding of a

comprehensive, informative, and reliable subject, an educated and intelligent person. They can not talk about a knowledgeable or even a memo, a manual, or a database that contains knowledge-full, even though it may be made by a knowledgeable individual or group.

Because epistemologists spend their lives trying to understand the meaning of finding out something, we will not pretend to give a definite explanation. What we offer is a definition of tentative knowledge, a functional pragmatic description that helps us communicate what we mean when talking about knowledge within the organization. Our definition reveals the characteristics that make valuable knowledge and characteristics (although it often the same) that make it difficult to manage it well.

#### **2.1.4. Knowledge Management Definition**

Knowledge management is a tool, technique, and strategy to maintain, analyze, organize, improve, and share business expertise. (Groff and Jones 2003, 2)

Knowledge management is dominated by information management under another name (semantic drift). (Davenport and Cronin 2000, 1). On the other hand, Hobohm argues that knowledge management is one of the concepts that librarians have to assimilate, just to reflect on what ultimately other societies to colonize our domain. (Hobohm 2004, 7).

#### **2.1.5. Benefit of Knowledge Management System**

Quoting from his book "Knowledge management in theory and practice, Second Edition" related to the benefits of Kimiz Dalkir's (Kimiz Dalkir 2011) knowledge management revealed:

For individuals, KM is useful for:

1. Help people carry out their work and save time through better decision-making and problem-solving.
2. Building a sense of attachment as a community within the organization.
3. Help people to keep abreast of developments.
4. Provide challenges and opportunities to contribute.

For community, KM is useful for:

1. Building professional skills.

2. Promote peer-to-peer mentoring.
3. Facilitate more effective networking and collaboration.
4. Develop a professional code of conduct that can be obeyed by its members.
5. Develop a common language.

For organization, KM is useful for:

1. Help drive strategy.
2. Troubleshoot quickly.
3. Spread the way to complete the work evenly.
4. Increase understanding that resides within products and services.
5. Divide the two ideas and increase the chance to innovate.
6. Allows the organization to move a step further in the competition.
7. Building organizational memory.

#### **2.1.6. Knowledge Management Process**

The purpose of knowledge management is to improve the organization's ability to perform core processes more efficiently. Davenport et.al (Davenport et.al 1988) describes the general objectives of the knowledge management system in practice as follows:

##### **1. Creation**

Knowledge is created as humans define new ways to do things or create know-how. Sometimes external knowledge is brought into the institution's organization.

##### **2. Capture**

New knowledge is identified as valuable and represented in a sensible and digestible way.

##### **3. Crawling**

New knowledge must be placed in context to be actionable. This shows the human depth (tacit quality) that must be captured along with the explicit facts.

##### **4. Saving**

Useful knowledge should be stored in a good format in the storage of knowledge, so that others within the organization can access and also use it.

##### **5. Processing**

Knowledge as a library, knowledge must be made up-to-date. It should be reviewed to explain whether the knowledge is relevant or accurate.

##### **6. Sharing**

Knowledge must be available in a format that is beneficial to all persons or members within the organization requiring such knowledge, wherever and available at all times.

#### **2.1.7. Relation of Knowledge Management, Business Strategy and Knowledge Strategy**

As described in his book "The Knowledge Management Toolkit", Amrit Tiwana (Tiwana 2000) explains that in order to articulate strategy-knowledge linkages, the company must explain its strategic intentions, identify the knowledge needed to actually execute those strategic choices, the strategic knowledge gap by comparing it to its actual knowledge assets. The strategic choices your company makes about technology, markets, products, services, and processes have a direct impact on the knowledge, skills and competencies needed to compete in the desired market.

#### **2.1.8. Knowledge Management Framework**

New understanding is always developed and adapted to the organization's experience in implementing KM. With conditions like the above, Bukowitz and Williams in his book "Knowledge Management Fieldbook" conduct research to get an approach that can be used as a guide to develop KM in the company.

Bukowitz introduces a KM framework and diagnostic methods of organizational conditions in applying KM in the form of KMD (Knowledge Management Diagnostic). According to Bukowitz, the KM framework is developed from two activities that occur simultaneously in an organization.

Nonaka, Konno, and Toyama [Nonaka 2001] describe the SECI model as a continuous process of knowledge creation, whereas according to Nonaka's thought [Nonaka 2001] the SECI Model is a frame or picture of a repeatedly created process of knowledge creation, which allows analysis and evaluation of existing workflows in the real world. SECI itself is a framework in the creation of knowledge that can be actualized.

The components contained in the SECI model are:

##### **1. Socialization (Tacit to Tacit)**

This dimension explains social interaction as a means of transferring knowledge by means of tacit

to tacit, sharing of tacit knowledge can be done face-to-face or through experience. For example, meetings and brainstorming can support such interactions. Because tacit knowledge is difficult to serve as a formal and often takes time and place is clear, tacit knowledge can only be obtained through shared experience, such as spending time together or living in the same environment. Socialization usually occurs in traditional apprenticeship, where apprentices learn tacit knowledge needed in their skills through direct experience, not from written manuals or textbooks.

**2. Externalization (tacit to explicit)**

Among tacit and explicit knowledge by means of externalization (publishing and articulation of knowledge), factors that can thrive, which can instill combined knowledge that enables them to communicate. For example, a written concept, image and document can support this kind of interaction. When the tacit knowledge is made into explicit, the knowledge is crystallized, or the term is frozen to allow this knowledge to be shared with others, and this frozen knowledge can form the basis of new knowledge. The concept of creation in new product development is an example of this change process.

**3. Combination (dari explicit ke explicit)**

Processing knowledge from explicit to explicit by doing combinations (organizing, mixing knowledge), combining different types of explicit knowledge, eg building a prototype. The use of computerized communications networks and large-scale databases when used creatively can support this mode of knowledge conversion. Explicit knowledge is collected from within or from outside the organization and then combined, re-edited or in the process of forming new knowledge. The new explicit knowledge is then disseminated within the company members.

**4. Internalization (explicit to tacit)**

Processing knowledge from explicit to tacit by using internalization (the process of receiving knowledge and the implementation of individual knowledge), covered by learning by doing it yourself. On the other hand, explicit knowledge becomes part of the individual's knowledge and will become an asset to a company. Internalization is

also the ability to see connections and recognize patterns and capacities for the process of understanding between fields, ideas and concepts.

**2.1.9. UML**

UML (Unified Modeling Language) is an object-based general model with technical diagrams that are quite effective in modeling every system development project from the analysis phase to the design and implementation phases (Dennis et al, 2012).

**1. Use Case Diagram**

Use case diagram is a diagram that captures business needs for the system and to describe the interaction between the system and its environment (Dennis et al, 2012)

**2. Activity Diagram**

Activity diagrams are those that describe an independent business workflow from a class, an activity sequence in a use case, or a detailed design of a method (Dennis et al., 2012).

**3. Sequence Diagram**

Sequence diagrams are a sequence of dynamic models describing examples of classes that participate in use cases and messages passing between them over time (Dennis et al., 2012).

**4. Class Diagram**

Class diagram is an illustration of the relationship between the classes modeled in the system. Class diagrams are very similar to the entity relationship diagram 30 (ERD).

**2.1.10. Prototype**

Prototype is the initial blueprint form of an entity. In the development of the system occurs the state of the system users have actually defined the general software and have not defined in detail the input, process and output. While development is not uncommonly facing doubts about the effectiveness, efficiency and quality of the algorithm being built, the adaptability of the system to its operating system or the view it is currently designed.

**2.1.11. Prototyping Method**

Prototyping is the most widely used software development method among the available development methods. This prototyping method between developers and customers can interact and exchange ideas during the system development process. To overcome the disparity between

customers and developers, it must be required a compact cooperation so that developers will know exactly what the customer wants by not neglecting some technical aspects and customers more quickly know the processes in the system menghasaikan desired. The key to a successful prototype model is to define some rules of the game, ie the customer and the developer must agree that the prototype is built to define the needs. The prototype will be partially or completely removed and the actual software is engineered with predetermined quality and implementation.

#### **2.1.12. Software Testing**

Software testing is an investigation conducted to obtain information about the quality of the product or service under test (under test). Software testing also provides an objective and independent view of the software, which is useful in business operations to understand the degree of risk to its implementation. Testing techniques include, but are not limited to, the process of executing a part of the program or the entire application in order to find software bugs (errors or other defects).

#### **2.1.13. Principle of Testing**

Before applying this testing method, you should first understand the basics of the Software principles that guide the testing of software better and more efficiently in the testing phase. Here's a set of testing principles:

1. All tests should be traceable from the initial requirement requirement.
2. Testing should start from the smallest and progress to a great test.
3. To be more effective, testing should be performed by an independent and experienced third party.

#### **2.1.14. User Experience (UX)**

User experience refers to one's emotions and attitudes about the use of certain products, systems or services. It includes the practical, experiential, affective, meaningful and valuable aspects of human-computer interaction and product ownership. In addition, User experience includes a person's perception of aspects of the system such as usability, ease and efficiency. User experience can be considered subjective according to the level of perception and individual thinking of the system.

User experience is dynamic because it keeps changing over time due to changing circumstances and changes to individual systems and the context of wider usage in which they can be found. Ultimately the user experience is about how users interact and experience in using the product. (Leah 2013)

#### **2.1.15. User Interface (UI)**

User Interface (UI), is the space where the interaction between human and machine occurs. The purpose of this interaction is to enable effective operation and control of the machine from the human, while the engine simultaneously provides feedback information that helps the operator decision-making process. Examples of this broad user interface concept include interactive aspects of the computer's operating system, heavy machine operator control, and process control. Consideration to apply design when creating user-related interfaces or involving disciplines such as ergonomics and psychology. In general, the purpose of designing user interfaces is to produce user interfaces that simplify, efficiently, and user-friendly to operate the computer in a way that produces the desired output. Means the operator needs to provide minimal input to achieve the desired output, and also the computer to minimize the output that is not wanted by humans. (Stephane 2014)

#### **2.1.16. Testing Method using UAT**

According to an article written by Margaret Rouse (Margaret 2010), in software development, user acceptance test (UAT) - also called beta testing, application testing, and end user testing - is a software development phase where software is tested by audiences addressed. UAT can be done by testing in a place where volunteers or paid test subjects use software or, more specifically for widely distributed software, by making test versions available for download and trial via the web. The user experience will be forwarded back to the developers who made the final changes before commercially releasing the software.

### **2.2. Study Review**

#### **2.2.1. Study Review of Sachin K. Patil, Ravi Kant (2013)**

The purpose of this study is to identify and prioritize solutions to the use of Knowledge



Management (KM) in Supply Chain (SC) to overcome the barriers contained therein. This research helps organizations to concentrate on high-level solutions and develop strategies to apply them on a priority basis. This paper proposes the Framework based on fuzzy analytical hierarchy (AHP) techniques and fuzzy techniques for order performance in tandem with the ideal solution (TOPSIS) to identify and rank the KM adoption solutions in supply chain and overcome the constraints. AHP is used to determine the weight of resistance as a criterion, and TOPSIS fuzzy method is used to obtain the final ranking of KM adoption solutions in the supply chain. An empirical case study analysis of a hydraulic valve manufacturing organization was undertaken to illustrate the use of the proposed framework for determining KM adoption solutions in SC to address its constraints. This proposed framework provides more accurate, effective and systematic decision support tools for the gradual implementation of KM adoption solutions in SC to improve their success rate.

**2.2.2. Study Review of Alberto Unjan, Vilma Contreras (2016)**

The purpose of this paper is to propose a model to anticipate the success of the use of Knowledge Management System (KMS) by doctoral researchers. Doctoral researchers preparing for a doctoral dissertation are required to prepare tools to manage the knowledge they collect. This tool is based on database engineering, and the author of this paper will use the tool to collect data about the knowledge they use. Doctoral researchers will feel satisfaction in the use of this tool, depending on the internal aspects they previously felt, such as ease of use, usability, or quality. There are also external aspects such as rewards, beliefs and social norms that can affect perceived satisfaction. In conclusion, correct identification of internal and external aspects can improve the success of KMS use. (Alberto 2016)

**2.2.3. Study Review of Alexander Serenko, Nick B, Emily H (2015)**

The purpose of this study is to determine the level of maturity of knowledge management (KM) of credit unions. Implementing the 15-maturity model of credit unions in North America reveals

that the overall maturity level of KM is at an early stage of development, but there are signs of improvement in the future. Credit unions operate in a highly competitive and knowledge-intensive financial industry and experience various pressures to improve their efficiency, which they can achieve through the implementation of KM solutions. Despite the absence of an official KM strategy, KM projects are introduced locally to fill certain knowledge gaps. The availability of IT infrastructure and the application of KM-related technologies alone is not sufficient to ensure the universal success of the organization's KM activities. Credit unions managers regularly access and use academic research in their decision-making. At the same time, they prefer access to scientific knowledge in the form of translations from books, practitioner magazines, and consultants. It was concluded that competing organizations in the knowledge-intensive sector had a core need for KM solutions. (Alexander 2015)

**2.3. Overview of Research Objects**

In this section, the author briefly describes the company profile.

**2.3.1. Company Profile**

PT. Surya Sudeco (Tunas Rental) is a company with major business in the provision of leasing and automotive fleet management services. Tunas Rental commenced operations in 2000. As it grew, Tunas Rental was separated into the new company PT Surya Sudeco in 2005. Rental Tunas provides short and long term rental services (Short & Long Term).

Tunas Rental is a subsidiary of Tunas Group Ridean (Tunas Group). The Group operates an internationally recognized automotive sales network such as Toyota, Daihatsu, BMW and Peugeot, and a major Honda motorcycle dealer. The business also includes used cars, automotive financing through PT Mandiri Tunas Finance, and leasing and automotive fleet management through PT Surya Sudeco. At the time of its initial public offering (IPO) in 1995, Jardine Motor Group (now Jardine Cycle and Carriage Ltd) acquired a 25.0% stake in Tunas Ridean Group. Its ownership became 43.84% of the company on Dec.2013. Surya

Sudeco has a strong commitment to serve customers with excellent service. This is proven by ISO 9001 certification.

#### **2.4. Concept Research Framework**

Based on problem identification, research objectives, theoretical studies and studies of previous research, it is defined to construct a research concept framework.

Initial conditions, there are some obstacles that make the company should be able to move quickly but constrained by some problems. As there is no distinction between obsolete forms, and new forms that should be used in corporate environments, it adds repetitive work time like prints and signatures. Delays are urgently needed, due to the employees who usually do it permission / leave. Knowledge walkout, leads to reduced knowledge of the company individually and firmly, and has the risk of knowledge of the company moving to a competitor company. No centralized storage of knowledge-based assets, so the risk of missing information, tucked away, and users will be difficult to find. The occurrence of repeating mistakes (repeating mistakes), which should be avoided.

Then made a problem formulation of the initial conditions. To answer the problem formulation, research methodology is used to produce output in the form of prototype application of knowledge management system (KMS) which becomes solution at root of problem.

#### **2.5. Hypothesis**

Based on the conceptual framework that has been described, then made some hypothesis as follows:

1. It is alleged that the design of KMS model to assist in alleviating the needs of employees in PT Surya Sudeco is the SECI model as the basis for supporting the preparation of requirements on the system to be developed.
2. It is alleged that the design of this KMS prototype can be applied well using prototype method in web based.
3. It is assumed that the KMS prototype of PT Surya Sudeco which is tested with user acceptance test (UAT) can be received well.

### **III. METHODOLOGY AND RESEARCH DESIGN**

The research method used is by collecting samples and data collection. The study was conducted for 3 months. Data collection in this research was conducted in several ways, such as field observation, interviews and surveys with questionnaires. Prior to the dissemination trial and error of the questionnaire prepared, and the results of the questionnaire conducted quality and reliability testing. Sampling using Slovin method. In the use of this function, it is determined what is the limit of the error tolerance. The limit of this error tolerance is expressed as a percentage. The author conducted a study with a 10% error limit which means having a 90% accuracy level.

$$n = N / (1 + N e^2) = 77 / (1 + 77 \times 0,10^2) = 43.5 \sim 43$$

Explanation:

*n*: Number of samples

*N*: Population

*e*: error tolerance

In order to get the exact target and the information obtained is not biased, then the survey results obtained from the trial application that can be accessed. The data collected include:

1. User needs for features and design
2. Level of interest and user satisfaction.
3. Competitive response needed to improve application quality.

Furthermore, the technical matrix table created is then analyzed and selected the priority item. In the end, the proposed design concept is based on developing the technical requirement matrix and user satisfaction needs.

Software testing is a critical element of software quality assurance and represents a central review of specification, design and coding. The author performs testing phase with User Acceptance Test (UAT) model which tested directly by PT Surya Sudeco employee representative.

#### **3.1 Analysis Technique**

The need for accurate and fulfilling analysis, encouraging experts in every field of science to

continue research as well as in knowledge management.

the prototype by way of UAT, whether it is in accordance with what the user needs.

**3.2 System Design Technique**

Design technique used in this research using approach method of Object Oriented Design (OOD) or object oriented design using Unified Modeling Language (UML).

**3.3 Software Testing Technique**

Software testing is a critical element of software quality assurance and represents a central review of specification, design and coding. The author performs the testing phase with the User Acceptance Test (UAT) model which is tested directly by the representative of the employees at PT Surya Sudeco.

The user acceptance test (UAT) criteria (in agile software development) are usually created by the customer and are declared in the domain language of the business. This is a high-level test to verify the completeness of the stories from users or stories that are run during sprint / iteration.

**Table 1 UAT Measurement Standards**

	Percentage	Explanation
A	91 - 100	Very In accordance with the chill
B	71 - 90	Appropriate, with little to add
C	51 - 70	Quite appropriate, with some to add
D	31 - 50	Less suitable, with much to add
E	0 - 30	Not Match, everything should be fixed

**3.1. Research Steps**

In the development of KMS For PT Surya Sudeco stages include: the stage of problem identification is done by conducting an interview on the operational team in the object of research, after the identification problems continue with the data collection will be done by observation or direct observation of the process business in the object of research, studying literature related to knowledge management system.

From the results of data collection, will be analyzed the needs of the desired user. The results of the analysis will be designed and modeled KMS. Model processed and will be the foundation in making designing prototype system, the design process consists of designing system specifications, database design, user interface design. From the design will be made prototype, the next step to test

**IV. RESULT AND DISCUSSION ANALYSIS**

**4.1. Grouping Analysis and Findings**

Based on the data that has been collected, then the data data is processed to be analyzed by the author and become a model prototype KMS, then that needs to be defined at the beginning is the characteristics of the respondents. This can be seen in the following table:

**Table 2 Profile of Respondents**

Profile	Explanation	Total	%
gender	Male	19	45%
	Female	24	55%
Reps	Marketing	3	7%
	Aftersales	10	23%
	QMS	10	23%
	Finance	10	23%
	Asset	2	4%
	IT	6	14%
	Legal	2	5%

**4.1.1. Analysis of Observation Results**

The authors made direct observations and received data on employee turnover support, multi-version forms, photographs that illustrated that knowledge management is not yet centralized and has its own system and email sample that can be used as a source of problem identification in order to get a more easily understood picture.

**4.1.2. Analysis of Interview Results**

The author conducted a brief interview to get a more detailed picture. This interview is done to employees in each department. Then some important points to note are:

1. Based on the results of question and answer from the respondents Employees in this company mostly use the sharing folder as a document storage container, which mixes between the work and the tutorial module files used to learn about the work or procedures workmanship, this can make the information difficult to access, because the contents of the file not searchable.

2. Use of email to share knowledge, will make the mixing of information between daily work and information that is really used as knowledge.
3. Functional requirement in this prototype required a search engine, which is useful to browse all information in post in this system, in order to accelerate the process of accurate data retrieval.
4. Non functional requirement on the prototype into the additional needs of the ease of access (including the speed of access to this system), as well as user interface that is easy to use.
5. The desire of a diverse user between the need or not KMS applications to be accessed publicly for various reasons. But here the authors choose to implement KMS locally first, in addition to the security, as well as required a system that has been well-done, not a prototype if you want to be considered by management to further implementation to production.

**4.1.3. Analysis user requirement through interview**

1. Based on the results of interviews, it can be analyzed several user requirements such as:
2. The combination of easily accessible security of information in the company's environment.
3. Easy to use system, user friendly.
4. Rapid system, both in access, and information search.
5. Systems that can be an alternative to store and share knowledge among employees, compared through email or 3rd party applications such as whatsapp.
6. Have access to different levels, and have login.

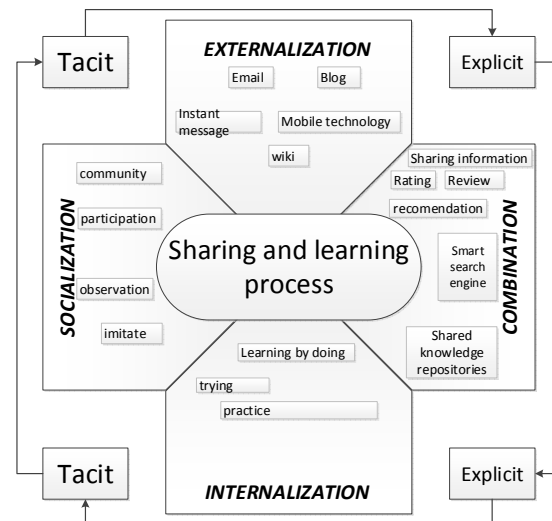
**4.1.4. Analisis user requirement by using questionnaire**

Research on this company using 7 questionnaire question. Its population is employees of PT Surya Sudeco Head office amounted to 77 people. The number of research samples if calculated using slovin is 43 people. Instruments such as interviews and surveys were used in this study. When the questionnaires were distributed, there were 39 complete questionnaires. After obtaining the results of the analysis based on the questionnaire, then the authors will go to the stage identification system requirement which includes

analysis of system requirements based on functional and non-functional system.

**4.1.5. Analysis of Knowledge Management Model**

Based on problem identification, and result of data collecting from interview method, questioner and user requirement, then at this stage the writer will make a model of kms that can be developed in PT Surya Sudeco (rent rent). The author provides an extension of the SECI model developed by Nonaka with 4 criteria each having derivatives from the sharing and learning process, can be seen from the following figure:



**Figure 1 Expansion of SECI Model**

KMS model is needed to understand how far the prototype will be developed. From the extensions and extensions of the proposed SECI Model and KMS process analysis, the author then creates a KMS model to be applied in the research object as follows.

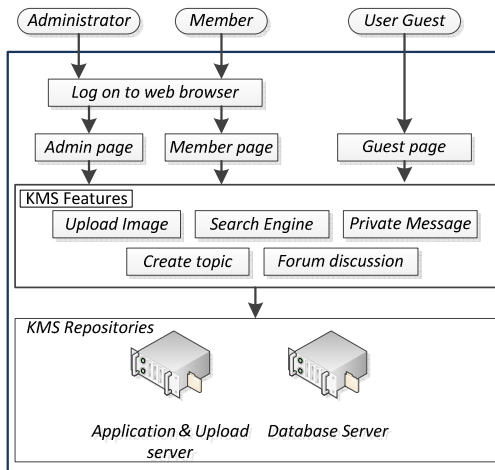


Figure 2 KMS Model in PT Surya Sudeco

4.2. System Requirement Identification

4.2.1. System Requirement Analysis

At this stage, the author will use the UML modeling approach (Unified Modeling Language). With this analysis, find the data domains or information, functions, processes or procedures required.

4.2.1.1. Functional Requirement

Based on the results of previous stages related to the system requirement, then to represent the functional requirements in UML can use usecase diagram.

Based on the built prototype model, the functional requirement can be illustrated through the following usecase:

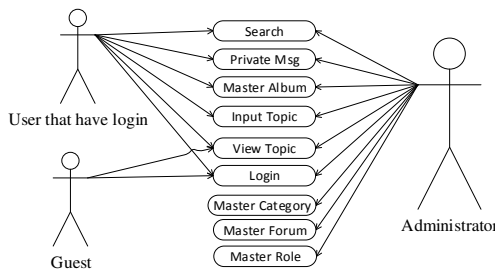


Figure 3 Use Case Diagram

4.2.1.2. Non Functional Requirement

1. Operational Requirement

This prototype can be operated on any operating system that has a web browser minimum update last in 2015 and does not exceed 5 years thereafter, as long as connected PT Surya Sudeco network. And the high demand for access in mobile when viewed from the results of the

questionnaire, then KMS is planned to support mobile web.

2. Security Requirement

This prototype is accessed using user login and password. Only users who are members of PT Surya Sudeco network can access this application. And to be able to add knowledge to the system, only successful login users who can access to update and add knowledge on the system, besides that, will be limited to read only

3. Performance

The prototype can hold a lot of content and is not slow when accessed simultaneously while the location of the server and the client is in a local area location.

4. User friendly

The prototype should be easy and convenient to use, as it attracts users to interact with the system.

5. User Interface:

The prototype is made with an updated and responsive web model.

6. User Manual:

The system is planned to have a guide to make it easier for users to use the system.

4.3. Testing the Prototype of KMS

4.3.1. Software Acceptance

The author conducts checks in internal IT assisted by IT staff to minimize deficiencies and errors. Then do the process of UAT (User Acceptance Test) by testing in each department and record the results through the UAT form. This user testing is limited to PT Surya Sudeco Head Office.

4.3.2. Summary of Software Acceptance Testing Result

To see the results of the test as a whole, can be seen in the following table:

Table 3 UAT Measurement Standart

	Percentage	Explanation
A	91 - 100	Very In accordance with the chill
B	71 - 90	Appropriate, with little to add
C	51 - 70	Quite appropriate, with some to add
D	31 - 50	Less suitable, with much to add
E	0 - 30	Not Match, everything should be fixed

Tabel IV.3 The system acceptance level according to the overall UAT

Menu	Actual	Additional information from the
login	81%	User not all have user ID
Album	79%	Users still feel slow when opening
input topic	80%	Users are still not used to attach
search	83%	Users feel helped by the search
category	84%	-
Forum	81%	-

Role	85%	-
Private Message	86%	-
Average	82.5%	

Based on the test results, it can be concluded that the acceptance rate of software to support the process of developing KMS prototype has the most deficiencies in the aspect of speed, and the most excess is in terms of usability as needed. Overall the average by the user, the UAT results entered in the criteria as desired by the user with a percentage of 82.5%

## V. CLOSING

### 5.1 CONCLUSIONS

Based on the analysis in this study, the authors can conclude several things, namely:

1. KM needs analysis at PT Surya Sudeco can be answered through KMS approach using SECI method. All done in web-based software.
2. With this research can be known how far the application of knowledge management system at PT Surya Sudeco, and can improve the culture of sharing knowledge in the corporate environment so as to improve the quality and quality of the work produced.
3. The prototype knowledge management system is tested with User Acceptance Test (UAT). Based on the test results, software quality level to support the process of developing KMS prototype as a whole is included in the criteria of good value with the percentage of 82.5%.

### 5.2 Recommendation

1. Requires support from all parties to support the implementation process of this knowledge management system in the company.
2. With the new system in the company, it will take 1 or several people who support this system to keep going. Like the process of maintenance and backup.
3. Required optimization of the code and network, so as to produce a fast output.

### 5.3 Future Research

The author is aware with the writing of KMS at PT Surya Sudeco Rental Company still have many shortcomings. Some shortcomings that writers encounter when UAT process is, this system runs fast if in use on localhost, but when tried to use the network, the system is rather heavy.

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