TUGAS AKHIR - TI 141501

IDENTIFIKASI PENGETAHUAN KRITIS UNTUK KESIAPAN IMPLEMENTASI MANAJEMEN PENGETAHUAN PADA PT. PETROKIMIA GRESIK

ALDILAH RIFNA GHAISANI
NRP 2511 100 111

Pembimbing
Dr. Ir. Bambang Syairudin, M.T.

JURUSAN TEKNIK INDUSTRI
Fakultas Teknologi Industri
Institut Teknologi Sepuluh Nopember
Surabaya
2015

FINAL PROJECT - TI 141501

IDENTIFYING CRITICAL KNOWLEDGE FOR KM IMPLEMENTATION READINESS IN PT. PETROKIMIA GRESIK

ALDILAH RIFNA GHAISANI

NRP 2511 100 111

Supervisor

Dr. Ir. Bambang Syairudin, M.T.

INDUSTRIAL ENGINEERING DEPARTMENT

Faculty of Industrial Technology

Institut Teknologi Sepuluh Nopember

Surabaya

2015

APPROVAL SHEET

IDENTIFYING CRITICAL KNOWLEDGE FOR KM IMPLEMENTATION READINESS IN PT. PETROKIMIA GRESIK

FINAL PROJECT

Submitted to Acquire the Requirement of Bachelor Degree:

Industrial EngineeringDepartment

Faculty of Industrial Technology

Institut Teknologi Sepuluh Nopember

Surabaya

Author:

ALDILAH RIFNA GHAISANI
NRP. 2511 100 111

Approved by Final Project Supervisor

Supervisor

Dr. Ir. Bambang Syairudin, M.T.
NIP. 196310081990021001

SURABAYA
2015

IDENTIFIKASI PENGETAHUAN KRITIS UNTUK KESIAPAN IMPLEMENTASI MANAJEMEN PENGETAHUAN PADA PT. PETROKIMIA GRESIK

Nama   : Aldilah Rifna Ghaisani
NRP   : 2511 100 111
Jurusan   : Industrial Engineering
Prmbimbing   : Dr. Ir. Bambang Syairudin, M.T.

ABSTRACT

Dewasa ini pengetahuan menjadi hal mendasar untuk kehidupan perusahaan, baik perusahaan nasional maupun internasional. Menilik pada beberapa penelitian, pengetahuan menjadi hal yang penting bagi perusahaan karena pengetahuan mengandung aset perusahaan yang tidak mudah untuk ditacitkan. Beberapa perusahaan mencoba untuk membangun sistem manajemen pengetahuan mereka sebaik mungkin. Salah satu kegiatan penting dalam sistem manajemen pengetahuan adalah dengan mengidentifikasi pengetahuan kritis yang muncul di perusahaan terkait. PT. Petrokimia Gresik memiliki divisi yang dinamakan Divisi KM (*Knowledge Management*). Ada 5 tahap penting yang menjadi dasar untuk kegiatan divisi ini. Salah satunya adalah memetakan pengetahuan kritis. Oleh karena itu, untuk menentukan pengetahuan kritis, aktivitas yang terjadi di perusahaan tersebut harus bisa diidentifikasi. Untuk mengetahui aktivitas yang ada, penulis melakukan beberapa wawancara dan *brainstorming* dengan para ahli dalam unit terkait. Setelah semua pengetahuan teridentifikasi, langkah berikutnya adalah melakukan penilaian terhadap pengetahuan tersebut dengan menggunakan beberapa kriteria terpilih. Dengan demikian semua pengetahuan kritis dapat divalidasi menggunakan OMAX.

Kata kunci: Pengetahuan, Pengetahuan Kritis, Kriteria, OMAX

IDENTIFYING CRITICAL KNOWLEDGE FOR KM IMPLEMENTATION IN PT. PETROKIMIA GRESIK

Name	:	Aldilah Rifna Ghaisani
Student ID	:	2511 100 111
Department	:	Industrial Engineering
Supervisor	:	Dr. Ir. Bambang Syairudin, M.T.

ABSTRACT

Nowadays, knowledge becomes fundamental to organizational life, both national and international companies. Related to many studies, knowledge becomes important for company because knowledge contain an assest of company which is not easily to be captured. Many organization try to build the knowledge management system as well as the company can. One of the knowledge management system building activity is by identifying the critical knowledge appear in related company. PT. Petrokimia Gresik has a part of division called as Divisi KM (Knowledge Management). There are 5 important phases which became the basic for KM activity in PT. Petrokimia Gresik. One of the important ones is map the critical knowledge. Therefore, to determine the critical knowledge, the activity happens has to be identified. To capture the activity, author do some interview and brainstorming with the expert in the related unit focus. After all knowledge captured, the next step is assessment activity using some selected criteria. Thus all the critical knowledge ide ntified has to be validate using OMAX.

Keywords: *Knowledge, Critical Knowledge, Criteria, OMAX*

ACKNOWLEDGEMENTS

5. Murni Ukhuah Islami, S.Kg and Shofiyah Rizka, S.M. –my long distance therapists. Best partners for 6 years and ahead. Thanks for being my unbiological sister.

6. Nindya Agustin Widiastuti, S.T. and Linggar Asa Baranti, S.T. best partner since my very first college's life. You two guys like an octopus on my face. If anybody breaks your heart, tell me. I will break her/his face.

7. My best *rumpis* partner in Bumi Perumahan Randuagung, Monica Aya Maulida, a part of Minah Family. Thanks for being around me in the hardest part of my college life.

8. My truly life's treasures, 2nd generation of Acceleration Class of SMA Negeri I Gresik. You know, all of you have my unconditional love. We are like a really small gang. "CS Foundation", make it come true!

9. All member of Beswan Djarum 29 Surabaya, my friends with the same mental disorder. "*Apa kabar Beswan Djarum hari ini?*" I heart you all guys. We're rocking! See you again in a better moment. Keep *Fulltilt!*

10. Class of International. We've been through this 4 years with all unnamed emotion. For all the pain and joy, please, say welcome to the real jungle.

11. Kabinet BMKarya. Thanks for supporting me in unneeded situation, whether it is improve my mood or not. Especially for PSDM members. We knew, we never in the same line. I am sorry for all mistake I've ever done.

12. AEC Project Group: Ananda "tante" Rizka, Kuntoro "the kompor" Suhardi, Rahardian "shiro the purs" Y.K., and Aisyah "the cingkir" D.M. thanks for being around me for 1 years left, our rough phase has been complete. Say hello to AEC in the end of this year. We've done our best!

13. Sismanity sisterhood -Inesia Dwi Qur'aini, S.T.; Feny Rachmawati, S.T.; Mami Bahalwan Apriyansyah, S.T. Thanks for all the long night we've been through together. For the song we sang and the pillow we shared. Have a better life then!

14. Anti wacana group: Andrew, Andy, Naufal, Risa, Zizah, Juju, Sindi, Mamat. You are very annoying but it is the way you are. Thanks for realizing me that I am not alone. And also Mas Humaam, my report editor, thanks for your kindness.
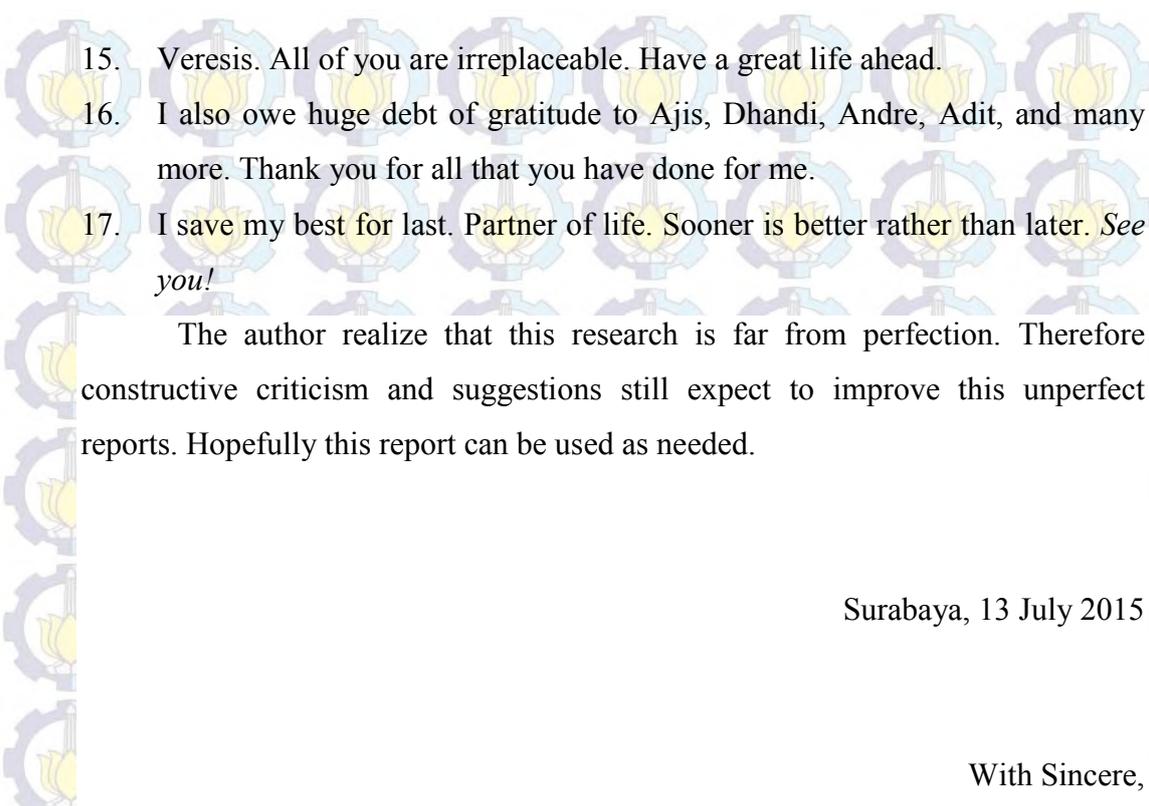
15. Veresis. All of you are irreplaceable. Have a great life ahead.
16. I also owe huge debt of gratitude to Ajis, Dhandi, Andre, Adit, and many more. Thank you for all that you have done for me.
17. I save my best for last. Partner of life. Sooner is better rather than later. *See you!*

The author realize that this research is far from perfection. Therefore constructive criticism and suggestions still expect to improve this unperfect reports. Hopefully this report can be used as needed.
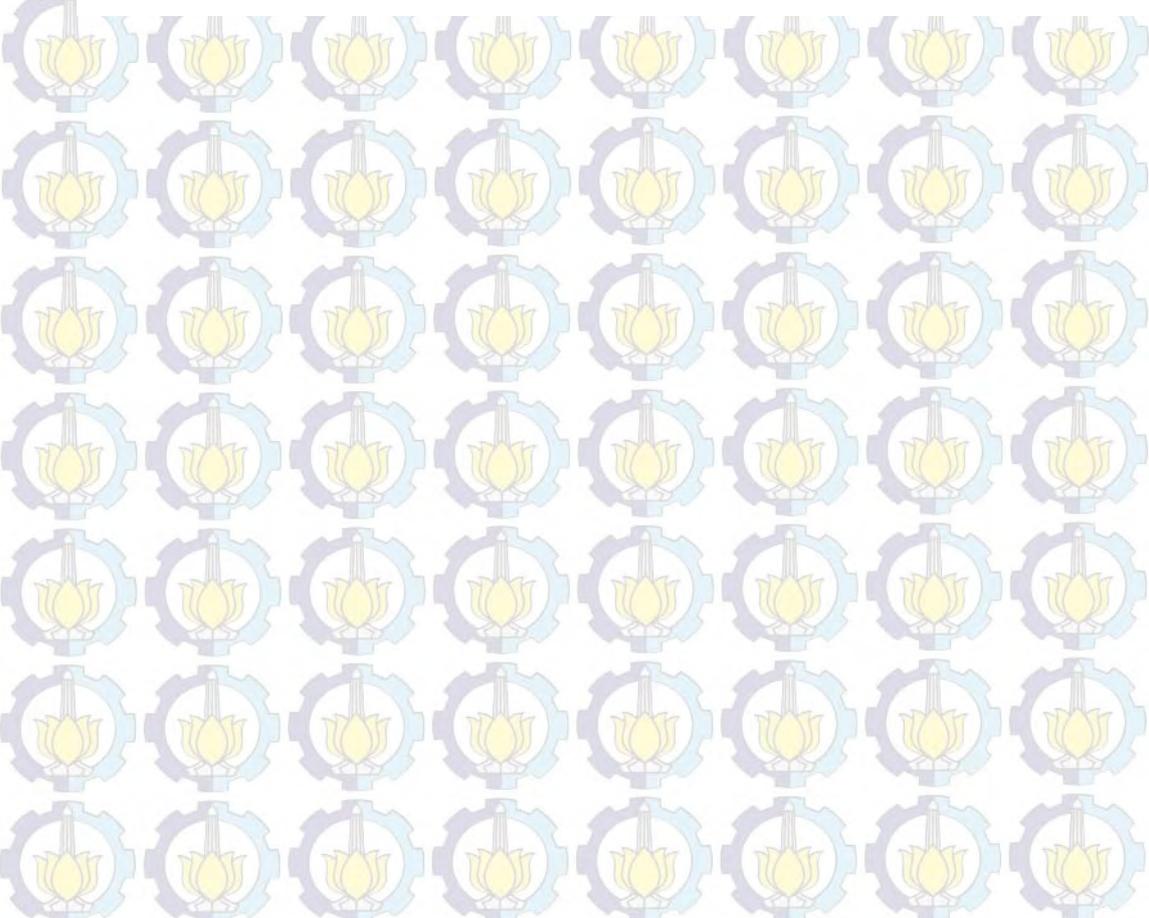
Surabaya, 13 July 2015

With Sincere,

Author

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ENCLOSURE

CHAPTER 1
INTRODUCTION

This chapter explains the fundamental reason regarding research. Chapter 1 introduces about background, problem formulation, research objective, boundaries and assumptions, research benefit, and thesis outlines for the report.

1.1 Background

Knowledge becomes fundamental to organizational life today, both national and international companies. Ali (2006) stated that knowledge is axiomtic for many organizations that knowledge management is a cornerstone for the company's success. Related to many studies, knowledge becomes important for company because knowledge contain an assest of company which is not easily to be captured. For those reason, knowledge become a critical point for company's asset.

Nowdays, many organization try to build the knowledge management system as well as the company can. One of the contribution is by using professional service. One of the professional service called as Dunamis.

Dunamis Organizational Service is a professional service firms with a mission to "enable greatness in people and organizations everywhere". Since 1992, Dunamis Organizational Service becomes a licensee partner of Franklin Covey Co. and a licensee partner of VitalSmarts in 2012. Dunamis Organizational Service handles a cross section of multinational, national and government institutions across the country. Dunamis Organizational Service is also a licensee partner of Harrison Assessment, Most Admired Knowledge Enterprise (MAKE) Study by Teleos, HC Plus and Facet5 in Indonesia (Dunamis Organizational Service, 2015).

To achieve the target, an enterprise must find ways to manage their knowledge. One quite powerful way is through knowledge management. To develop knowledge management activities in Indonesia, Dunamis Organizational Service collaborates with the Teleos develop MAKE (Most Admired Knowledge

Enterprise) Study since 2005. MAKE study conducted in order to assess the enterprises' activity, companies or organization, in the field of Knowledge Management and Intellectual Capital.

In 2014, there were 54 enterprises which nominated as "2014 Indonesian MAKE Study". 2014 Indonesian MAKE Study is made with the aim of assessing the enterprises in ASEAN Free Trade preparation in order to face Asian Economic Community at the end of 2015. Seventeen enterprises that meet the 8 criterions of MAKE Study are selected as a "2014 Indonesian MAKE Study" finalists.

Table 0.1 2014 Indonesian MAKE Finalists

1	BINUS University	7	PT. GMF Aerosia	13	PT. Tiga Raksa Satria Tbk.
2	PT. Adi Sarana Armada Tbk.	8	PT. Pertamina (Persero)	14	PT. Tower Bersama Infrastructure Tbk.
3	PT. Adira Dinamika Multi Finance Tbk.	9	PT. Pupuk Petrokimia Gresik	15	PT. Toyota Astra Motor
4	PT. Astra Honda Motor	10	PT. Rekayasa Industri	16	PT. Unilever Indonesia Tbk.
5	PT. Bank Negara Indonesia (Persero Tbk.	11	PT. Sumberdaya Sewatama	17	PT. United Tractors Tbk.
6	PT. Bank Syariah Mandiri	12	PT. Telekomunikasi Indonesia Tbk.		

Source: Dunamis Organizational Service, 2015

Eight criterions which are used as a base of Dunamis assessment in 2014 Indonesia MAKE Study is:

1) Creating an enterprise knowledge-driven culture

2) Developing knowledge workers through senior management leadership

3) Delivering knowledge-based products/services/solutions

4) Maximizing enterprise intellectual capital

5) Creating an environment for collaborative knowledge sharing

6) Creating a learning organization

7) Delivering value based on customer knowledge

8) Transforming enterprise knowledge into shareholder value

The assessment of the 2014 Indonesian MAKE Study finalists is made by the panelist with the range of score from 0-100 for each criterion.
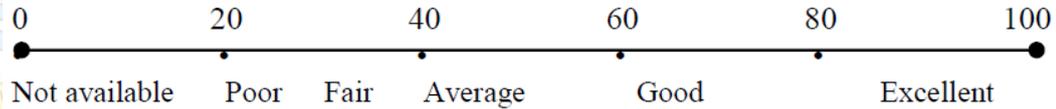
Figure 0.1 The Range of Score in 2014 Indonesian MAKE Study Assessment (PT. Petrokimia Gresik, 2014)

The total maximum score for 8 criterions is 800. There are 9 enterprises who won in this competition.

Table 0.2 The Winner of 2014 Indonesian MAKE

Rank	Enterprise	Score
1	PT. Pertamina (Persero)	640.5
2	PT. United Tractors Tbk.	630
3	BINUS University	615.3
4	PT. Telekomunikasi Indonesia Tbk.	612.7
5	PT. Astra Honda Motor	610
6	PT. Rekayasa Industri	593.3
7	PT. Tiga Raksa Satria Tbk.	587.6
8	PT. Adira Dinamika Multi Finance Tbk.	579.9
9	PT. Bank Negara Indonesia (Persero Tbk.	577

Source: PT. Petrokimia Gresik, 2014

In this competition, PT. Petrokimia Gresik's score is 543.5 with the score for each criterion show in figure 1.2.
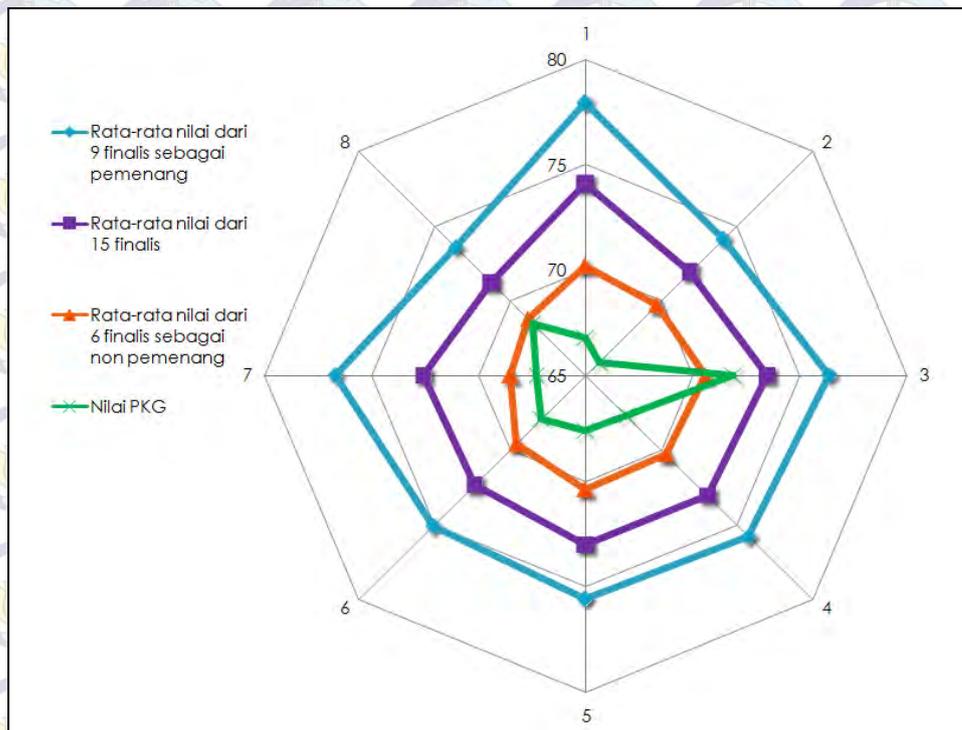
Figure 0.2 PT. Petrokimia Gresik's Score Position for Each Criterion (PT. Petrokimia Gresik, 2014)

Figure 1.2 shown the second criterion (developing knowledge workers through senior management leadership) has the lowest score than others. From thus condition, PT. Petrokimia Gresik is given some advice by 2014 Indonesian MAKE Study panelists to improve its performance. According to the result conducted by Dunamis Organizational Service, PT. Petrokimia Gresik has several opportunities in the KM's activities development as shown in table 1.3.

PT. Petrokimia Gresik has a part of division called as Divisi KM (Knowledge Management). Divisi KM established in 2008 and still in the developing stage. Knowledge Management strategy applied in Divisi KM is still in the development stage too. There are 5 important phases which became the basic for KM activity in PT. Petrokimia Gresik:

Table 0.3 Recommendations from Dunamis in 2014 Indonesian MAKE Study

Development Opportunities of PKG's Knowledge Management	
1	Design the strategy of knowledge culture formation of PT. Petrokimia Gresik
2	Enhancement senior management leadership in knowledge worker developing process
3	Development of COP (Community of Practice) program or sharing activity which is involve leader of senior management
4	Development of learning organizational culture besides training and workshop such as Project Retrospective
5	Development determination system and search expertise
6	Design capturing knowledge program from expertise and employee who will be facing the retirement to enrich company's intellectual capital
7	Redesign portal KM interface become more attractive and appropriate
8	Align the KM activity with employee's career path

Source: PT. Petrokimia Gresik, 2014

Figure 0.3 PT. Petrokimia Gresik's Knowledge Strategy (PT. Petrokimia Gresik, 2014)

PT. Petrokimia Gresik is still trying to develop a second phase of KM strategy namely "Map the critical knowledge". According to KM's manager, the activity is still too general. There is no distinction among the knowledge, which one the knowledge greatly needed and which ones can be ignored.

Moreover by looking at the employees' condition, there are a massive number of employees who will be facing the retirement period (42.5%). Thus, it is important to capture the employee's knowledge that is not owned by other

employees. This is can be done through senior management leadership roles in order to enrich the knowledge worker.

Table 0.4 Number of Employee based on Age

Group of Age	Number of Employee	Percentage
>55	164	4.9%
50-54	1418	42.5%
45-49	1165	34.9%
40-44	62	1.9%
35-39	11	0.3%
30-34	21	0.6%
25-29	180	5.4%
20-24	318	9.5%
Total	**3339**	**100.0%**

Source: PT. Petrokimia Gresik, 2014

There is a relationship between the problem identified by 2014 Indonesian MAKE Study panelists and PT. Petrokimia Gresik's strategy focus. Then, both problems have a strong bond which can be identified as problem of mapping critical knowledge through senior management roles in the development of knowledge worker.

Mapping on the critical knowledge requires knowledge mapping tools as an effort to audit the existing knowledge. In addition, AHP is also needed in order to choose criterion of critical knowledge.

1.2   Problem Statement

Based on the elaboration above, this research is aiming to define the flow of critical knowledge in term of knowledge management activity readiness. For the critical knowledge itself, there will be a selected criterion based on company's business strategies.

1.3   Objectives of the Research

The objectives of this research are:

1) To define the critical unit as assessment object
2) To define the criterion for critical knowledge
3) To identify the critical knowledge

1.4   Benefits of the Research

The benefit of this research is to identify the category of knowledge based on the critical knowledge thus the flow of critical knowledge can identify easily and PT. Petrokimia can keep their knowledge.

1.5   Scopes of the Research

The scope of this research consists of boundaries and assumptions.

1.5.1   Boundaries

The boundaries for this research are:

- The object used is PT. Petrokimia Gresik, not included subsidiary or Joint Venture Company.

- The departments used as an object is Departemen Produksi IIA

- Criterion for critical knowledge suggested is based on in-depth interviews and brainstorming between company's employees and author.

- The time period in data collecting is started from April 2015 until May 2015.

1.5.2   Assumptions

The assumptions for this research are:

- There is no changing in company's structure organization and company's strategic business

- There is no increasing or decreasing of employee in related department used as data collecting

- There is no changing in business process of Departemen Produksi IIA

1.6   Report Structure

This subchapter will introduce about writing systematic used in this research. Here is the thesis outlines.

- CHAPTER 1 INTRODUCTION

    This chapter will explain the research background, problem formulation, objectives of research, benefits of research and scope of research which is consisted of boundaries and assumptions

- CHAPTER 2 LITERATURE REVIEW

    The literature used is about knowledge, knowledge assets, knowledge management, knowledge management audit, knowledge mapping, knowledge asset map, questionnaire, AHP, Dunamis, and preceding researches. By using the study of literature, author is expected to have strong guidance in resolving the problems faced and able to achieve the research objectives.

- CHAPTER 3 RESEARCH'S METHODOLOGY

    This chapter will explain about the steps used in research. The steps which are explained in methodology will be used as guidance in doing research systematically, thus the objectives of research could be achieved.

- CHAPTER 4 COLLECTING AND PROCESSING DATA

    This chapter will explain about how to collect and process the data in order to solve the problems formulated and achieve the research objectives.

- CHAPTER 5 ANALYSIS AND INTERPRETATION DATA

    This fifth chapter will explain about the analysis of the data processing and data interpretation to obtain an appropriate solution.

- CHAPTER 6 CONCLUSIONS AND RECOMMENDATION

    This chapter describes the conclusion of the research that has been conducted in accordance with the purpose of research. In addition, suggestions and recommendations will be given to improve of PT. Petrokimia Gresik performance.

CHAPTER 2
LITERATURE REVIEW

This chapter will explain the basic theory that used in this research. The concepts and theories provided in this chapter are knowledge, knowledge assets, knowledge management, knowledge management audit, knowledge mapping, knowledge asset map, questionnaire, AHP, Dunamis, and preceding researches.

2.1   Knowledge

Knowledge is a basic thing exists in human life. The level of knowledge between one people to another is different. People seek knowledge because it helps them succeed in their work. Tiwana (Awad, 2004) views that knowledge as actionable (relevant) information available in the right format, at the right time, and at the right place for decision making.

The definition of knowledge is very much depends on content. Liebowitz and Wilcox (Awad, 2004) said knowledge as the whole set of insight, experience, and procedures that are considered correct and true and that, therefore, guide the thoughts, behavior, and communication people. Thomas Davenport and Laurence (Awad, 2004) postulated that knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experience and information. It originates and is applied in the minds of knowers. In organizations, it often become embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.

There are two types of knowledge: explicit knowledge and tacit knowledge. Explicit knowledge can be documented, illustrated and sysbolized. Whereas tacit knowledge is in individuals' minds and hard to express or documented. Th other classification of knowledge consists of 3 categories (Balaid, 2005-2006):

- Descriptive knowledge (know-what), also preferred to as declarative, provides a description of an object, situations and facts or methods

- Procedural knowledge (know-how) specifies doing something, actions or manipulations. In general procedural knowledge describes a method or behavior
- Strategic knowledge (know-why, know-when) is the category form which the decision process benefits the most

2.2 Knowledge Assets

Knowledge assets represent the foundation of a company's capabilities. Capabilities in turn determine the performance of the processes necessary to execute a company's strategy (Marr, 2002). Knowledge assets consist of guidelines, set within business context, enlivened by stories and quotes from experience and linked to people and documents for further investigation (Knoco, 2008). There are 4 categories of knowledge assets:

Experiential knowledge assets	Conceptual knowledge assets
Tacit knowledge shared through common experiences • Skills and know-how of individuals • Care, love, trust, and security • Energy, passion, and tension	Explicit knowledge articulated through images, symbols, and language • Product concepts • Design • Brand equity
Routine knowledge assets	Systemic knowledge assets
Tacit knowledge routinized and embedded in actions and practices • Know-how in daily operations • Organizational routines • Organizational culture	Systemized and packaged explicit knowledge • Documents, specifications, manuals • Database • Patents and licenses

Figure 2. 1 Categories of Knowledge Assets (Naftanaila, 2012)

2.3 Knowledge Management

Knowledge management is a multidisciplinary field of study that covers a lot of ground. Knowledge management draws upon a vast number of diverse fields such as (Dalkir, 2005):

- Organizational science
- Cognitive science
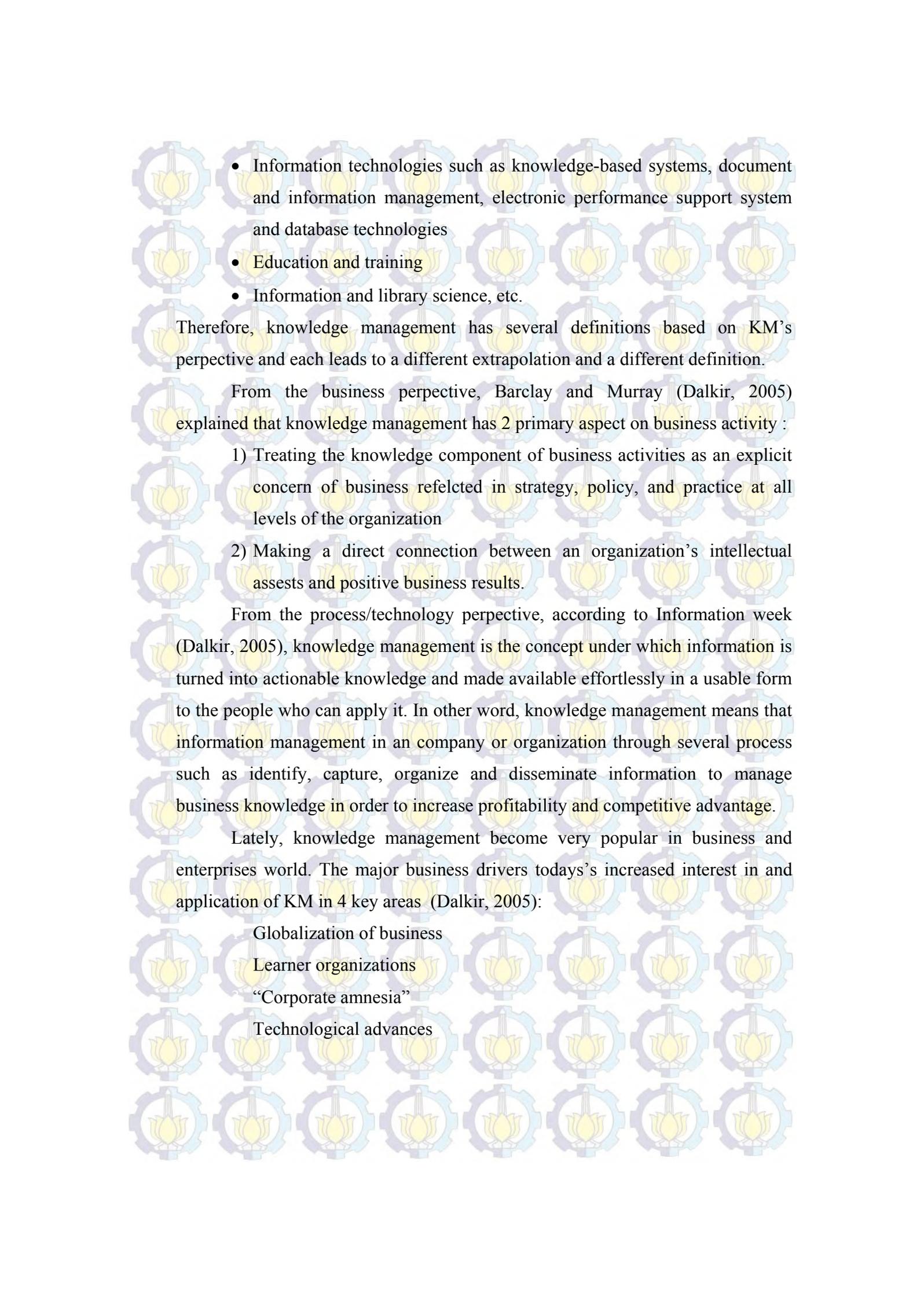
- Information technologies such as knowledge-based systems, document and information management, electronic performance support system and database technologies
- Education and training
- Information and library science, etc.

Therefore, knowledge management has several definitions based on KM's perpective and each leads to a different extrapolation and a different definition.

From the business perpective, Barclay and Murray (Dalkir, 2005) explained that knowledge management has 2 primary aspect on business activity :

1) Treating the knowledge component of business activities as an explicit concern of business refelcted in strategy, policy, and practice at all levels of the organization

2) Making a direct connection between an organization's intellectual assests and positive business results.

From the process/technology perpective, according to Information week (Dalkir, 2005), knowledge management is the concept under which information is turned into actionable knowledge and made available effortlessly in a usable form to the people who can apply it. In other word, knowledge management means that information management in an company or organization through several process such as identify, capture, organize and disseminate information to manage business knowledge in order to increase profitability and competitive advantage.

Lately, knowledge management become very popular in business and enterprises world. The major business drivers todays's increased interest in and application of KM in 4 key areas (Dalkir, 2005):

Globalization of business

Learner organizations

"Corporate amnesia"

Technological advances

2.3.1 Knowledge Management Framework

Nonaka and Takeuchi (Tiwana, 1999) explained that the creation of knowledge is the key to long term success for the company. Here is a model of knowledge conversion or often called as framework of Nonaka and Takeuchi.
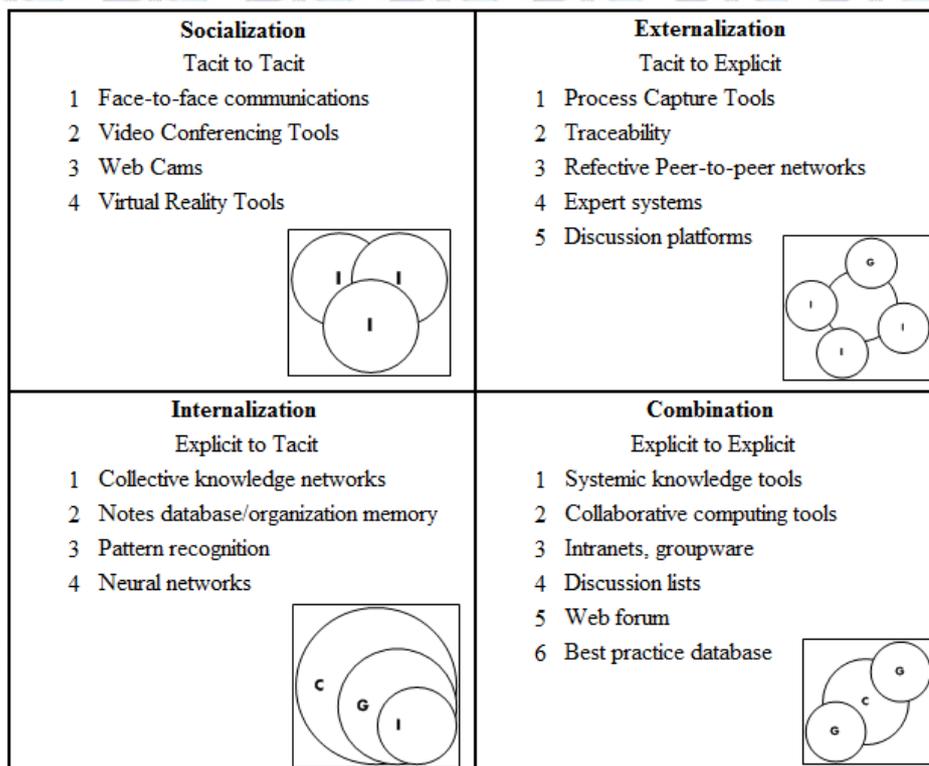
Figure 2. 2 Nonaka's SECI Model (Tiwana, 1999)

The interaction of knowledge at enterprise-wide (company) levels is indicated by C, at group or task team level indicated by G and at individual level by I. the corresponding technology enablers are exemplified in each quadrant. Knowledge management is done according to the SECI model through a cycle of socialization, externalization, combination and internalization of knowledge. Figure 2.2 illustrates how each of these phases is supporting each others. Every stages of knowledge management framework has different ways on knowledge captured.

2.3.2 Knowledge Management Cycle

Effective knowledge management requires an organization to identify, generate, acquire, diffuse and capture the benefits if knowledge that provide a strategic advantage to organization. A clear distinction must be made between information and assets knowledge. A knowledge information cycle can be envisaged as the route information in order to become transformed into a valuable strategic asset for the organization via a knowledge management cycle. These are 4 models of knowledge management cycle.

Table 2.2.1 Models of Knowledge Management Cycle

A Comparison of Key KM Cycle Processes					
Nickols (1999)	Wig (1993)	McElroy (1999)	Rollet (2003)	Bukowitz & Williams (2003)	Zack (1996)
Acquisition	Creation	Individual and group learning	Planning	Get	Acquisition
Organization	Sourcing	Knowledge claim validation	Creating	Use	Refinement
Specialization	Compilation	Information acquisition	Integrating	Learn	Store/retrieve
Store/access	Transformation	Knowledge validation	Organizing	Contribution	Distribution
Retrieve	Dissemination	Knowledge integration	Transferring	Assess	Presentation
Distribution	Application		Maintaining	Build/sustain	
Conservation	Value realization		Assessing	Divest	
Disposal					

Source: Dalkir, 2005

2.4 Knowledge Management Audit

Knowledge audits play a critical role in establishing contextual relevancy for any activity that has play in the knowledge management/ knowledge leveraging arena of an organization (Moulton, 2008). A knowledge audit helps to

identify knowledge management needs, strengths, growth areas and risks in the company. The assessment's focus is to identify key knowledge areas and to assess whether they are being effectively captured or not. Knowledge audits can be conducted through a variety of means, including surveys, process maps, structured interviews and analyzing competencies. The objectives of knowledge audit are:

- To show knowledge structure which appears in every part of organization

- To provide a knowledge data as an input for organizational planning strategy process

- To identify and estimate the number of knowledge repositories which is already appeared and will be appear in organization

According to Syairudin (2015), questionnaire can be used as a tool of knowledge audit to explore data knowledge that is by asking the following questions:

- Business concept
  - ✓ How do you conceptualize the business?
  - ✓ What is the mission or objective of your team or unit?

- Enterprise know-how
  - ✓ How dependent are you on knowledge and expertise?
  - ✓ How do you generate knowledge?
  - ✓ Please describe various methods in which you codify knowledge (e.g. knowledge maps of who knows what), printed sources (rule books), experience databases (repository of customer problems and actions)
  - ✓ Do you codify knowledge related to both successful and failure experiences?
  - ✓ What mechanisms exist to transfer knowledge from expert people/teams to other people/teams (e.g. training, informal talks, etc.)?

- Knowledge workers
  - ✓ Are they focused on what they are best at?

- ✓ What kind of partnership exists between management and knowledge workers?
- ✓ How do you use training and team processes to enhance knowledge/skills?
- ✓ How is compensation linked with knowledge/skill levels?
- Knowledge mediated through IT
  - ✓ Is IT used just to process data or also to manage knowledge?
  - ✓ How do you implement your IS projects related to knowledge management?
- Organizational design
  - ✓ Does the flow of information in your unit foster or hinder innovation?
  - ✓ How close are you to being a modern networked, flat, and adaptable organization?

Knowledge audit has 4 important components which has to be considered on knowledge audit implementation:

Figure 2.2.1 Knowledge Audit Components (Universiti Teknologi Malaysia, 2008)

After determined the knowledge gap, the location of the knowledge (Knowledge Inventory) as well as the knowledge owner and user are identified. Knowledge Flow is the relationship between the knowledge owner and knowledge user. The Knowledge Map is a navigation aid to view the connection between

Knowledge Resources, Knowledge Inventory and Knowledge Flows in order to scrutiny clearly the relationship between them. On the other hand, the barriers to acquire the knowledge need to be investigated earlier so that the organization can find the solution of the problem before time.

To conduct an audit of the K-Needs Analysis to K-Mapping needed tools that simplifies the search of each of these components. Here are some tools that can be used by auditors to audit knowledge (Syairudin, 2015):

1) Walkthroughs; tool to keep track of documents, transaction or activity through the search process from the beginning to the end of the activity in order to obtain a complete understanding of the activity

2) Flow charts

3) Input–output models

4) Questionnaire-based knowledge surveys: used to obtain a broad picture of the knowledge's status

5) Middle management target group sessions: used to identify the condition of knowledge

6) Task environment analysis: used to understand the details of knowledge and the role of knowledge for the organization

7) Verbal protocol analysis: used to identify the elements that build knowledge structures

8) Basic knowledge analysis: used to identify aggregate and detail of knowledge

9) Knowledge mapping: used to map the hierarchy and network of knowledge

10) Critical knowledge function analysis: used to determine the critical value

11) Knowledge use and requirements analysis: used to identify how a business process knowledge for the organization's purpose and to determine its needs

12) Knowledge scripting and profiling: used to identify the profile of the employment relationship / job with the supported knowledge

13)   Knowledge flow analysis: used to analyze the knowledge exchange, input assignments, and the amount of knowledge loss

2.5   Knowledge Mapping

Trochim (Kim, 2005-2006) postulated that concept mapping is a type of structured conceptualization used by groups to develop a conceptual framework which can guide evaluation or planning. Trochim consider concept mapping as a structured process, focused on a topic or construct of interest, involving input from one or more participants, that produces a pictorial view of their ideas and concepts and how these are interrelated.

According to the Organization for Economic Cooperation and Development (OECD) (Balaid, 2005-2006), knowledge can be classified as know-what, know-why, know-how and know-who. The most important responsibilities of knowledge management are to envisage knowledge for knowledge seekers. Knowledge mapping is one way that allows knowledge to be represented graphically through nodes to represent main ideas and links leading to representing the relationships between the ideas.

T.N. Ling et al (Balaid, 2005-2006) said that knowledge map is defined as a method to retrieve the knowledge that is arranged via knowledge experts. Another description for the knowledge map is the geographical view of knowledge inside am organization illustrating the owner, location, and value using method of organizational knowledge. T. Davenport and L. Prusak (Balaid, 2005-2006) said "Knowledge maps are guides, not repositories.

Knowledge map gives a holistic overview of knowledge resources. Therefore, it determines and clarifies the needed knowledge to achieve strategic goals in a more simple and friendly manner. Information presented in the knowledge map helps directors to observe issues and discover risks.

2.5.1   Knowledge Mapping Classification

Knowledge map classification gives a general idea of the issue. It also helps to find the suitable problem solving method among the potential mapping

techniques. The classification adapted from M.J. Eppler (Balaid, 2005-2006) is the following questions:

- What is our purpose of creating a knowledge map? ("why" question)
- Who is going to use the map, in what situation and which phase? ("when" and "to whom" questions)
- Which domain of knowledge is in the focus? ("what" question)
- Which graphical method is preferred who is to construct it? ("how" question)
- Where the firm's knowledge is rooted and expected to produce? ("where" question)

2.5.2 Knowledge Mapping's Objects

Object of knowledge can be text of hypertext to achieve explicit knowledge. Thus, explicit knowledge exists generally in hypertext on the Web or texts on the Intranet which we view them as document. The following table illustrates the most important objects that can be mapped (Balaid, 2005-2006):

Table 2.2.2 Objects can be Mapped

Type of Knowledge	Objects
Explicit Knowledge	Subject, purpose
	Location
	Format
	Ownership
	Users
	Access right
Tacit Knowledge	Expertise, skill, experience
	Location, accessibility, contact address
	Relationships/networks
Tacit organizational process knowledge	The people worth the internal processing knowledge
Explicit organizational process knowledge	Codified organizational process knowledge

Source: Balaid, 2005-2006

2.5.3 Knowledge Mapping Methods

Knowledge mapping method can be categorized into 2 approaches (Ermine, Boughzala, & Tounkara, 2006):

- A "Process" oriented approach

  This approach deals with knowledge mapping methods which use modeling, description and analysis of business processes to determine critical knowledge.

- A "Domain" oriented approach

  In this approach, Ermine, Boughzala, & Tounkara (2006) try to make an analysis from a mass of information in order to organize it in logic different from the functional approach. In fact, the goal is to ignore the functional structure of the firm, grouping activities into knowledge domains. This task demands an important capacity of analysis because it is not a natural process.

2.5.4   Knowledge Mapping Techniques

Ali Saleh S. Balaid (2006) explores several techniques of knowledge representation and suggests a roadmap with concrete procedures to build the knowledge map. In this table, the techniques were examined based on the classification of knowledge mapping.

Table 2.2.3 Knowledge Mapping Technique

No	Knowledge Technique	Description	Know what	Know how	Know why
1	Mind Map	Mind maps consist of a network of concepts in relation with each other. Its main help is in memory retention and organize ideas in relation together	Yes	Yes	Yes

Table 2.2.3 Knowledge Mapping Technique (cont')

No	Knowledge Technique	Description	Know what	Know how	Know why
2	Concept Maps	Concept map is a structured way to help groups to develop conceptual frameworks used in planning or evaluation. Concept mapping is different with mind mapping and not to be confused thus it is more formal and structured. Starting from a question or phrase, in a 'tree' structured hierarchy ideas lay in layers (primary, secondary, and tertiary ideas)	Yes	Yes	Yes
3	Argument Maps	Invented by J.H. Wigmore around 2000, this map is considered relatively new to help in the analysis of legal arguments. This class of techniques decomposes an argument into claims, reasons and objections. It is also used for preparing and presenting arguments and for developing critical thinking skills, both individually and collectively.	Yes	No	No

Table 2.2.3 Knowledge Mapping Technique (cont')

No	Knowledge Technique	Description	Know what	Know how	Know why
4	Causal Maps	Causal maps represent the cause-effect relations between experts' opinion in a directed graph. There are many diagrams known as causal map like Ishikawa (fishbone) diagram or cause and effect diagrams that are used to help teachers or student.	Yes	Yes	Yes
5	Knowledge Asset Map	It consist of mechanisms enabling organizations to identify their knowledge assets, their inter relations and needed knowledge to fulfill development plans. Provides a framework that allows organizations to identify the critical knowledge areas or their company.	Yes	No	No
6	Social Network Analysis	SNA studies, measures, and maps any knowledge processing element in a network of connected nodes (people, groups, organizations, computers, and est.) and captures the flow of knowledge among them.	Yes	No	No

Table 2.2.3 Knowledge Mapping Technique (cont')

No	Knowledge Technique	Description	Know what	Know how	Know why
7	Topic Map	Topic maps organizes knowledge describes the relations between knowledge domains and link to knowledge resource. It also helps to visualize information routing within organization.	Yes	Yes	Yes
8	Folksonomy	The word is a combination of the words 'folk' and 'taxonomy' to refer to an informal collection of related vocabulary. A way of sorting content on the internet by social tagging; social classification generated by employees reflects the real situations of knowledge understanding.	Yes	No	No
9	Process Knowledge Mapping	Process knowledge mapping identifies current knowledge and needed knowledge in business process. Process knowledge mapping analyzes a business process or method to identify knowledge bottleneck (where), knowledge requirements (what), and how to acquire them (or by who).	Yes	Yes	Yes

Table 2.3 Knowledge Mapping Technique (cont')

No	Knowledge Technique	Description	Know what	Know how	Know why
10	Functional Knowledge	Functional knowledge map provides an organizational directory of knowledge resources; inter relations of personal and their skills.	Yes	Yes	Yes
11	Competency Mapping	Competency mapping represents organizational structure, with jobs descriptions and personnel requirements; it does not reveal the real expertise and individual's knowledge.	Yes	No	No
12	Information Flow Analysis	This type using complex programs investigates formal and informal networks and processes in the enterprises and reports every knowledge resource is used by whom, and how often.	Yes	Yes	Yes
13	Petri Nets	A petri net is a graph with place or transitions as nodes. They are two parted graphs with directed edges and have formal and semantics. It is well known tool for information processing system study.	Yes	Yes	Yes

Table 2.3 Knowledge Mapping Technique (cont')

No	Knowledge Technique	Description	Know what	Know how	Know why
14	Semantic Map	A semantic mapping technique aims to simplify implementation by building precise transforms from canonical message and document structures to 'flattened' formats where readily meaningful business names replace machine-oriented fixed attribute codes in deeply nested structures.	Yes	Yes	No
15	Cognitive Map	This map tries to show how people see their environment and captures their comprehending, learning, or keeping knowledge.	Yes	Yes	Yes

From several knowledge mapping techniques above, the technique selected use in this research is knowledge asset map. This technique is selected because one of the aims is to provide a framework that allows organizations to identify the critical knowledge areas or their company.

2.6   Knowledge Asset Map

Knowledge assets map is proposed to support managers in assessing company's knowledge assets. The knowledge assets map provides a framework which helps to promote understanding of the structure of the company's knowledge assets. It allows the identification and definition of the critical knowledge areas of a company and guides the design of indicators to assess the knowledge capital (Marr, 2002). The knowledge assets map is based on an

interpretation of the company's. The Knowledge Assets Map is based on an interpretation of the company's knowledge assets as the sum of two organizational resources: stakeholder resources and structural resources. Figure 2.4 illustrates the hierarchy of knowledge assets with its sub-classification.
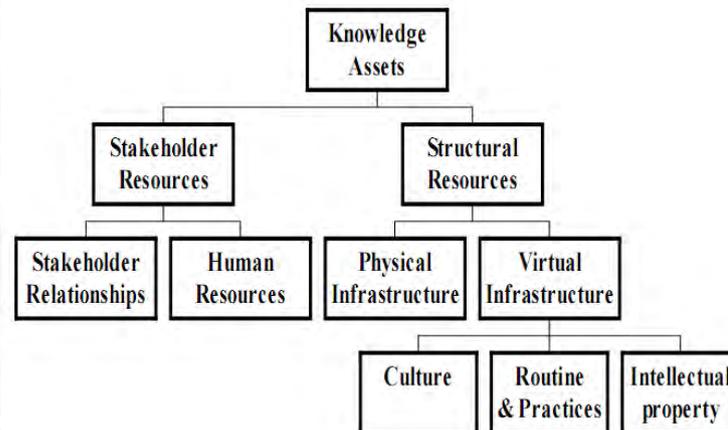
Figure 2.2.2 The Knowledge Assets Map (Marr, 2002)

2.7   Questionnaire

The questionnaire is a list of questions to be answered or done by the respondent who wants to be investigated (Hadi, 2015). This questionnaire is used to determine the respondents to questions. With this questionnaire, respondents will be easy to answer because the alternative answers already provided and require a short time to answer it.

According to Hadi (2015) there are 4 functions of questionnaire:

- To gather information as a basis for the preparation of a permanent record.
- To ensure the validity of the information obtained by other methods.
- Making the program evaluation guidance
- To take sampling attitude / opinion of the respondents

The question of questionnaire can have various forms, such as:

1) Closed Question

Closed questions are questions that form, which in this case the respondent just choose answers that have been provided in the questionnaire. So, the answer has been linked, the respondent cannot give the answer that may be freely desired by the respondent. The form of a questionnaire contains

questions questionnaire so-called closed (closed questionnaire). Usually if the problem has been clear, the use of this questionnaire.

2) Open Question

Open questions are questions that still provide the widest opportunity for respondents to provide greater opportunities for respondents to give an answer or response to an open questionnaire. Usually, when people want to get the opinion will use this questionnaire.

3) Open and Closed Question

Questions of this model are a mixture of two kinds of questions beforehand. In this questionnaire, in addition to the open-ended questions are questions that covered too. Questionnaires these are called open-closed questionnaire (open and closed questionnaire)

Some of the main objectives in making the questionnaire are (Hadi, 2015):

- Obtain data relevant to the purpose of research.
- Obtain data with high reliability and validity as high as possible.

2.8 AHP

Analytical Hierarchy Process (AHP) is an effective tool for dealing with complex decision making, and may aid the decision maker to set priorities and make the best decision (Saaty, 1980). In many industrial engineering applications the final decision is based on the evaluation of a number of alternatives in terms of a number of criteria. The AHP generates a weight for each criterion according to the best decision maker's pairwise comparisons of the criteria. The higher the weight, the more important the corresponding criterion. The overview of AHP process is shown in figure 2.5 below.
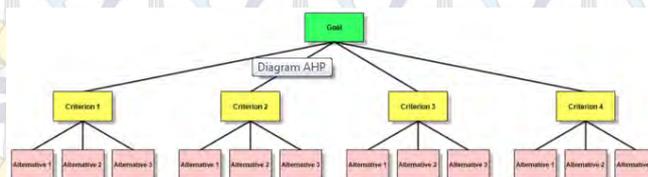
Figure 2.2.3 Linear Hierarchy of AHP (PWK Tech, 2014)

The Analytical Hierarchy Process (AHP) can be implemented in 3 simple consecutive steps:

1) Computing the vector of criteria weights
2) Computing the matrix of options scores
3) Ranking the options

The relative importance between 2 criteria is measured according to a numerical scale from 1 to 9, as shown in Table 2.4 below.

Table 2.4 The Relative Importance between 2 Criterion

Value of a_{jk}	Interpretation
1	j and k are equally important
3	j is slighty more important than k
5	j is more important than k
7	j is strongly more important than k
9	j is absolutely more important than k

2.9   OMAX

Objective Matrix (OMAX) is a partial productivity measurement system developed to monitor the productivity of each part company with the appropriate criteria (Avianda et al., 2014). This model has been developed by Dr. James L. Riggs. OMAX is introduced in the middle of 80 in USA.

The function of OMAX are:

- As a tools for measuring productivity
- As a troubleshooting tool productivity
- The monitor of productivity growth

2.10   Preceding Researches

Several researches about knowledge management and knowledge audit are already done. However there is no preceding researches which had an output as the same as this research. Most of the researches criticized about knowledge database without defining the critical knowledge and its position. A study from (Kim, 2005-2006) consider about knowledge mapping in the industrial case study. In this research, the author develops the idea of knowledge mapping come up with

critical knowledge for designing a comprehensive critical knowledge for several perspectives, such as production process, distribution, marketing and so on.

There is some similarity between this research and previous researches which are shown in table 2.5.
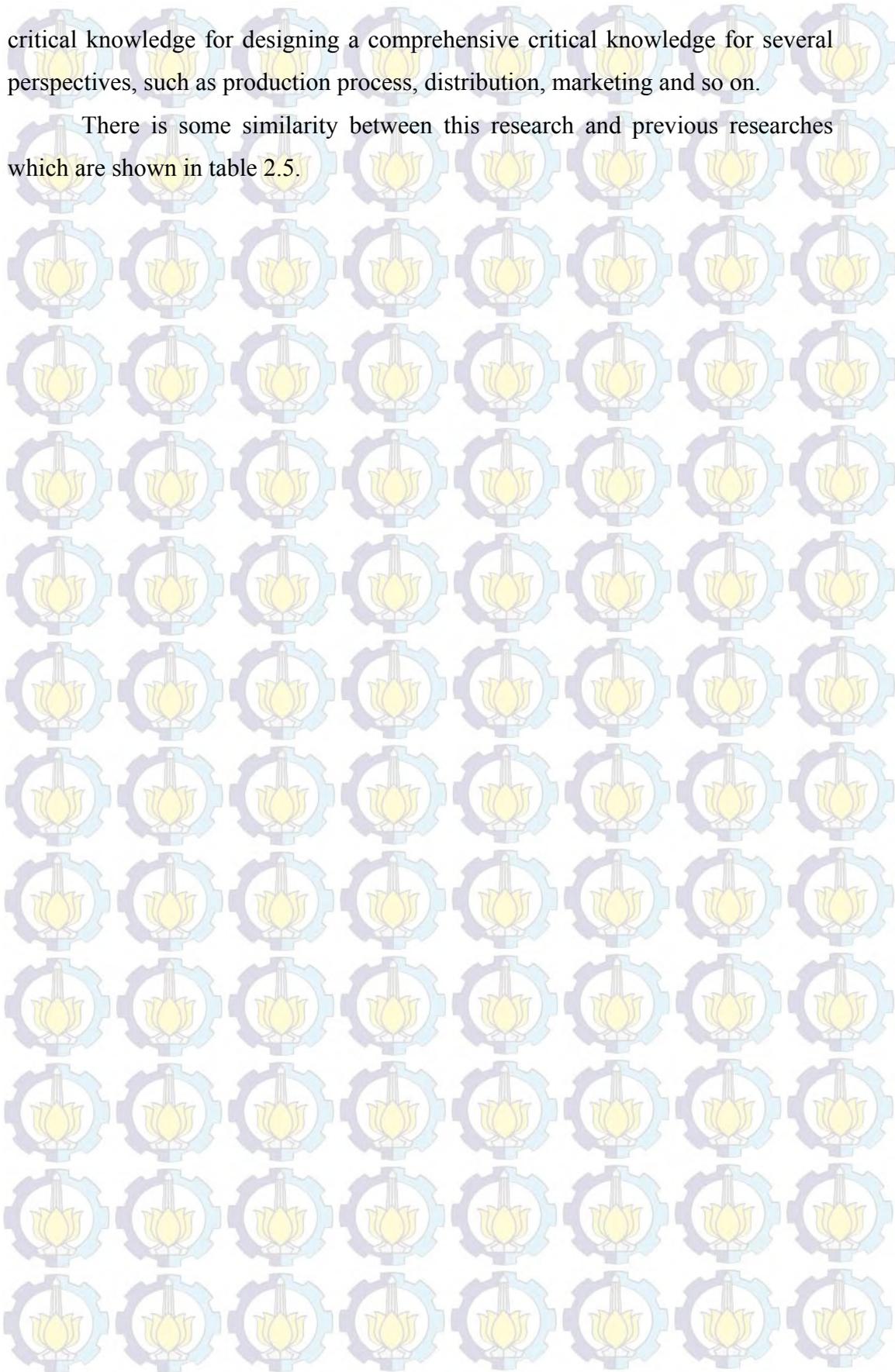
Table 2.5 Comparison of the Research being done with Previous Researches

No	Author	Year	Research Object	Method	Topics				Output
					Knowledge Management	OMAX	Knowledge Capturing	AHP	
1	Atikah Aghdhi Pratiwi	2014	PT. Semen Indonesia (Persero) Tbk.	ANP	√		√	√	Database Knowledge and Knowledge Diagram
2	Adisty Anjana Putri	2014	Asosiasi Pengelola dan Pemberdayaan Sanitasi (APPSANI)	Knowledge Audit	√		√		Knowledge sharing scheme and knowledge enabler
3	Arvinda Tiarma Sari Lubis	2014	PT. Garuda Maintenance Facility (GMF) Aerosia	AHP-Correlation Matrix	√		√	√	Database Knowledge and Knowledge Diagram
4	Aldilah Rifna Ghaisani	2015	PT. Petrokimia Gresik	Knowledge Mapping, AHP	√	√	√	√	Critical knowledge and knowledge mapping

CHAPTER 3
RESEARCH METHODOLOGY

This chapter will explain all steps conducted in this research so that the research can run in systematic way. This chapter also provides explanation on how the research is conducted.

3.1 Flowchart of Methodology

Research methodology is divided into 4 main aspect: problem identification and formulation stage, data collection stage, data processing stage, analysis and result interpretation stage; and conclusion and recommendation stage. The flowchart is shown in figure 3.1.
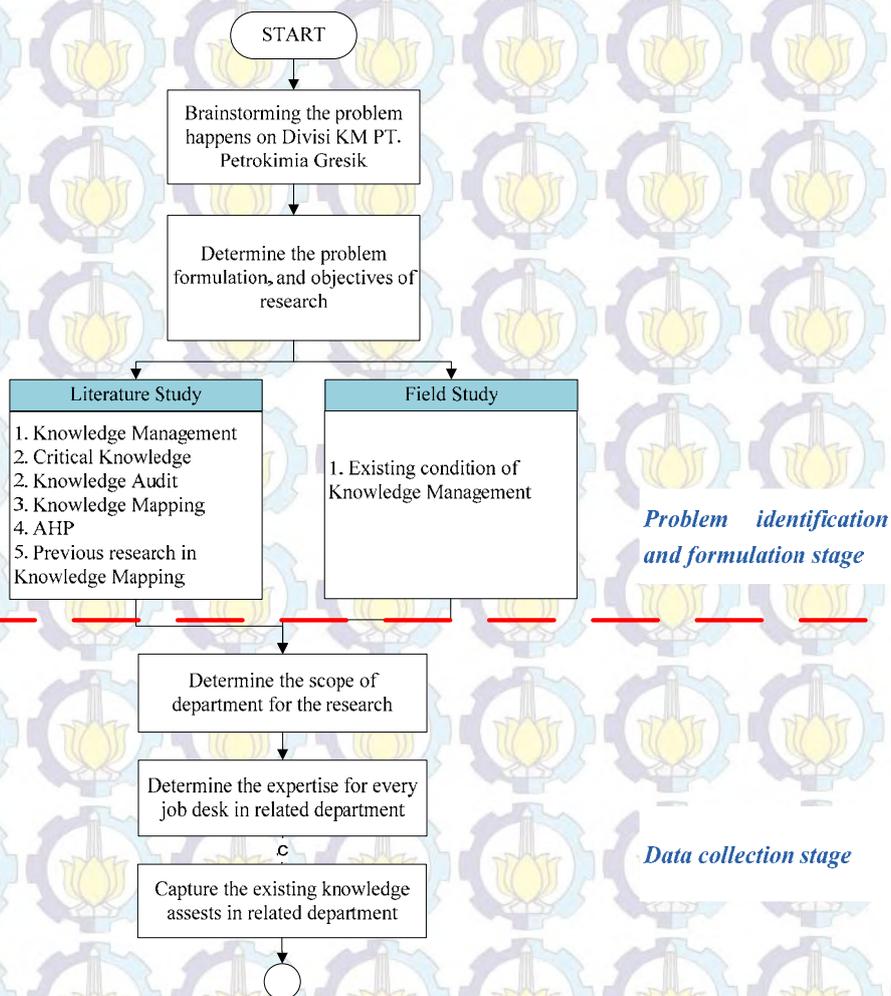
Figure 3. 1Flowchart Methodology
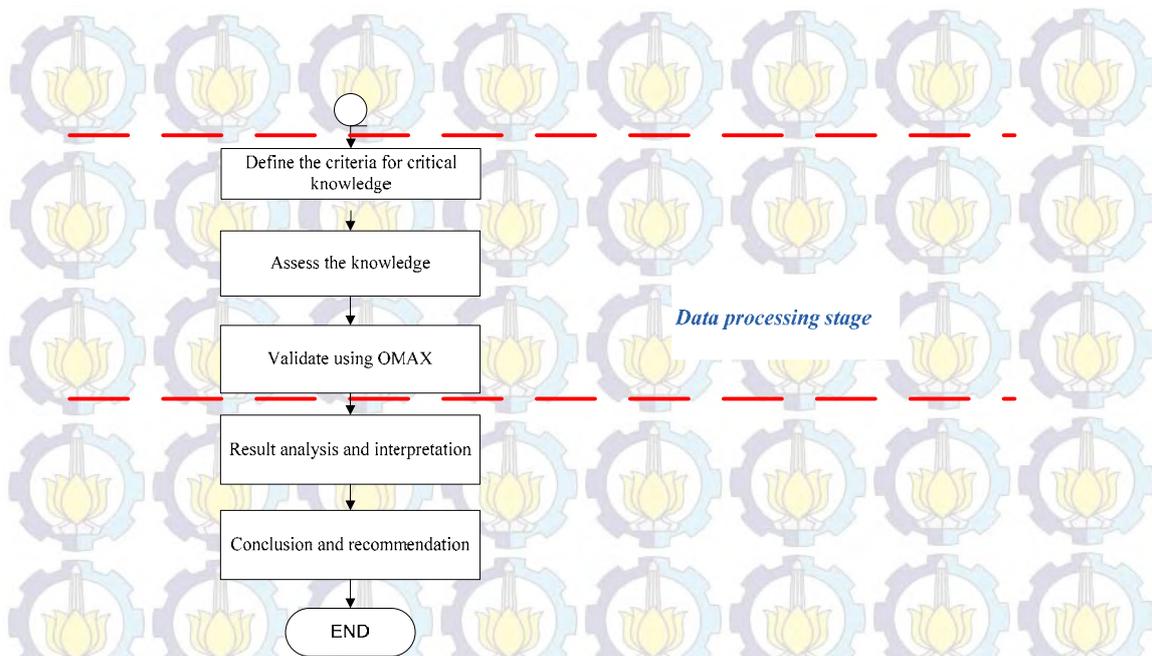
Figure 3. 2Flowchart Methodology (cont')

3.2 Flowchart Explanation

From the flowchart above, this research could be deployed into 5 mainly steps which are: problem identification and formulation, data collection, data processing, analysis and result interpretation and the last step is conclusion and recommendation. Deeper explanation would be done in the subchapters below.

3.2.1 Problem Identification and Formulation Stage

In problem identification and formulation stage, there are 3 main steps which are explained in subchapter below.

3.2.1.1 Problem Brainstorming

Problem brainstorming is done by doing quick research about Divisi Knowledge Management in PT. Petrokimia Gresik. The quick research is done to know more about the existing condition of Divisi KM, the purpose of the research will be done, how the research will be conducted and the expected company from this research.

3.2.1.2 Problem and Objectives Formulation

The expected condition of this research is known from problem brainstorming and the existing condition is also known by doing direct communication with Divisi KM manager. Thus the gap between the expected condition and existing condition could be said as problems.

Actually PT. Petrokimia Gresik has already has their knowledge management system, but there is no distinction among the knowledge, which one the knowledge greatly needed and which ones can be ignored. The system user has difficulties in differentiate the knowledge based on their needs. The distinction of knowledge is needed for every knowledge exist in PT. Petrokimia Gresik daily life, especially for its critical knowledge. Thus, problem formulation in this research is how to define the flow of critical knowledge flow in term of KM's activity readiness.

3.2.1.3 Literature Study and Field Study

Literature study is done to support the research in term of enriching the knowledge from theoretical perspective. Literature study is done by deriving several sources such as books, journals, preceding researches, and any related reliable sources.

The field study is done to deeply understand about the condition happen in Divisi KM. the field study is done by direct observing and interviewing the manager of Divisi KM. By using this technique, the author can expect the data should be collected for data processing.

3.2.2 Data Collection Stage

In data collection stage, there are 3 main steps which are explained in subchapter below.

3.2.2.1 Scope of Department Determination

The scope of department determination selected is Departemen Produksi IIA and Departemen Produksi IIB of PT. Petrokimia Gresik. The selected department is based on 2 important factors:

- Departemen Produksi as a company core business has several problems and knowledge rather than other departments.

- Departemen Produksi IIA dan IIB produce a product which is not produce in other fertilizer companies namely Phonska, NPK and SP-36

3.2.2.2 Expertise Determination

The expertise will be select for every production process. The selected expertise is based on several consideration:

- Personal factor (education level, position level)
- Employee work period factor
- Retirement period factor

3.2.2.3 Knowledge Capturing

Knowledge data collecting or known as knowledge capturing will be capture using questionnaire. Every expertise will get the same question about production process and problems happen in Departemen Produksi IIA and IIB.

3.2.3 Data processing stage

In data processing stage, there are 5 main steps which are explained in subchapter below.

3.2.3.1 Criteria of Knowledge Determination

After all data is collected then criteria of knowledge will be determined. The determination of these criteria is done among the author, expertise and manager of the Division KM. The level determination for each criterion also will be performed in this stage.

3.2.3.2 Assess the knowledge

After criterion of knowledge is determined, the next stage assess every knowledge appear in related unit using defined criteria. The interview and brainstorming is used to determine the value of every knowledge. From this stage, the critical knowledge will be identified.

3.2.3.3 Validate using OMAX

After all critical knowledge has been identified, the the last step is validate the critical knowledge to know whether that knowledge is really critical or not.

3.2.4 Analysis and result interpretation stage

This stage interprets the result of processing data stage. The analyses that will be done in this stage are existing condition analysis, the scope of department determination analysis, expertise determination analysis, criteria for critical knowledge determination analysis, knowledge weighting determination analysis, and knowledge flow for critical knowledge determination analysis.

3.2.5 Conclusion and recommendation stage

This stage is the final stage of the research. Research conclusion is done to answer the research objectives. Besides, recommendation is developed on behalf of giving advice of research execution.

CHAPTER 4
DATA COLLECTION AND PROCESS

This chapter contains the 2 main purposes: data collecting and data processing. Data collecting contains of the information come from the observed object. Data collecting is used as input to the next stage. Whether data processing is the main ojective for this research. Data processing has to be done to answer the objective of research.

4.1 Profile of PT. Petrokimia Gresik

This sub-chapter describes about PT. Petrokimia Gresik condition in general, start from history of company, vision, mission and business strategy, plants and products, until company's organization structure.

4.1.1 History of Company

PT. Petrokimia Gresik is the most complete fertilizer factory which is begun with the project from Governor in 1964, called as *Proyek Petrokimia Surabaya*. This project inaugurated by President of RI in 10th of July 1972, then this date is given as the celebration day of PT. Petrokimia Gresik, is a priority project based on TAP MPRS No. II/MPRS/1960 and Kepres No. 260/1960.

The chosen area in Gresik based on the reliability test result in 1962 by *Badan Persiapan Proyek-proyek Industri* (BP3I) managed by *Departemen Perindustrian Dasar dan Pertambangan*. In that time, Gresik was an ideal assessed with several considerations, such as:

- Choosing a barren area, PT.Petrokimia Gresik occupies the area which is less fertile for agriculture.
- Gresik is near the water resource from *Sungai Brantas* and *Sungai Bengawan Solo.*
- Gresik is near the customer area such as plantations and sugar cane farmers.

- Gresik is near the port which is make it easy to bring the factory tools for construction, raw material procurement, or distribute the product through the sea traffic line.
- Choosing an area near the city so that skilled labor and trained labor is easy to be obtained.

PT. Petrokimia Gresik, one of Holding of PT. Pupuk Indonesia (Persero) member based on SK Kementerian Hukum & HAM Republik Indonesia, AHU-17695.AH.01.02 Tahun 2012, has already changed for several times along with the era of business, they are:

1. *Projek Petrokimia Surabaja* (1963-1971)
2. *Perusahaan Umum* (Perum) PP No. 55/1971
3. PT. Petrokimia Gresik Persero PP No. 35/1974 PP No. 14/1975
4. The member of Holding of PT Pupuk Sriwidjaja (Persero) PP No. 28/1997

This company occupied three locations, which are:

1. Gresik sub-district include of Ngipik, Karangturi, Sukorame, Tlogopojok;
2. Kebomas sub-district include of Kebomas, Tlogopatut, Randuagung; and
3. Manyar sub-district include of Roomo Meduran, Pojok Pesisir, Tepen

The total area is about 450 Ha. Until this time, PT. Petrokimia Gresik has already been expansion for six times, which is fertilizer factory built by PT. Rekayasa Industri namely Phonska for the 6th-expansion.

Nowadays, PT. Petrokimia Gresik has several subsidiaries which is from the company project whether with the domestic company or aboard company. Some of subsidiary is described below.

1. PT. Petrosida Gresik

   The stock of this subsidiary company is 99.99% owned by PT. Petrokimia Gresik and 0.01% owned by K3PG. PT.Petrosida Gresik is being operated since 1984 to supply raw material for PT. Petrokimia Kayaku. The product is most about active-pesticide such as:

   - BFMC with capacity of product 2500 ton/year
   - MIPCwith capacity of product 700 ton/year
   - Diazinon with capacity of product 2500 ton/year

- Carbofuron with capacity of product 900 ton/year
- Carboxyl with capacity of product 200 ton/year

2. PT. Petrokimia Kayaku

Built in 1977 where the product namely Formulator Pepticide. PT. Petrokimia Gresik is owned about 60% stock from this subsidiary company. Another is Nippon Kayaku Co. Ltd Company as big as 20% and Mitsubishi Corporation as big as 20% from the total stock.

Besides subsidiary company, PT. Petrokimia Gresik also has several joint ventures company, such as:

1. PT. Kawasan Industri Gresik (KIG)

The stock of this subsidiary company is 35% owned by PT. Petrokimia and 65% owned by PT. Semen Gresik. KIG is a ready-used industrial plot with area 135 Ha. This company is needed to serve any kind of industry activity include Export Processing Zone.

2. PT. Petronika

The stock of this subsidiary company is 20% owned by PT. Petrokimia and 80% owned by Nippon Indonesia Kanzai. PT. Petronika is being operated since 1985 with the product namely *Diocthyl Pthalate* (DOP) with capacity of product 30.000 ton/year.

3. PT. Petrocentral

The stock of this subsidiary company is owned by PT. Petrokimia Gresik as big as 1.47%. PT. Petrocentral is being operated since 1990 with the product produced namely *Sodium Tipoly Phosphate* (STTP)

4. PT Jordan Abadi

The main business of this company is *Phosphoric Acid* with the stock owned by PT. Petrokimia Gresik as big as 50%.

5. PT. Padi Energi Nusantara

The main business is plantation especially in rice industry. The stock owned by PT. Petrokimia Gresik as big as 13.79%.

6. PT. Bumi Hijau Lestari

The main business is agribusiness and agro-industry plantation/forestry with the objective to preserve environment, soil and water. The stock owned by PT. Petrokimia Gresik as big as 8.17%.

Beside subsidiary company and joint venture Company, PT. Petrokimia Gresik also built a foundation. PT. Petrokimia Gresik's foundation is established since June 26th 1965. The objective purpose is to obtain welfare of employee and retired-employee. One program which is done by this foundation is housing-constructing for employee. Until the year of 1999, PT. Petrokimia Gresik's foundation has built 1.886 units of house in *Pongangan* and *Bunder*. Another program are preservation of retired-employee's health, society supporting, and training for employees who are entered a period of preparation for full duty. In that development, PT. Petrokimia Gresik's foundation has had several businesses managed by subsidiary company. Subsidiary company managed under PT. Petrokimia Gresik is:

PT. Gresik Cipta Sejahtera (GCS)

PT. Gresik Cipta Sejahtera (GCS) is established in April 3rd 1972. The sectors of business are distributor, spare part supplier, raw material of chemical industry, chemical material transport, and small business coaching.

PT. Aneka Jasa Ghradika (AJG)

PT. Aneka Jasa Ghradika (AJG) is established in November 10th 1971. The sectors of business are provision of daily employee or worker, piece-work services, cleaning service, and housekeeping.

PT. Graha Sarana Gresik (GSG)

PT. Graha Sarana Gresik (GSG) is established in May 13th 1993. The sectors of business are provision of accommodation, rental office, and travel services.

PT. Petrokopindo Cipta Selaras (PCS)

PT. Petrokopindo Cipta Selaras (PCS) is established in May 13th 1993. The sectors of business are transport services and general trading.

4.1.2 Vision, Mission and Company's Business Strategy

Here is vision, mission and business strategy of PT. Petrokimia Gresik:

4.1.2.1 Vision

Vision is the commitment of all Directors and employees of PT. Petrokimia Gresik to put customer as the central focus by continuously increasing the product quality and creating innovative products without forgetting the importance of cost efficiency so that the company is capable to provide high competitive products and satisfy customers.

The vision of this fertilizer company is "To be a fertilizer and chemical producer which having high competitiveness and whose products are mostly wanted by consumers" (PT. Petrokimia Gresik, 2014).

4.1.2.2 Mission

To achieve that vision, the company's missions are:

1. To support national fertilizer supply in order to achieve food self sufficiency program
2. To increase company's return to facilitate the company's day-to day operation as well as its development program
3. To develop the business potential to support the National chemical industries and active in community development

As the most complete fertilizer producer, placing the first priority on healthcare and safety for the better environment at every operational activity is a focus of corporate values. Another corporate values are:

- Exploring owned professionalism for improving customer's satisfaction
- Never ending innovation for winning the competition
- Keeping the integrity above all aspects
- Building team spirit cohensively

4.1.2.3 Company's Business Strategy

Business strategy is defined based on company's performance targets which are for 2015 said as:

1) Highest rate operation with safe and the best condition
2) Scheduled preventive maintenance.

3) Enhance the environmental regulatory compliance

4) High discipline of K3 and process safety management implemetation

5) Plant's process optimization has to be done in effective.

6) Rearrange marketing network and enhance communication intensity with the relevant institution (local government, Distan, Disbun, and KP3)

7) Marketing network development (distributor and kiosk) and farmer's group.

8) Conducting delivery before plantation season (building stock) and adjust delivery with the fertilizer absorption realization.

9) The addition of alternative mode and efficient distribution path with the selection of strategic warehouse location

10) Looking for domestic and international business partner

11) Looking for access to various financial institution (for both domestic and international)

12) Ensuring the subsidiry bill in 2015, underpayment bill in 2012 and 2013 that had been planned in Nota Keuangan RAPBN 2015 can be realized.

13) Tight cash flow management and maintain the availability of leniency pull a working capital loan facility

14) Obtain alternative funding from banks and non-banks with the optimum borrowing cost.

15) Doing Cost Reduction Program.

4.1.3 Plants and Products

PT. Petrokimia Gresik has 3 fertilizer plants named as plant 1, plant 2 and plant 3. Every plants produce a different product based on the type of raw material.
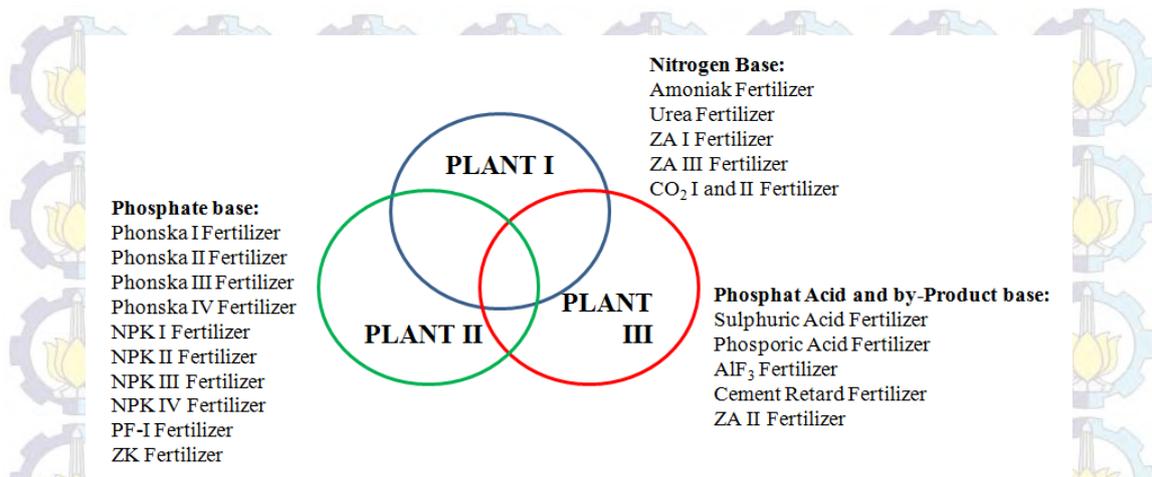
Figure 4.1 The Product's Map
(Source: PT. Petrokimia Gresik)

Plant 1 focuses on nitrogen base as raw material, plant 2 focuses on phosphate base and the rest is focuses on phosphate acid and by-product base. Every product produce has their own capacity, which is shown in table 4.1 and 4.2.

Table 4. 1 Number of Plant and Production Capacity of Fertilizer Product

Fertilizer	Plant	Capacity/year	Period
Urea	1	460.000 ton/year	1994
Phosphate	1	500.000 ton/year	1979, 1983, 2009
ZA	3	650.000 ton/year	1972, 1984, 1986
NPK	1	460.000 ton/year	
Phonska I	2	1.280.000 ton/year	2000
Phonska II & III	1	600.000 ton/year	2005, 2009
Phonska IV	1	70.000 ton/year	2011
NPK I	2	100.000 ton/year	2005
NPK II	1	200.000 ton/year	2008
NPK III & IV	1	60.000 ton/year	2009
NPK Blending			2003
K_2SO_4	1	10.000 ton/year	2005
Petroganik	1	10.000 ton/year	2005
Number of Plant/Capacity		**4.400.000 ton/year**	

(Source: PT. Petrokimia Gresik)

Table 4. 2 Number of Plant and Production Capacity of Non-Fertilizer Product

Non-Fertilizer	Plant	Capacity/Year	Period
Ammoniac	1	445.000 ton/year	1994
Sulfuric Acid (98% H_2SO_4)	1	570.000 ton/year	1985
Phosphoric Acid (100% P_2O)	1	200.000 ton/year	1985
Cement Retarder	1	550.000 ton/year	1985
Fluoride Aluminum	1	12.600 ton/year	1985
Number of Plants/Capacity		**1.777.600 ton/year**	

(Source: PT. Petrokimia Gresik)

4.1.4 Company's Structure Organization

Based on decide letters from Director Pronouncement Number 0404/LI.00,01/30/SK/2011 dated on December 1st 2011, PT. Petrokimia Gresik organization structure is shown in Figure 4.1.

Basically, there are four directorates and several managers in PT. Petrokimia Gresik' structure organization. Every directorate is guided by a director and every director guides some manager under that directorate called as compartment. Every compartment has several departments. Actually, department also has several divisions, but in Figure 4.1 there are no description about division for each department.
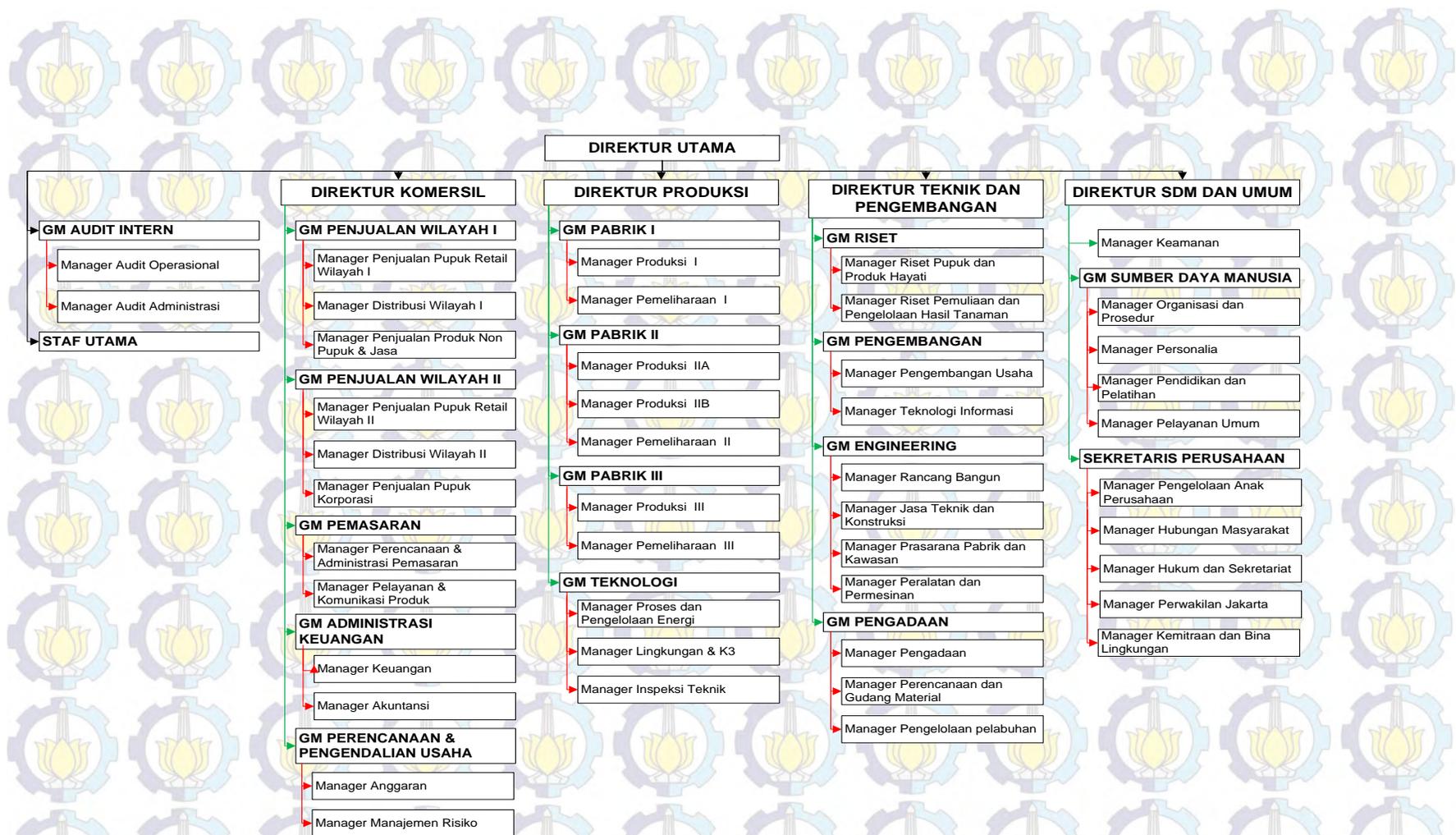
Figure 4. 1 Organization Structure of PT. Petrokimia Gresik
(Source: PT. Petrokimia Gresik)

4.2   Units Determination

Based on the real condition in PT. Petrokimia Gresik, the department choosen as observed object for this research is Departemen Produksi 2A. The reason are:

1. Production department is a main business process for fertilizer company.
2. Production IIA Department produces a product which is not produce in other fertilizer company.
3. Production II Department is the most supporting department from the economy point of view (profitability is at most).

4.2.1   Production IIA Department

Here is the explaination about the Production IIA Department, start from products produced as well as the functional organization structure.

4.2.1.1 Products

Plant with phosphate raw material as the main ingredients of fertilizer produces two main types : Phonska and Phosphate I. The combination of the raw materials can be seen in this Table 4.3.

Since 2008, SP 18 is no longer produced. This is caused by the fact that the type of soil in Indonesia is not appropriate to use SP 18 fertilizer. Soil conditions using SP 18 fertilizer can be solid.

In terms of quantity, Phonska fertilizer produces more products each year because of the type of Phonska fertilizer is more than Phosphate I fertilizer. On the other hand, Phosphate I fertilizer is a fertilizer that becomes the origin of the establishment of PT. Petrokimia Gresik. Phosphate I fertilizer become a spearhead of PT. Petrokimia 's development since its established.

Table 4. 3 Raw Material from Production IIA Department's products.

No	Raw Material and Utility	Unit	Phonska			Phosphat I	
			I	II	III	SP 36	SP 18
1	Phosphat Rock	Ton/ton	-	-	-	0.491	0.4471
2	Phosphat Acid	Ton/ton	0.2778	0.2778	0.2778	0.384	0.1581
3	Sulphuric Acid	Ton/ton	0.2166	0.2166	0.2166	0.128	0.0603
4	Gypsum	Ton/ton	-	-	-	-	0.3679
5	Clay	Ton/ton	0.03	0.03	0.03	-	0.0347
6	Ammonia	Ton/ton	0.1371	0.1371	0.1371	-	-
7	ZA	Ton/ton	0.1	0.1	0.1	-	-
8	Urea	Ton/ton	0.036	0.036	0.036	-	-
9	KCl	Ton/ton	0.25	0.25	0.25	-	-
10	Electricity	KWh/ton	131.8	69	69	58	58
11	Water	m3/ton	0.858	0.5	0.5	0.26	0.26

Source: (PT. Petrokimia Gresik, 2014)

4.2.1.2 Organization Structure

Organizational structure of Production IIA Department is shown in figure 4.3 below.
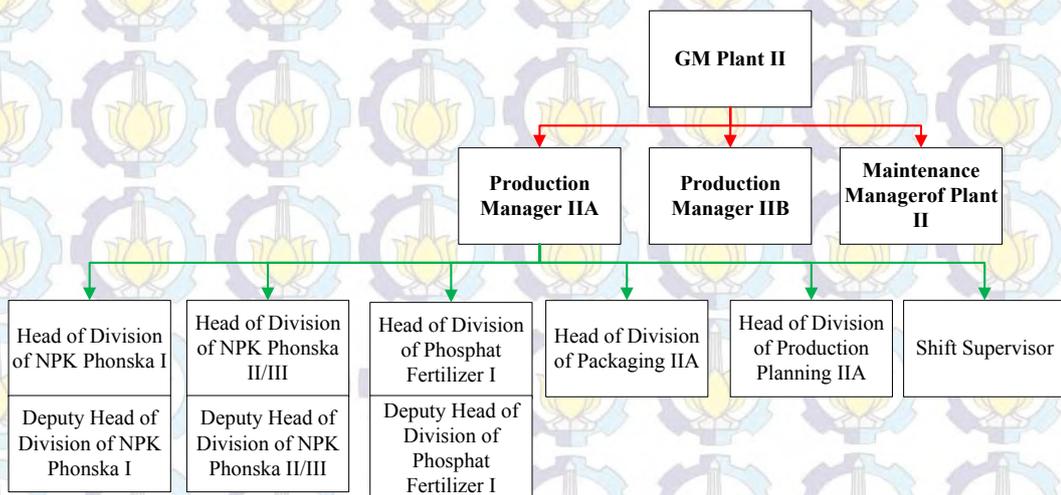
Figure 4. 2 The Organization Structure of Production II Department

There are at least 360 employees in the Production IIA Department (excluding PKWT). Due to this study involved employees directly and the number

of employees there are so many, it was determined that this research will focus on the most critical parts in the Production IIA Department.

4.2.2 Critical Work Unit

Based on the interviews with Bapak Suwarno (Head of Planning and Production Control IIA Unit), in term of production units which lately often facing problem is Phosphate I fertilizer which is in quantity production point of view, this unit has not reached optimally. Based on Production IIA Department's data for last 2 years indicates that production of Phosphate I fertilizer actually decreased when compared to other products.

Table 4. 4 Realization and Target of Production in Production IIA Department in 2013-2014

	PF I		%	Phonska I		%
	R	T		R	T	
2013	517757	510000	101,52%	307812	415000	74,17%
2014	400508	510000	78,53%	381572	445000	85,75%
	Phonska II		%	Phonska III		%
	R	T		R	T	
2013	537633	600000	89,61%	2346	5000	46,92%
2014	590744	590000	100,13%	592356	592000	100,06%

Source: PT. Petrokimia Gresik (2015)

Thus, unit Phosphate I Fertilizer is determined as a critical work unit. Moreover, Unit Production Planning and Control IIA is also determined as critical work unit because Unit Production Planning and Control IIA has a direct relation with unit Phosphate I Fertilizer

In the past, Phosphate I fertilizers produced by Production IIA and IIB department, but now only production IIA department actively operates to produce Phosphate I fertilizers. Basic materials of Phosphate I are Phosphate Rock, SA (Sulphuric Acid), and PA (Phosphoric Acid) which is obtained through import. From the result of interview with the Deputy Head of Unit Phosphate I Fertilizer, there is often a problem concerning this raw material. In addition, a gap of product's quality often happens.

Therefore, unit Phosphate I Fertilizer and unit Production Planning and Control IIA defined as critical work unit and serve as the main object of this research. Here is a functional of organizational structure of each unit.
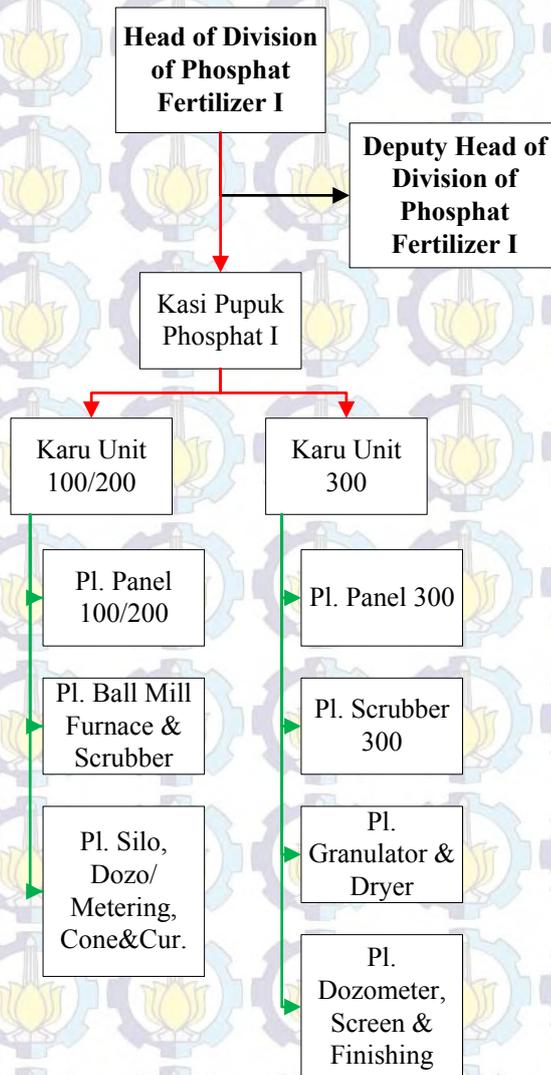
Figure 4. 3 The Organization Structure of Phosphat I Unit in Plant IIA(Petrokimia Gresik, 2015)
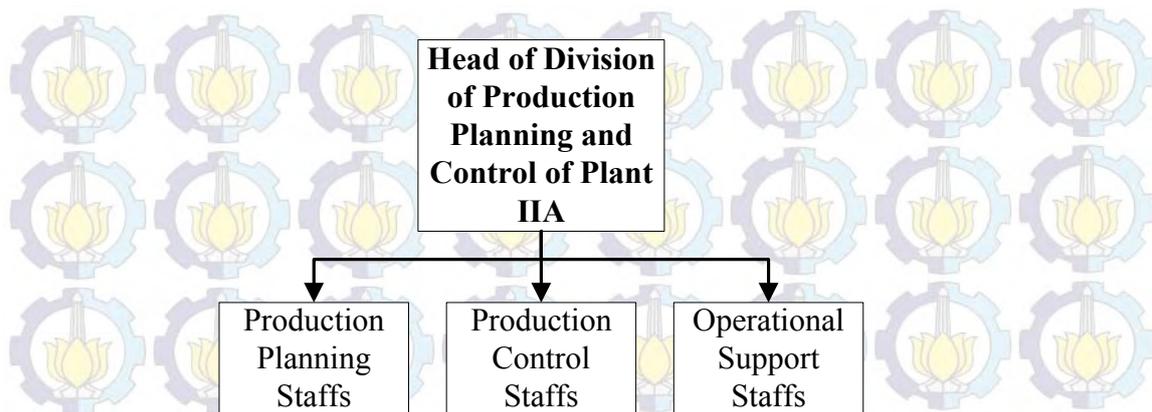
Figure 4. 4 The Organization Structure of Unit Production Planning and Control IIA (Petrokimia Gresik, 2015)

4.3   Expertise Determination

Before carried out the translation of existing activities and knowledge needed, analysis of the experts in the critical work unit should be done first, caused by:

1. Employee in Unit Phosphate I fertilizer has 2 type of work hour: normal D and shift system.

   Normal D   : 07.00-16.00

   Shift I   : 07.00-15.00

   Shift II   : 15.00-23.00

   Shift III   : 23.00-07.00

2. Not all employees will be subjected to the process of the interview (remembering of the diverse work system) and so we need only the experts who can represent all the knowledge needed in the unit.

3. Employees who will become the subject to the assessment process is an employee with position Eselon III (Kepala Bagian), Eselon IV (Kepala Sidang) dan Eselon V (Kepala Regu).

Based on business processes that applied in PT . Petrokimia, the expert is:

- People who are capable of performing their duties and responsibilities within the department or unit
- People who are able to solve problems quickly and accurately as well as creating innovation in order to accelerate the work
- People who have qualified experience in the department or unit

That points is the result of brainstroming with Head of Diklat Department, Unit Knowledge Management and part of Production IIA Department.

4.3.1 Expertise criteria parameter

After 3 points of expert has been accepted by related department used in this research, then criteria of expert has to be determined. The criteria formulate by 3 party: Pendidikan dan Pelatihan Department, Departemen Organisasi dan Prosedur Department, and Production IIA Department.

4.3.1.1 Expertise Criteria from Pendidikan dan Pelatihan Department

Quoting from previous researchs that are still relevant (the confirmation result with the researcher), Pendidikan dan Pelatihan Department stated that criteria of expert for the employee is as shown in this Table 4.5.

Table 4. 5 Expertise Criteria from Departemen Pendidikan dan Pelatihan Dept.

Source	No	Expertise Criteria	Type
Pendidikan dan Pelatihan (Diklat) Dept.	1	Formal education	Quantitative
	2	Education after work	Quantitative
	3	Be on time	Quantitative
	4	SKI/PAK Parameter	Quantitative
	5	Following self-development program	Quantitative
	6	Number of certification	Quantitative
	7	Competence value	Quantitative
	8	Awarding	Quantitative
	9	Supervising student for research	Quantitative
	10	Supervising employee under their position	Quantitative
	11	Speaker of meeting	Quantitative
	12	Being a member of specific duty	Quantitative
	13	Being a member of external professionalism institution of company	Quantitative
	14	Contribution for work unit	Qualitative
	15	Work experience	Qualitative
	16	Recognition from work-partner	Qualitative

Source: (Arbi, 2014)

4.3.1.2 Expertise Criteria from Organisasi dan Prosedur Dept.

The person who participied in the determination of expert's criteria is Division of Knowledge Management. Division of Knowledge Management has responsibility to handling the existing knowledge in the company. As well as the definition og expert's criteria result from Pendidikan dan Pelatihan Department, the criteria from Division of Knowledge Management also refers on previous research, as shown in table 4.6

Table 4. 6 Expertise Criteria from Unit Knowledge Management

Source	No	Expertise Criteria	Type
Unit Knowledge Management	1	Formal education	Quantitative
	2	Education after work	Quantitative
	3	Parameter of SKI/PAK	Quantitative
	4	Participant on development project of company	Quantitative
	5	Following self-development program	Quantitative
	6	Number of certification	Quantitative
	7	Awarding	Quantitative
	8	Speaker of internal meeting	Quantitative
	9	Speaker of external meeting	Quantitative
	10	Make treatise	Quantitative
	11	Make work instruction	Quantitative
	12	Being a member of specific duty	Quantitative
	13	Being a member of external professionalism institution of company	Quantitative
	14	Active in work program of company	Qualitative
	15	Contribution for work unit	Qualitative
	16	Work experience	Qualitative
	17	Problem solving ability	Qualitative
	18	Recognition from work-partner	Qualitative

Source: (Arbi, 2014)

4.3.1.3 Expertise Criteria from Production IIA Department

The person who participated in the determination of expert's criteria is Unit Phosphat Fertilizer I dan Unit Production Planning and Control IIA. These 2

units is an observed object of this research. The head of every unit define several criteria for expert as shown in table 4.7 below.

Table 4. 7 Expertise Criteria from Departemen Produksi 2A

Source	No	Expertise Criteria	Type
Plant IIA Department	1	Formal education	Quantitative
	2	Parameter of SKI/PAK	Quantitative
	3	Number of certification	Quantitative
	4	Speaker of internal meeting	Quantitative
	5	Make treatise	Quantitative
	6	Make work instruction	Quantitative
	7	Contribution for work unit	Qualitative
	8	Work experience	Qualitative
	9	Problem solving ability	Qualitative

4.3.1.4 Expertise Criteria form Journal

From the jurnal entitled "Critical Knowledge Map as a Decision Tool for Knowledge" found that the expert's criteria is as shown in table 4.x.

Table 4. 8 Expertise Criteria from Journal

Source	No	Expertise Criteria	Type
A journal (Critical Knowledge Map as a Decision Tool for Knowledge)	1	Education	Quantitative
	2	Certificates	Quantitative
	3	Position	Quantitative
	4	Age	Quantitative
	5	Year of entry in the company	Quantitative
	6	Past experience (before joining the company)	Quantitative
	7	Experience in the knowledge domain	Quantitative

Source: (Ermine, Boughzala, & Tounkara, 2006)

Based on that 4 sources, the criteria which will be a reference in order to determine expert are:

Table 4. 9 Expert Criteria for Expert Determination

No	Expertise Criteria	Type	Aspect	Assessment Method
1	Formal education	Quantitative	Profile	Questionnaire
2	Education after work	Quantitative	Profile	Questionnaire
3	Number of certification	Quantitative	Profile	Questionnaire
4	Competence value	Quantitative	Pelaksanaan kerja	Asking on Head of Division or another work team
5	Awarding	Quantitative	Profile	Questionnaire
6	Supervising student for research	Quantitative	Research	Questionnaire
7	Supervising employee under their position	Quantitative	Pelaksanaan kerja	Questionnaire
8	Speaker of meeting	Quantitative	Pelaksanaan kerja	Questionnaire
9	Make work instruction	Quantitative	Research	Questionnaire
10	Active in innovation program of company (minima: SS)	Quantitative	Research	Questionnaire
11	Contribution for work unit	Qualitative	Employee's performance	Questionnaire
12	Work experience	Qualitative	Employee's performance	Questionnaire
13	Recognition from work-partner	Qualitative	Employee's performance	Asking on Head of Division or another work team
14	Problem solving ability	Qualitative	Employee's performance	Questionnaire

4.3.2 Assessment of Employee

From those formulated criteria, the next step is testing evenly to all employee in Unit Phosphat Fertilizer I dan Unit Production Planning and Control IIA. The assessment is done through questionnaire (Enclosure 3)

4.3.2.1 Expertise Criteria Assessment

Before the assessment of each employee in the unit related work is done, the assessment of every selected criteria has to be done first. The assessment from several parties has to be done to avoid subjectivity. The parties who involved in this assessment are Unit Knowledge Management PT. Petrokimia Gresik, Unit Phosphat Fertilizer I, and Unit Production Planning and Control IIA.

The assessment is done through the questionnaire (Enclosure 3). The result of assessment processed into Expert Choice thus the weighting of each criterion is known. Here is the result of expert criteria weighting. The weighting process can be seen in Enclosure 2.

Table 4. 10 The Result of Expert Criteria Weighting

Aspect	Weight	Expertise Criteria	Weight
Profile	0,192	Eduction	0,554
		Education after work	0,063
		Certification	0,274
		Awarding	0,109
Work Execution	0,073	Nilai kompetensi (SKI/PAK)	0,361
		Membimbing karyawan dibawah	0,543
		Narasumber rapat	0,095
Research	0,221	Membimbing mhs KP/TA	0,074
		Membuat IK	0,345
		Ikut kegiatan SS	0,58
Employee's Performance	0,515	Kontribusi ke unit kerja	0,613
		Pengalaman yang dimiliki	0,125
		Kemampuan problem solving	0,211
		Pengakuan rekan kerja	0,051

4.3.2.2 Expertise of Selected Unit

Before the expert is selected, the predetermined limit value has to be define between related unit involved. It was agreed that the employee which has a value at least 75% of weighting can be expressed as expert. The assessment of every employee can be done through questionnaire (Enclosure 3)
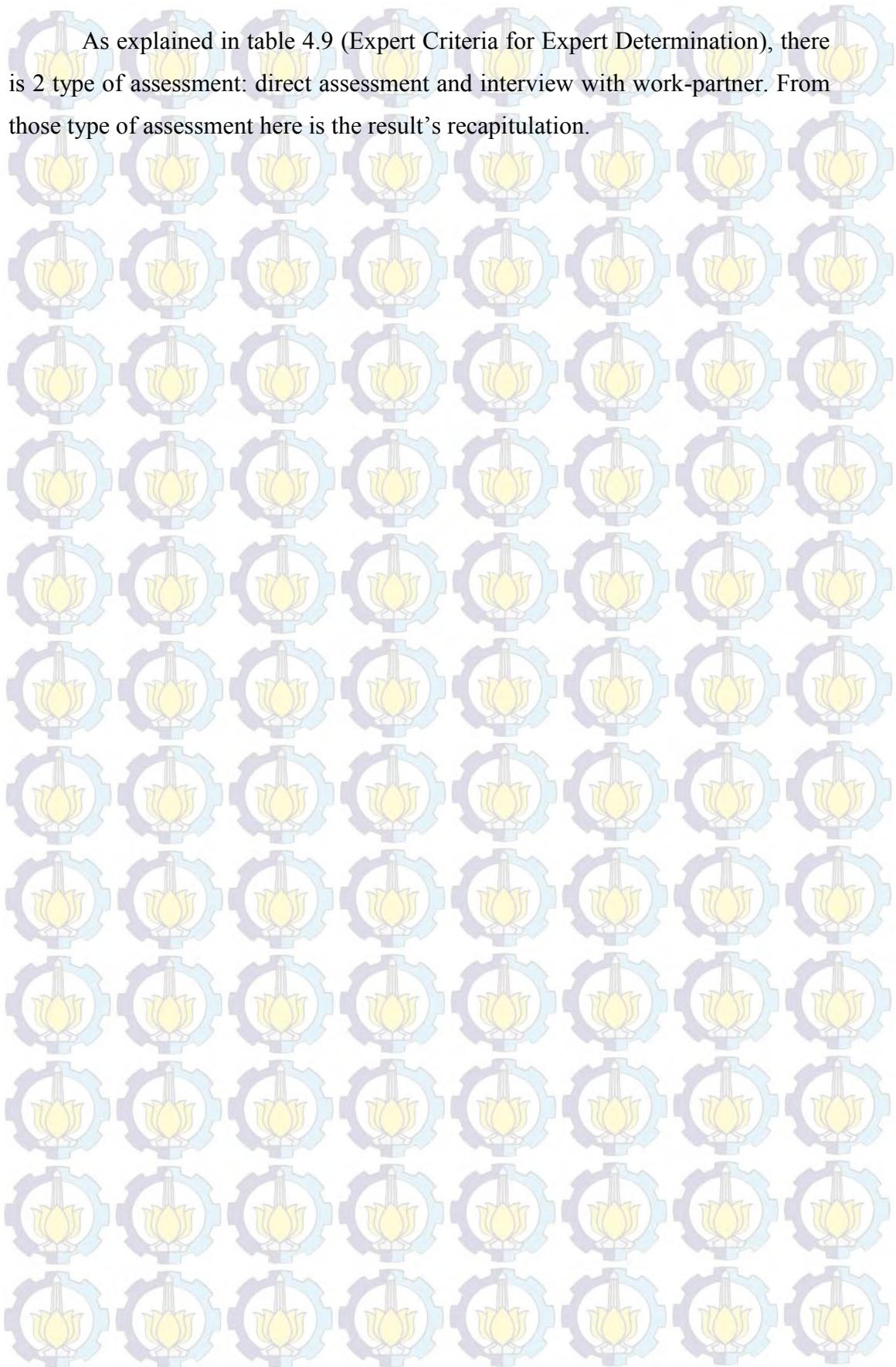
As explained in table 4.9 (Expert Criteria for Expert Determination), there is 2 type of assessment: direct assessment and interview with work-partner. From those type of assessment here is the result's recapitulation.

Table 4. 11 Individul Assessment of Unit Phosphat Fertilizer I

No	Name	Bagde	Position	Profile A (0,192)				Work Execution B (0,073)			Research C (0,221)			Employee's Performance D (0,515)				Nilai	%
				Education (1, 0,554)	Education after work (2, 0,063)	Certification (3, 0,274)	Awarding (4, 0,109)	Competence value (SKI/PAK) (1, 0,361)	Supervising an employee (2, 0,543)	Meeting speaker (3, 0,095)	Supervising student for research (1, 0,074)	Instruction work (2, 0,345)	Innovation activity (3, 0,58)	Contribution for unit (1, 0,613)	Experience (2, 0,125)	Problem solving handling (3, 0,211)	Partner recognition (4, 0,051)		
1	Sugianto	T-221978	Head of Division	3	1	4	3	4	4	3	2	3	3	4	3	3	4	3,422132	85,49%
2	Nur Wenda	T-242852	Vice head of Division	3	1	4	2	4	4	2	3	3	4	3	3	3	4	3,223108	80,52%
3	Syaifur Rosyid	T-221972	Kepala Seksi	2	1	2	1	3	2	1	2	3	3	4	2	2	3	2,849886	71,20%
4	Rudi Bintarto	T-242377	Kepala Seksi	2	1	3	2	3	3	2	3	3	2	4	2	2	3	2,85817	71,40%
5	Suyatno	T-242889	Kepala Seksi	2	1	2	2	3	3	2	3	2	2	3	3	2	3	2,477997	61,91%
6	Sumedi	T-284131	Kepala Seksi	2	1	3	1	3	2	1	2	3	3	4	2	2	3	2,902494	72,51%
7	Agus Tri Waluyo	T-242688	Karu Unit 100/200	2	1	2	2	3	2	1	1	1	2	2	3	3	3	2,11544	52,85%
8	Moh. Sofyan	T-242753	Karu Unit 100/200	2	1	2	1	3	2	1	1	1	3	3	3	3	3	2,538387	63,41%
9	M. Yasak	T-242469	Karu Unit 100/200	2	1	2	2	3	1	1	1	1	2	4	2	3	3	2,642816	66,02%
10	Sugiarso	T-284352	Karu Unit 100/200	2	1	3	1	3	2	1	1	2	3	4	3	3	3	2,982935	74,52%
11	M. Tjiptoadi	T-253575	Karu Unit 250/300	2	1	2	2	3	2	2	1	1	2	3	2	3	3	2,373695	59,30%
12	Edi Suryanto	T-242421	Karu Unit 250/300	2	1	2	1	3	1	1	1	1	2	4	2	3	3	2,621888	65,50%
13	Bismo Yuwono	T-242766	Karu Unit 250/300	2	1	3	2	3	2	2	1	2	2	3	3	2	3	2,458258	61,41%
14	Heriandi	T-232195	Karu Unit 250/300	2	2	2	1	3	2	1	1	1	3	2	3	3	3	2,234788	55,83%
	Maximum weight			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4,002824	

Table 4. 12 Individul Assessment of Unit Production Planning and Control IIA

No	Name	Bagde	Position	Profile A 0,192				Work Execution B 0,073			Research C 0,221			Employee's Performance D 0,515				Nilai	%
				Education	Education after work	Certification	Awarding	Competence value (SKI/PAK)	Supervising an employee	Meeting speaker	Supervising student for research	Instruction work	Innovation activity	Contribution for unit	Experience	Problem solving handling	Partner recognition		
				1	2	3	4	1	2	3	1	2	3	1	2	3	4		
				0,554	0,063	0,274	0,109	0,361	0,543	0,095	0,074	0,345	0,58	0,613	0,125	0,211	0,051		
1	Soewarno	T-232265	Head of Division	2	1	1	1	4	4	1	1	4	4	4	4	3	4	3,35466	83,81%
2	Ujang Suryana	T-504987	Production Planning Staff	3	1	1	2	4	4	2	4	4	4	2	2	2	4	2,669148	66,68%
3	Pinto	T-242479	Production Planning Staff	2	1	2	2	3	2	2	3	2	2	3	3	2	3	2,438358	60,92%
4	Eddy Kuswinanto	T-253404	Production Planning Staff	2	1	2	2	3	2	1	2	1	2	3	2	2	3	2,274449	56,82%
5	Sutrisno Drs	T-253711	Production Planning Staff	2	1	2	1	3	4	1	1	4	4	2	3	3	3	2,658885	66,43%
6	Muhammad Harisul B.	T-525281	Production Control Staff	3	1	1	2	4	2	2	4	3	3	4	2	3	4	3,1255	78,08%
7	Satoto Pribadi D.	T-242668	Production Control Staff	2	1	2	2	3	2	1	2	1	3	3	2	2	2	2,376364	59,37%
8	Setyo Nusantoro	T-242691	Production Control Staff	2	1	2	2	3	2	1	1	2	3	3	2	2	3	2,46252	61,52%
9	Waloejo Hary S.	T-314590	Production Control Staff	2	2	3	1	3	1	1	1	2	2	3	3	3	3	2,511517	62,74%
10	Sutrisno	T-242465	Operational Support Staff	2	1	3	3	4	3	2	2	2	3	3	3	2	3	2,689712	67,20%
11	Ari Soetanto	T-242465	Operational Support Staff	2	1	2	2	3	2	1	1	1	2	3	2	2	3	2,258095	56,41%
12	Suparto	T-242854	Operational Support Staff	2	1	2	1	3	2	1	1	1	2	3	2	2	3	2,237167	55,89%
13	Djoko Nugroho	T-253485	Operational Support Staff	3	1	2	1	3	2	1	1	2	3	3	2	2	3	2,54796	63,65%
14	Maksum	T-253290	Operational Support Staff	2	1	3	2	3	1	1	1	1	2	3	2	2	3	2,271064	56,74%
	Maximum weight			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4,002824	

From each unit, there are 2 expert which will be a subject to gather the information.

4.4 Activity and Knowledge in Selected Units

The first thing to do to solve the research problem is identify activity happen in the observer unit. Those activities will address the knowledge needed.

4.4.1 Activity

Activity happen in this 2 observer units is gather from Uraian Pekerjaan from every related unit. Here is the recapitulation of activities happens in Unit Phosphat I and Unit Production Planning and Control IIA.

4.4.2.1 Unit Phosphat I

Unit Phosphat I has several activities in their daily activity to achieve the target. Table 4.14 is the recapitulation of those activities and also the target.

Table 4. 13 Target of Unit Phosphat I

NO.	TARGET
1	Achieve production target of RKAP 2015 with total production of SP-36 is 500.000 ton.
2	Control consumption rate of raw material of poduct SP-36 which refers to RKAP 2015, with maksimum limit100% (Ph. Rock=0.53 ton/product; SA=0.15 ton/product; PA=0.4 ton/product)
3	Achieve stream days of PF I plant production with minimum 90% to RKAP 215 (277 days)
4	Implement SMK3 with zero accident
5	Control environment waste
6	Control general use budget in PF I unit maximum 1/6 from total general use bugdet of Production IIA Department
7	Plant cleanliness management (equipment, building, and authority within the plant area)
8	Product quality control
9	Employee discipline violation
10	Involved in innovation activity
11	Production operational

Table 4. 14 Activity of Unit Phosphat I

TARGET	ACTIVITY
1,2,3,6	Ensuring target implementation and achievement of work plan in the scope of PF I based on KPI/SKI
4,5,7,11	Ensuring management of PF I based on the determined procedure and IK
2,3,7	Controlling use of raw material and infrastructure in PF I
3,6,11	Ensuring the controlling on number of overtime in PF I
3,11	Ensuring draft and implementation on translate and revision of Standard Operating Procedure from equipment owner
4,5,11	Ensuring operational production is safety and environment
9	Creating positive work culture
2,8,11	Controlling the implementation of production in unit conveyor
8,11	Controlling the implamentation of production in unit panel 100-200
8,11	Controlling the implamentation of production in unit panel 250-300

4.4.2.2 Unit Production Planning and Control IIA

Unit Production Planning and Control IIA also has several activities in their daily activity to achieve the target. Table 4.16 is the recapitulation of those activities and also the target.

Table 4. 15 Target of Unit Production Planning and Control IIA.

NO.	TARGET
1	Compile draft of RKAP 2015, for Production IIA Department
2	Control consumption rate of raw material (refer to RKAP 2014, with the maximum limit 100%)
3	Raw material plan and control
4	Make a monthly report to Production IIA Department
5	Implement SMK3 with zero accident
6	Controlling budget of general use, over time, SPPD, and non-organic worker
7	Confirmation of identification data and risk control
8	Employee discipline violation
9	Make and transfer the data of production, package used and monthly raw material into Accounting Dept. Via email
10	Production operational
11	SIMPRO (Sistem Manajemen Produksi) implementation
12	Plant cleanliness management (equipment, building, and authority within the plant area)

Table 4. 16 Activity of Unit Production Planning and Control IIA.

TARGET	ACTIVITY
1,2,3,6	Ensuring target implementation and achievement of work plan in the scope of Perencanaan & Pengendalian Produksi II A based on KPI/SKI
2,3,4,11	Ensuring management of production planning in Kompartemen Pabrik II including production target and stream days, raw materials, auxiliary materials and utility based on operation pattern assigned by management
2,10,11	Ensuring management of production controlling including monitoring production relization and stock of product, ralization use of raw materials, auxiliary materials, utility, and stock of raw materials available in Departemen Produksi II A
5,7	Ensuring plan of other products packaging and moving factory's waste in the scope of Departemen Produksi II A to the area assigned by management
6,12	Ensuring the management of outsourcing job (cleaning factory area and supporting operational) including finishing administration process and supervision with production unit in the scope of Departemen Produksi II A
4,9	Ensuring draft and report presentation in regular or insidentil on implementation of Work Planin the scope of Perencanaan & Pengendalian Produksi II A with related parties
6	Ensuring management useof General Use budget and service budget in Dep. Produksi II A

4.4.2 Knowledge in Selected Units

4.4.2.1 Unit Phosphat I

From those activities explanation of every units, then the knowledge identification has to be done. The breakdown of knowledge needed has to be identified before mapping the knowledge into activities.

Table 4. 17 Knowledge Unit Phosphat I

No.	Knowledge	No.	Knowledge
1	Auditing management	18	Process quality control
2	Communication management	19	Product knowledge
3	Continuous improvement planning	20	Product quality control
4	Control room operation system	21	Production management
5	Cost management	22	Production process
6	Electrical installation	23	Production system control
7	Environmental health	24	Production target
8	Equipment maintenance	25	Raw material formulation

Table 4. 18 Knowledge Unit Phosphat I (cont')

No.	Knowledge	No.	Knowledge
9	Equipment monitoring control	26	Risk management
10	Equipment operation	27	Safety compliance
11	Equipment performance evaluation	28	SMK3 management
12	Human assurance	29	SSM Management
13	Innovation management	30	Stream days monitoring control
14	Operation process	31	Technical procedure
15	Operational Procedure	32	Training management
16	Panel board system operation	33	Waste control management
17	PPIC		

From the result of brainstrorming, the knowledge mapped into the activities is shown in table 4.18 below.

Table 4. 19 Knowledge in Activity of Unit Phosphat I

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring target implementation and achievement of work plan in the scope of PF I based on KPI/SKI	PPIC	Formulating target of operational production based on the operational variable
	Production target	
	Product knowledge	
	Cost management	
	Production management	Analyzing and evaluating production rate on target
	Cost management	
	Stream days monitoring control	Analyzing and evaluating stream days on target
	Production management	
	Production management	Planning and monitoring monthly shut down
	Equipment operation	
	Equipment performance evaluation	
	Electrical installation	
	Production management	Planning and monitoring annual shut down
	Equipment operation	
	Equipment performance evaluation	
	Electrical installation	
	Equipment maintenance	Evaluating improvement planning of equipment on target achievement
	Equipment performance evaluation	

Table 4. 20 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring management of PF I based on the determined procedure and IK	Process quality control	Monitoring operational condition based on Quality Plan
	Product quality control	
	Equipment monitoring control	Monitoring equipment that influences production process
	Equipment performance evaluation	
	Equipment maintenance	Analyzing and evaluation on process/equipment problem
	Production system control	
	Production system control	Analyzing and Evaluating on operational controlling
	PPIC	
Controlling use of raw material and infrastructure in PF I	PPIC	Monitoring efficiency of raw material usage
	Production management	
	Product knowledge	
	PPIC	Analyzing and Evaluating use of raw material that influences to operation mode
	Production management	
Ensuring the controlling on number of overtime in PF I	Equipment operation	Monitoring and controlling overtime based on factory needs
	Risk management	
	Cost management	

Table 4. 21 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring draft and implementation on translate and revision of Standard Operating Procedure from equipment owner	Risk management	Ensuring that revision of SOP has been created based on innovation result, Hazops
	Safety compliance	
	Technical procedure	
	Risk management	Monitoring SOP used is valid, original, current and adequate
	Safety compliance	
	Training management	Executing innovation clinics
	Innovation management	
	Communication management	Sharing knowledge
Ensuring operational production is safety and environment	Waste control management	Monitoring analysis of exiles waste and emission
	Environmental health	
	Environmental health	Doing safety patrol
	Waste control management	
	Environmental health	Doing safety talk
	Waste control management	
	Human assurance	Ensuring that there is no work accident in work unit
	SMK3 management	
	Production management	Follow up the finding of internal and external audit program
	Auditing management	
	Production management	Monitoring production report to CandalProd

Table 4. 22 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring operational production is safety and environment	Communication management	Coordinating regularly with boss and related unit
	Equipment operation	Make report of shut down
	Equipment monitoring control	
Creating positive work culture	Communication management	Meeting of internal coordination
	Communication management	Sharing knowledge
	Training management	Monitoring on making SKI, Guidance, and personil of PAK
	Training management	Evaluating and validating SKI, Guidance, and personil of PAK
	Training management	Evaluating and coaching of disciplinary violations based on the rules
Controlling the implementation of production in unit conveyor	Equipment operation	Monitoring smooth operation in UP Unit Conveyor including 21D-251A/B 21Q-251, 21M-257 1, 21M-257 3, 21M-258 21M-209
	Operational Procedure	
	Equipment monitoring control	
	Equipment performance evaluation	
	Production process	Proses pMoxing ROP and filter
	Raw material formulation	
	Product knowledge	
	Equipment operation	Supervising payloader loading in unit 250
	Production management	

66

Table 4. 23 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Controlling the implementation of production in unit conveyor	SMK3 management	Be responsible on implementation of safety procedure in work area
	Risk management	
	Safety compliance	
	Equipment operation	Supervising on situation and condition of equipment operation in the region
	Equipment maintenance	Check bearing, lubrication system and condition and also reporting to Kepala Regu/Kepala Seksi if there is deviation
	Equipment operation	Start/stop equipment based on operation procedure
	Production management	Performing work coordinated instruction from panel's operator of each Kepala Regu/Kepala Seksi
	Equipment maintenance	Cleaning equipment and work area
	SMK3 management	
	Equipment maintenance	Cooperating with maintenance crew/latsin if there is job in the area and helping other operators if needed
	SMK3 management	
	Communication management	Handovering clearly on substituing operator 15 minutes before work hour
	Equipment operation	
	Production process	

Table 4. 24 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Controlling the implamentation of production in unit panel 100-200	Operational Procedure	Be responsible on smooth operation and controlling operation inculding unit 100, 200 and feeding phosphate coal
	Equipment operation	
	Product quality control	Be responsible on production quality and quantity of ROP based on specification
	Product knowledge	
Controlling the implamentation of production in unit panel 100-200	SMK3 management	Be responsible on corrdination of safety procedure implementation in the work region and supervised region
	Risk management	
	Safety compliance	
	Equipment operation	Supervising operation coordination by using instrumentation in panel board
	Equipment monitoring control	
	Panel board system operation	
	Operation process	Recording operational data on log sheet every hours
	Equipment operation	
	Production management	Making SPBK, proving that, and also recording the realization
	Operation process	
	Control room operation system	Setting operational condition of raw material flow in control room
	Equipment monitoring control	
	Production process	
	Training management	Representing Kepala Regu if Kepala Regu is not available
	Communication management	

Table 4. 25 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Controlling the implementation of production in unit panel 100-200	Product quality control	Recording analysis result of laboratory and informing to Kepala Regu if thereis deviation
	Communication management	
	Product knowledge	
	Operation process	Changing operation based on operating conditions on agreement of Kepala Regu/Kepala Seksi
	Production management	
	SMK3 management	Implementing safety procedure by making permission letter based on instruction on a form that has been performed in the field
	Risk management	
	Safety compliance	
	Communication management	Making report and handovering clearly on subtitued operator 15 minutes before work hour
	Production process	
	Equipment operation	
	SMK3 management	Demanding consumer goods, administration/operation to Koordinator Perlengkapan and Kebersihan of PF I
	Equipment maintenance	
Controlling the implementation of production in unit panel 250-300	Operational Procedure	Be responsible on smooth operation and controlling operation including 21.U-250; 21.U-300; finishing unit; LVS II/HVS II and scrubbing system
	Production management	
	Equipment operation	
	Equipment monitoring control	
	Product quality control	Be responsible on production quality and quantity of ROP based on the specification
	SSM Management	
	Product knowledge	

Table 4. 26 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Controlling the implamentation of production in unit panel 250-300	SMK3 management	Be responsible on corrdination of safety procedure implementation in the work region and supervised region
	Risk management	
	Safety compliance	
	Equipment operation	Supervising operation coordination by using instrumentation in panel board
	Equipment monitoring control	
	Operation process	Recording operational data on log sheet every hours
	Equipment operation	
	Production management	Making SPBK, proving that, and also recording the realization
	Operation process	
	Equipment operation	Setting position of breakers
	Equipment monitoring control	
	Equipment maintenance	
	Control room operation system	Setting operational condition of raw material flow in control room
	Equipment monitoring control	
	Production process	
	Training management	Representing Kepala Regu if Kepala Regu is not available
	Communication management	
	Continuous improvement planning	Recording analysis result of laboratory and informing to Kepala Regu if thereis deviation
	Product quality control	

Table 4. 27 Knowledge in Activity of Unit Phosphat I(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Controlling the implementation of production in unit panel 250-300	Communication management	Recording analysis result of laboratory and informing to Kepala Regu if thereis deviation
	Product knowledge	
	Operation process	Changing operation based on operating conditions on agreement of Kepala Regu/Kepala Seksi
	Production management	
	SMK3 management	Implementing safety procedure by making permission letter based on instruction on a form that has been performed in the field
	Risk management	
	Safety compliance	
	Communication management	Making report and handovering clearly on subtitued operator 15 minutes before work hour
	Production process	
	Equipment operation	
	SMK3 management	Cleaning in the work area and helped by auxiliary operator
	SMK3 management	Demanding consumer goods, administration/operation to Koordinator Perlengkapan dan Kebersihan of PF I
	Equipment maintenance	

4.4.2.2 Unit Production Planning and Control IIA

Besides Unit Phosphat I, Unit Production Planning and Control IIA also has several knowledge needed for achieving the target.

Table 4. 28 Knowledge Unit Production Planning and Control IIA

No.	Knowledge	No.	Knowledge
1	Communication management	12	Production target
2	Cost management	13	Raw material formulation
3	Cost-benefit analysis	14	Raw material management
4	Customer service orientation	15	Safety compliance
5	Equipment maintenance	16	SMK3 management
6	Forecasting	17	SML Management
7	Manufacturing control	18	SSM Management
8	Owner estimation	19	Process Technology
9	PPIC	20	Utility quality control
10	Product knowledge	21	Waste control management
11	Production management		

From the result of brainstrorming, the knowledge mapped into the activities is shown in table 4.21 below.

Table 4. 29 Knowledge in Activity of Unit Production Planning and Control IIA

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring target implementation and achievement of work plan in the scope of Perencanaan & Pengendalian Produksi II A based on KPI/SKI	Raw material formulation	Ensuring draft target of work plan and budget in the scope of Departemen Produksi II A based on KPI/SKI
	Cost management	
	Cost-benefit analysis	
	Customer service orientation	
	PPIC	
	Product knowledge	
	Raw material formulation	Ensuring draft target of work plan and budget in the scope of Departemen Produksi II A based on KPI/SKI
	Cost management	
	Cost-benefit analysis	
	Customer service orientation	
	PPIC	
Ensuring management of production planning in Kompartemen Pabrik II including production target and stream days, raw materials, auxiliary materials and utility based on operation pattern assigned by management	Raw material formulation	Ensuring the availability of raw material, auxiliary material and utility
	PPIC	
	Utility quality control	
	Production management	
	Product knowledge	
	Forecasting	
	Raw material formulation	Monitoring stock of raw material, auxiliary material and utility
	PPIC	

Table 4. 30 Knowledge in Activity of Unit Production Planning and Control IIA(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring management of production planning in Kompartemen Pabrik II including production target and stream days, raw materials, auxiliary materials and utility based on operation pattern assigned by management	Production management	Monitoring stock of raw material, auxiliary material and utility
	Product knowledge	
	Cost management	Ensuring draft target of annual RKAP and production target 3 monthly
	Manufacturing control	
	Production management	
	Production target	
	Manufacturing control	Ensuring down time and stream days based on assigned target
	Equipment maintenance	
	Raw material management	Ensuring draft material balance of RKAP
	Raw material formulation	
	Cost management	Drafting the budget related to other work units
	Cost-benefit analysis	
Ensuring management of production controlling including monitoring production relization and stock of product, ralization use of raw materials, auxiliary materials, utility, and stock of raw materials available in Departemen Produksi II A	Production target	Ensuring production realization, stock and product mutation in Departemen Produksi II A based on the assigned target
	PPIC	
	Raw material management	
	Raw material formulation	Inserting realization use of raw materials, auxiliary materials, stock, utility, mutation and balancing raw material in Departemen Produksi II A based on the assigned target
	Raw material management	
	Cost management	Ensuring use of general use budget and maintenance service in Dept. Produksi IIA
	Cost-benefit analysis	

Table 4. 31 Knowledge in Activity of Unit Production Planning and Control IIA(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring plan of other products packaging and moving factory's waste in the scope of Departemen Produksi II A to the area assigned by management	SMK3 management	Ensuring are condition/environment of factory in Dep. Produksi IIA
	SML Management	
	Safety compliance	
	SML Management	Ensuring water waste concentration (pH) in Dept. Produksi IIA
	Waste control management	
	SML Management	Ensuring location and execution material. Ex. Maintenance of factory area
	Waste control management	
Ensuring the management of outsourcing job (cleaning factory area and supporting operational) including finishing administration process and supervision with production unit in the scope of Departemen Produksi II A	SML Management	Inserting cost estimationof area maintenance and equipment in Dep. Produksi IIA
	Cost management	
	Equipment maintenance	Ensuring making of RKS and requirement of job service of area maintenance and equipment in Dep. Produksi II
	SMK3 management	
	Owner estimation	
Ensuring draft and report presentation in regular or insidentil on implementation of Work Planin the scope of Perencanaan & Pengendalian Produksi II A with related parties	Cost management	Delivering budget achievement in Dep. Produksi IIA
	Cost-benefit analysis	
	Raw material management	Ensuring mutation (receiving and delivering) raw materials based on demand
	Production target	Ensuring production relization of fertilizer non subsidy based on the demand
	Production management	
	Communication management	Inserting draft and delivering daily, monthly and annual report in Dep Produksi IIA
	Production target	

Table 4. 32 Knowledge in Activity of Unit Production Planning and Control IIA(cont')

ACTIVITY	KNOWLEDGE	KNOWLEDGE EXPLANATION
Ensuring management useof General Use budget and service budget in Dep. Produksi II A	Cost management	Ensuring procurment and supporting operational needs of factory based on budget
	Cost-benefit analysis	
	Communication management	
	Technology proses	
	Cost management	Inserting budget realization General Use and Service based on the assigned target
	Owner estimation	

4.5   **Critical Knowledge Criteria Determination**

Critical knowledge criteria determination is done by 2 stages, gathering the criteria and assess the criteria. Here is the explanation for critical knowledge criteria determination

4.5.1   **Critical Knowledge Criteria Parameter**

As well as expert criteria determination, critical knowledge criteria determination also has done through brainstroming result from several parties. Here is the explanation.

4.5.1.1 Critical Knowledge Criteria from Organization and Procedure Department

As the main unit in reponsbility of KM system's in PT. Petrokimia Gresik, Organization and Procedure Department try to formulate the critical knowledge criteria. Here is the recapitulation and explanation.

Table 4. 33 Critical Knowledge Criteria from Organization and Procedure Dept.

Source	No	Parameter	Type	Explanation
Organisasi dan Prosedur (Ordur) Department	1	Level of importance	Kecil	Pengetahuan yang apabila tidak dimiliki karyawan akan tidak/sedikit berpengaruh pada pencapaian kinerja perusahaan
			Sedang	Pengetahuan yang apabila tidak dimiliki karyawan akan berpengaruh pada pencapaian kinerja perusahaan atau dapat menggangu operasional pekerjaan
			Tinggi	Pengetahuan yang apabila tidak dimiliki karyawan akan berpengaruh besar pada pencapaian kinerja perusahaan atau menyebabkan target perusahaan bisa tidak tercapai.
	2	Level of easiness	Mudah	Pengetahuan yang mudah untuk didapatkan seperti melalui media yang diterbitkan untuk umum (buku, majalah, buku, laporan) atau *website* umum
			Sedang	Pengetahuan yang cukup sulit untuk didapatkan seperti berasal dari media yang diterbitkan untuk kalangan terbatas atau *private website*
			Sulit	Pengetahuan yang sulit untuk didapatkan. Bersifat unik. Tidak tersedia, namun diperoleh berdasarkan pengalaman, penelitian, dan lainnya.

4.5.1.2 Critical Knowledge Criteria from Production IIA Department

      As the observer unit of this research, Production IIA Department also try to formulate the critical knowledge criteria. Here is the recapitulation and explanation.

Table 4. 34 Critical Knowledge Criteria from Production IIA Department

Source	No	Parameter	Type	Explanation
Production IIA Department	1	Level of easiness	Mudah	Pengetahuan tersebut mudah untuk disharingkan sesama departemen lain (misal telah tertulis di dalam peraturan perusahaan)
			Sedang	Pengetahuan tersebut cukup sulit untuk disharingkan sesama departemen lain (harus melalui rapat khusus)
			Sulit	Pengetahuan tersebut sangat sulit untuk disharingkan sesama departemen lain (misal melalui rapat rutin)
	2	Level of importance	Cukup	Pengetahuan yang apabila dimiliki karyawan akan sedikit berpengaruh bagi pencapaian kinerja perusahaan
			Penting	Pengetahuan yang apabila dimiliki karyawan akan berpengaruh bagi pencapaian kinerja perusahaan
			Sangat penting	Pengetahuan yang apabila dimiliki karyawan akan berpengaruh secara signifikan bagi pencapaian kinerja perusahaan

4.5.1.3 Critical Knowledge Criteria from Other Resource

      In other hand, other proven reference also used as the consideration in critical knowledge criteria determination.

Table 4. 35 Critical Knowledge Criteria from Other Resource

Source	No.	Thematic Axes	Code	Criteria
A journal (Critical Knowledge Map as a Decision Tool for Knowledge Transfer Actions)	1	Rarity	1a	Number and availability of experts
			1b	Externalization
			1c	Leadership
			1d	Originality
			1e	Confidentiality (kerahasiaan)
	2	Utility	2a	Corresponding to strategic objectives
			2b	Value creation
			2c	Emergence
			2d	Adaptability

Table 4. 36 Critical Knowledge Criteria from Other Resource (cont')

Source	No.	Thematic Axes	Code	Criteria
A journal (Critical Knowledge Map as a Decision Tool for Knowledge Transfer Actions)	2	Utility	2e	Use
	3	Difficulty to capture knowledge	3a	Identification of knowledge sources
			3b	Mobilization of networks
			3c	Tacit knowledge
			3d	Importance of tangible knowledge source
			3e	Rapidity of obsolence
	4	Nature of Knowledge	4a	Depth
			4b	Complexity
			4c	Difficulty of appropriation
			4d	Importance of past experiences
			4e	Environment dependency

Table 4. 37 Selected Criteria for Critical Knowledge Determination

Source	No.	Thematic Axes	Code	Criteria
A journal (Critical Knowledge Map as a Decision Tool for Knowledge) Transfer A ctions	1	Rarity	1a	Number and availability of experts
			1b	Externalization
			1c	Leadership
			1d	Originality
			1e	Confidentiality (kerahasiaan)
	2	Utility	2a	Corresponding to strategic objectives
			2b	Value creation
			2c	Emergence
			2d	Adaptability
			2e	Use
	3	Difficulty to capture knowledge	3a	Identification of knowledge sources
			3b	Mobilization of networks
			3c	Tacit knowledge
			3d	Importance of tangible knowledge source
			3e	Rapidity of obsolence
	4	Nature of Knowledge	4a	Depth
			4b	Complexity
			4c	Difficulty of appropriation
			4d	Importance of past experiences
			4e	Environment dependency

From the brainstroming result, table 4.24 is the selected criteria for critical knowledge determination. These criteria will be used to determine critical knowledge for the observer unit.

4.5.2 Critical Knowledge Criteria Testing

From the results of critical knowledge formulation then the next stpe os performed an assessment on the proposed criteria for each criteria. Assessment done by distributing questionnaires to employees of selected two units, namely Unit Phosphate I and Unit Production Planning and Control IIA . Questionnaires can be seen in Enclosure.

From the questionnaire results, obtained the data that will be input into 3 types of testing, Adequacy Data Testing, Validity Testing dan Reliability Testing. The results of the third test will be used as the basis for assessment predetermined knowledge .

4.5.2.1 Adequacy Data Testing

Adequact data testing is used to determine whether the number of samples taken is enough to data processing in the next process or not. Adequacy data testing using equations as shown below.

$$N' \geq \frac{(Z_{\alpha/2})^2 p.q}{e^2}$$

note:

N' : minimum number of sample

α : level of significant (5%)

$Z_{\alpha/2}$: normal distribution value (1,96)

e : error tolerance (usually used 10%)

p : the proportion of the amount of data that is according to the provisions

q : the proportion of the amount of data that is not according to the provisions

First determined an acceptable level of data with a formula :

$$\text{Total number of respondent answer} \geq \pi r^2 \frac{\text{Criterion} \times \text{Number of dimension}}{2}$$

From that formulation, thus the result is

$$x \geq \frac{20 \times 5}{2}$$

$$56 \geq \frac{20 \times 5}{2} \ldots \ldots \ldots (Yes)$$

Thus the data will be categorized as accepted data if the total number of answer is ≥ 50. Table 4.25 is the recapitulation of respondent's answers.

There are 2 respondents who do not meet the criteria, thus to see if the data obtained has fulfilled or not, then the calculation using previous formula:

$$p = \frac{28}{30} \quad q = \frac{2}{30}$$

$$30 \geq \frac{1,962 \times \frac{28}{30} \times \frac{2}{30}}{(0,1)2}$$

$$30 \geq 23,9032888$$

It can be concluded that the samples taken is sufficient to qualify the adequacy of data testing. For information, the 30 respondents are taken from the selected unit using questionnaire like shown in Enclosure 4.

Table 4. 38 The result of Adequacy Data Test by using Microsoft Excel

Respondent	Rarity					Utility					Difficulty to capture knowledge					Nature of Knowledge					x	
	Number and availability of experts	Externalization	Leadership	Confidentiality	Originality	Corresponding to strategic objectives	Value creation	Emergence	Adaptability	Use	Identification of knowledge sources	Mobilization of networks	Tacit knowledge	Importance of tangible knowledge source	Rapidity of obsolence	Depth	Complexity	Difficulty of appropriation	Importance of past experiences	Environment dependency	x	
1	3	4	4	2	4	4	2	2	4	4	3	2	2	2	3	3	1	3	2	2	56	Yes
2	2	2	4	1	2	1	3	3	4	2	1	3	1	1	2	3	2	4	1	1	43	No
3	3	3	3	2	4	3	4	4	3	1	1	1	2	2	1	3	3	4	1	2	50	Yes
4	3	2	2	1	4	4	4	4	4	1	1	3	2	2	1	3	2	4	2	1	50	Yes
5	2	3	4	2	4	4	4	3	3	4	1	1	2	2	1	3	2	3	2	2	52	Yes
6	3	4	3	2	4	4	3	2	2	3	3	3	1	1	1	4	1	4	3	2	53	Yes
7	3	2	3	3	3	4	3	4	3	2	2	1	3	3	1	1	2	4	3	3	53	Yes
8	4	2	4	1	3	2	4	4	4	2	2	4	2	2	2	3	3	4	3	1	56	Yes
9	3	4	4	1	3	4	3	3	3	2	2	3	3	2	2	3	1	2	4	2	54	Yes
10	4	1	4	1	3	4	2	3	4	1	2	1	3	3	1	4	1	4	3	1	51	Yes
11	4	2	4	1	4	3	2	2	1	4	2	2	3	3	2	4	3	4	3	1	54	Yes
12	4	4	3	2	4	2	4	3	3	1	1	3	1	1	1	4	1	2	4	2	50	Yes
13	4	3	4	2	4	4	4	1	4	3	2	1	4	4	1	4	2	4	2	2	59	Yes
14	3	3	3	2	4	4	4	3	4	2	1	3	2	2	1	3	1	3	1	2	51	Yes
15	3	2	4	1	3	4	3	4	3	1	1	3	2	2	3	3	1	4	2	1	50	Yes
16	3	1	3	1	3	3	4	4	4	2	3	2	1	2	3	3	2	4	2	1	51	Yes
17	3	4	4	2	3	3	4	3	3	1	4	1	3	3	3	3	1	3	1	2	54	Yes
18	3	3	4	2	4	3	4	4	4	1	1	4	1	1	2	3	2	4	4	2	56	Yes
19	4	4	4	2	4	4	4	3	4	2	1	3	1	1	1	4	1	4	1	2	53	Yes
20	4	4	4	2	4	1	4	2	3	1	1	4	3	2	2	3	1	4	1	1	51	Yes
21	4	2	4	1	4	3	4	4	4	1	2	3	1	1	2	4	1	4	2	1	52	Yes
22	4	2	3	1	4	3	4	4	4	1	1	1	1	1	1	3	2	3	1	1	45	No
23	3	2	3	2	4	4	4	3	4	2	2	2	1	1	4	4	1	3	1	2	52	Yes
24	3	3	1	2	4	3	3	4	4	2	3	1	1	1	2	4	3	4	2	2	52	Yes
25	3	2	1	2	4	4	4	4	4	1	1	3	1	1	3	3	2	4	1	2	50	Yes
26	4	2	4	2	4	4	4	4	4	3	4	3	3	3	1	3	2	3	2	2	61	Yes
27	4	4	4	2	3	3	4	4	3	4	3	1	2	2	2	3	3	4	3	2	60	Yes
28	4	3	3	2	4	4	4	3	4	2	2	4	1	1	2	4	4	4	4	2	60	Yes
29	3	1	4	2	3	4	4	4	4	3	3	3	2	2	2	4	4	4	2	2	60	Yes
30	3	4	3	2	4	3	3	3	4	2	3	1	1	1	2	4	1	4	1	2	51	Yes

4.5.2.2 Validity Testing

This test is done by using software Microsoft Excel with the following steps are:

1. From the result of adequcy data testing, then sum all the value in every criteria

2. Calculate R by using =PEARSON(drag seluruh nilai kriteria;drag seluruh nilai x)

3. Compare the result of step 2 with R table

   R_{table} for 30 questionnaire is 0,361. If $R_{hitung}>R_{tabel}$, then the criteria is valid. The recapitulation is shown below.

As shown n table 4.26 above, there are 10 criteria which is proven as valid criteria and 10 criteria are not. Ten valid criteria are:

1. Number and availability of experts (Rarity)
2. Confidentiality (Rarity)
3. Corresponding to strategic objectives (Utility)
4. Use (Utility)
5. Identification of knowledge sources (Difficulty to capture knowledge)
6. Tacit knowledge (Difficulty to capture knowledge)
7. Importance of tangible knowledge source (Difficulty to capture knowledge)
8. Complexity (Nature of Knowledge)
9. Importance of past experiences (Nature of Knowledge)
10. Environment dependency (Nature of Knowledge)

Those 10 valid criteria will become an input to the reliability testing.

Table 4. 39 The result of Validity Test by using Microsoft Excel

Respondent	Rarity					Utility					Difficulty to capture knowledge					Nature of Knowledge					x	
	Number and availability of experts	Externalization	Leadership	Confidentiality	Originality	Corresponding to strategic objectives	Value creation	Emergence	Adaptability	Use	Identification of knowledge sources	Mobilization of networks	Tacit knowledge	Importance of tangible knowledge source	Rapidity of obsolence	Depth	Complexity	Difficulty of appropriation	Importance of past experiences	Environment dependency		
1	3	4	4	2	4	4	2	2	4	4	3	2	2	2	3	3	1	3	2	2	56	Yes
2	2	2	4	1	2	1	3	3	4	2	1	3	1	1	2	3	2	4	1	1	43	No
3	3	3	3	2	4	3	4	4	3	1	1	1	2	2	1	3	3	4	1	2	50	Yes
4	3	2	2	1	4	4	4	4	4	1	1	3	2	2	1	3	2	4	2	1	50	Yes
5	2	3	4	2	4	4	4	3	3	4	1	1	2	2	1	3	2	3	2	2	52	Yes
6	3	4	3	2	4	2	3	2	2	3	3	3	1	1	1	4	1	4	3	2	53	Yes
7	3	2	3	3	3	4	3	4	3	2	2	1	3	3	1	1	2	4	3	3	53	Yes
8	4	2	4	1	3	2	4	4	4	2	2	4	2	2	2	3	3	4	3	1	56	Yes
9	3	4	4	1	3	4	3	3	3	2	2	3	3	2	2	3	1	2	4	2	54	Yes
10	4	1	4	1	3	4	2	3	4	1	2	1	3	3	2	4	1	4	3	1	51	Yes
11	4	2	4	1	4	3	2	2	1	4	2	2	3	3	2	4	3	4	3	1	54	Yes
12	4	4	3	2	4	2	4	3	3	1	1	3	1	1	1	4	1	2	4	2	50	Yes
13	4	3	4	2	4	4	4	1	4	3	2	1	4	4	1	4	2	4	2	2	59	Yes
14	3	3	3	2	4	4	4	3	4	2	1	3	2	2	1	3	1	3	1	2	51	Yes
15	3	2	4	1	3	4	3	4	3	1	1	3	2	2	3	3	1	4	2	1	50	Yes
16	3	1	3	1	3	3	4	4	4	2	3	2	1	2	3	3	2	4	2	1	51	Yes
17	3	4	4	2	3	3	4	3	3	1	4	1	3	3	3	3	1	3	1	2	54	Yes
18	3	3	4	2	4	3	4	4	4	1	1	4	1	1	2	3	2	4	4	2	56	Yes
19	4	4	3	2	4	4	4	3	4	2	1	3	1	1	1	4	1	4	1	2	53	Yes
20	4	4	4	2	4	1	4	2	3	1	1	4	3	2	2	3	1	4	1	1	51	Yes
21	4	2	4	1	4	3	4	4	4	1	2	3	1	1	2	4	1	4	2	1	52	Yes
22	4	2	3	1	4	3	4	4	4	1	1	1	1	1	1	3	2	3	1	1	45	No
23	3	2	3	2	4	4	4	3	4	2	2	2	1	1	4	4	1	3	1	2	52	Yes
24	3	3	1	2	4	3	3	4	4	2	3	1	1	1	2	4	3	4	2	2	52	Yes
25	3	2	1	2	4	4	4	4	4	1	1	3	1	1	3	3	2	4	1	2	50	Yes
26	4	2	4	2	4	4	4	4	4	3	4	3	3	3	1	3	2	3	2	2	61	Yes
27	4	4	4	2	3	3	4	4	3	4	3	1	2	2	2	3	3	4	3	2	60	Yes
28	4	3	3	2	3	4	4	3	4	2	2	4	1	1	2	4	4	4	4	2	60	Yes
29	3	1	4	2	3	4	4	4	4	3	3	3	2	2	2	4	4	4	2	2	60	Yes
30	3	4	3	2	4	3	3	3	4	2	3	1	1	1	2	4	1	4	1	2	51	Yes
Total	100	82	101	51	108	100	107	98	106	61	59	70	56	55	56	100	56	109	64	51		
R tabel	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361	0,361		
R hitung	0,3661	0,1296	0,3095	0,3689	0,0146	0,3813	0,1332	-0,099	0	0,5172	0,5543	0,1203	0,3656	0,3846	$1E-17$	0,1369	0,4036	0,0535	0,4342	0,415		
Conclusion	V	NV	NV	V	NV	V	NV	NV	NV	V	V	NV	V	V	NV	NV	V	NV	V	V		

84

4.5.2.3 Reliability Testing

Reliability testing conducted to ascertain whether the criteria that has been deployed and stated as valid criteria is reliable or not. It can be said as reliable criteria and questionnaire if the results are always similar in every test.

In the reliability testing, the data used is only valid criteria. Reliability testing is done by using SPSS software. The steps in the test are:

1. Input valid criteria into SPSS
2. Click Analyze > Scale > Reliability Analysis > Input all the data > OK
3. If the α croncbach > R_{tabel} then reliable or if α croncbach < α croncbach based on standardized items.
4. If the data is not reliable, thus it must be create a new questionnaire.

Here is the result of reliability testing using SPSS.

Table 4. 40 Analysis Result of SPSS for testing reliability

Criteria	α croncbach	R table	Status
Number and availability of experts	0,667	0,361	Reliable
Confidentiality	0,646	0,361	Reliable
Corresponding to strategic objectives	0,641	0,361	Reliable
Use	0,579	0,361	Reliable
Identification of knowledge sources	0,618	0,361	Reliable
Tacit knowledge	0,611	0,361	Reliable
Importance of tangible knowledge source	0,595	0,361	Reliable
Complexity	0,662	0,361	Reliable
Importance of past experiences	0,659	0,361	Reliable
Environment dependency	0,631	0,361	Reliable

(Source: Enclosure 5)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.658	.664	10

Figure 4. 5 The Result of SPSS (Enclosure 5)

Based on table 4.27 and figure 4.6, thus the questionnaire and criteria is stated as reliable. Thus, this result will be used as input data to the next steps.

4.5.3 Critical Knowledge Criteria Weighting

After determined the appropriate and tested criteria, thus the weighting has to be done. The weighting is done by Organization and Procedure Department.

Table 4. 41 Critical Knowledge Criteria Weighting

Thematic Axes	Weight	Criteria	Weight
Rarity	0,061	Number and availability of experts	0,25
		Confidentiality	0,75
Utility	0,626	Corresponding to strategic objectives	0,5
		Use	0,5
Difficult to capture	0,14	Identification of knowledge sources	0,105
		Tacit knowledge	0,637
		Importance of tangible knowledge source	0,258
Nature of knowledge	0,172	Complexity	0,584
		Importance of past experiences	0,135
		Environment dependency	0,281

4.6 Critical Knowledge

After all data has been processed, the next step is doing the knowledge's assessment. This assessment is done through the interviewing the expert of every selected unit. Previously the deal had done, where a knowledge classified into critical knowledge has a weighs at least 70 %. The recapitulation is shown in table 4.29.

Table 4. 42 Assessment of Knowledge

No.	Knowledge	Rarity		Utility		Difficult to capture			Nature of knowledge			Weight	%	Status
		1		2		3			4					
		0,061		0,626		0,14			0,172					
		Number and availability of experts	Confidentiality (kerahasiaan)	Corresponding to strategic objectives	Use	Identification of knowledge sources	Tacit knowledge	Importance of tangible knowledge source	Complexity	Importance of past experiences	Environment dependency			
		a	b	a	b	a	b	c	a	b	c			
		0,25	0,75	0,5	0,5	0,105	0,637	0,258	0,584	0,135	0,281			
1	Auditing management	3	3	3	1	4	4	3	4	1	2	2,48056	62,08%	-
2	Communication management	1	2	4	4	1	4	4	2	4	3	3,56542	89,22%	Critical
3	Continuous improvement planning	2	3	4	2	3	3	2	4	3	3	3,04608	76,23%	Critical
4	Control room operation system	1	3	3	4	1	1	3	1	2	1	2,75096	68,84%	-
5	Cost management	3	3	4	4	3	4	4	4	4	4	3,9203	98,11%	Critical
6	Cost-benefit analysis	3	3	2	2	4	4	2	3	2	2	2,36721	59,24%	-
7	Customer service orientation	3	4	2	2	4	4	2	1	3	2	2,23528	55,94%	-
8	Electrical installation	4	2	2	2	3	3	3	3	3	2	2,29217	57,36%	-
9	Environmental health	2	2	2	3	2	1	2	1	2	3	2,1697	54,30%	-
10	Equipment maintenance	4	2	4	4	4	4	4	3	4	1	3,65906	91,57%	Critical
11	Equipment monitoring control	2	2	3	3	2	2	2	2	3	1	2,59889	65,04%	-
12	Equipment operation	2	2	3	4	2	2	3	2	2	1	2,92479	73,19%	Critical
13	Equipment performance evaluation	3	3	3	3	3	3	4	2	4	1	2,85923	71,55%	Critical
14	Forecasting	3	3	3	3	2	2	3	2	4	2	2,76756	69,26%	-
15	Human assurance	2	4	2	2	3	3	2	2	1	1	2,12183	53,10%	-
16	Innovation management	3	4	4	2	4	4	2	4	4	3	3,23418	80,94%	Critical
17	Manufacturing control	2	3	4	4	2	1	4	2	4	3	3,37358	84,42%	Critical
18	Operation process	1	3	2	3	2	1	3	2	2	2	2,28844	57,27%	-
19	Operational Procedure	1	1	2	3	1	1	2	1	1	2	2,02245	50,61%	-
20	Owner estimation	4	4	2	1	1	3	1	4	1	1	1,9747	49,42%	-
21	Panel board system operation	1	3	2	3	1	1	3	2	2	1	2,22541	55,69%	-
	Maximum weight	4	4	4	4	4	4	4	4	4	4	3,996		

Table 4.29 Assessment of Knowledge (cont')

No.	Knowledge	Rarity		Utility		Difficult to capture			Nature of knowledge			Weight	%	Status
		1		2		3			4					
		0,061		0,626		0,14			0,172					
		Number and availability of experts	Confidentiality (kerahasiaan)	Corresponding to strategic objectives	Use	Identification of knowledge sources	Tacit knowledge	Importance of tangible knowledge source	Complexity	Importance of past experiences	Environment dependency			
		a	b	a	b	a	b	c	a	b	c			
		0,25	0,75	0,5	0,5	0,105	0,637	0,258	0,584	0,135	0,281			
22	PPIC	3	4	4	4	3	3	4	4	4	2	3,78021	94,60%	*Critical*
23	Process quality control	2	4	4	3	2	2	3	3	2	3	3,2134	80,42%	*Critical*
24	Product knowledge	1	4	4	3	1	1	4	1	3	1	2,85605	71,47%	*Critical*
25	Product quality control	2	3	4	4	2	3	4	3	4	2	3,60406	90,19%	*Critical*
26	Production management	2	4	2	3	2	2	3	2	2	1	2,39029	59,82%	-
27	Production process	3	3	3	3	2	2	3	3	4	1	2,81968	70,56%	*Critical*
28	Production system control	2	2	2	2	2	2	3	2	2	1	1,98579	49,69%	-
29	Production target	1	2	4	4	4	3	4	2	4	2	3,47201	86,89%	*Critical*
30	Raw material formulation	1	2	4	4	4	1	4	4	4	1	3,44621	86,24%	*Critical*
31	Raw material management	2	2	2	3	3	3	2	2	3	3	2,486432	62,22%	-
32	Risk management	2	2	2	2	3	3	2	1	2	2	2,00143	50,09%	-
33	Safety compliance	2	2	2	2	2	3	2	1	1	3	2,01184	50,35%	-
34	SMK3 management	2	2	2	3	1	1	2	1	1	3	2,13178	53,35%	-
35	SML Management	2	2	2	3	1	1	2	1	2	3	2,155	53,93%	-
36	SSM Management	2	2	2	3	1	1	2	1	3	1	2,08156	52,09%	-
37	Stream days monitoring control	2	3	4	4	2	3	4	4	4	2	3,70451	92,71%	*Critical*
38	Technical procedure	1	1	2	3	1	2	2	1	2	2	2,13485	53,42%	-
39	Process technology	4	2	2	2	1	2	2	4	1	1	2,14314	53,63%	-
40	Training management	4	3	2	2	3	4	3	4	3	1	2,47921	62,04%	-
41	Utility quality control	2	3	2	3	1	2	3	1	2	1	2,22939	55,79%	-
42	Waste control management	4	2	2	3	2	1	2	1	2	4	2,24854	56,27%	-
	Maximum weight	4	4	4	4	4	4	4	4	4	4	3,996		

From the assessment result, it was found that there are 16 kinds of knowledge classified as critical knowledge, as shown in tabe 4.30 below.

Table 4. 43 Critical Knowledge

No.	Critical Knowledge	No.	Critical Knowledge
1	Communication management	9	PPIC
2	Continuous improvement planning	10	Process quality control
3	Cost management	11	Product knowledge
4	Equipment maintenance	12	Product quality control
5	Equipment performance evaluation	13	Production process
6	Equipment operation	14	Production target
7	Innovation management	15	Raw material formulation
8	Manufacturing control	16	Stream days monitoring control

4.7   OMAX

The testing result using OMAX is to assess whether critical knowledge has been determined is absoltely correct or not. The weight of critical knowledge which is in the area above the standard performance is the correct ones. Here is the result of interpolation and verification using OMAX models.

Level	Communication management	Continuous improvement planning	Cost management	Equipment maintenance	Equipment operation	Equipment performance evaluation	Innovation management	Manufacturing control	PPIC	Process quality control	Product knowledge	Product quality control	Production process	Production target	Raw material formulation	Stream days monitoring control
Performance	3,5654	3,0461	3,9203	3,6591	2,9248	2,8592	3,2342	3,3736	3,7802	3,2134	2,8561	3,6041	2,8197	3,4720	3,4462	3,7045
Target 10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
9	3,8428	3,8428	3,9571	3,9143	3,7571	3,8428	3,9143	3,8428	3,929	3,8286	3,7571	3,8714	3,8143	3,8571	3,8428	3,8857
8	3,6857	3,6857	**3,914**	3,8286	3,5143	3,6857	3,8286	3,6857	3,8571	3,6571	3,5143	3,7429	3,6286	3,7143	3,6857	**3,7714**
7	**3,529**	3,5286	3,8714	3,7429	3,2714	3,5286	3,7429	3,5286	**3,786**	3,4857	3,2714	**3,6143**	3,4429	3,5714	3,5286	3,6571
6	3,3714	3,3714	3,8286	**3,657**	**3,029**	3,3714	3,6571	**3,371**	3,7143	3,3143	3,0286	3,4857	3,2571	3,4286	**3,371**	3,5429
5	3,2143	3,2143	3,7857	3,5714	2,7857	3,2143	3,5714	3,2143	3,6429	**3,143**	**2,786**	3,3571	3,0714	3,2857	3,2143	3,4286
4	3,0571	**3,057**	3,7429	3,4857	2,5429	3,0571	3,4857	3,0571	3,1429	2,9714	2,5429	3,2286	**2,8857**	3,1429	3,0571	3,3143
Standard Performance (Average) 3	2,9000	2,9000	3,7000	3,4000	2,3000	**2,9000**	3,4000	2,9000	3,5000	2,8000	2,3000	3,1000	2,7000	3,0000	2,9000	3,2000
2	2,7429	2,7429	3,6571	3,3143	2,0571	2,7429	3,3143	2,7429	3,4286	2,6286	2,0571	2,9714	2,5143	2,8571	2,7429	3,0857
1	2,5857	2,5857	3,6143	3,2286	1,8143	2,5857	**3,229**	2,5857	3,3571	2,4571	1,8143	2,8429	2,3286	2,7143	2,5857	2,9714
Worst Performance (Min) 0	1	2	3	1	1	1	2	1	2	2	1	2	1	1	1	2

Figure 4. 6 Critical Knowledge Interpolation by using OMAX
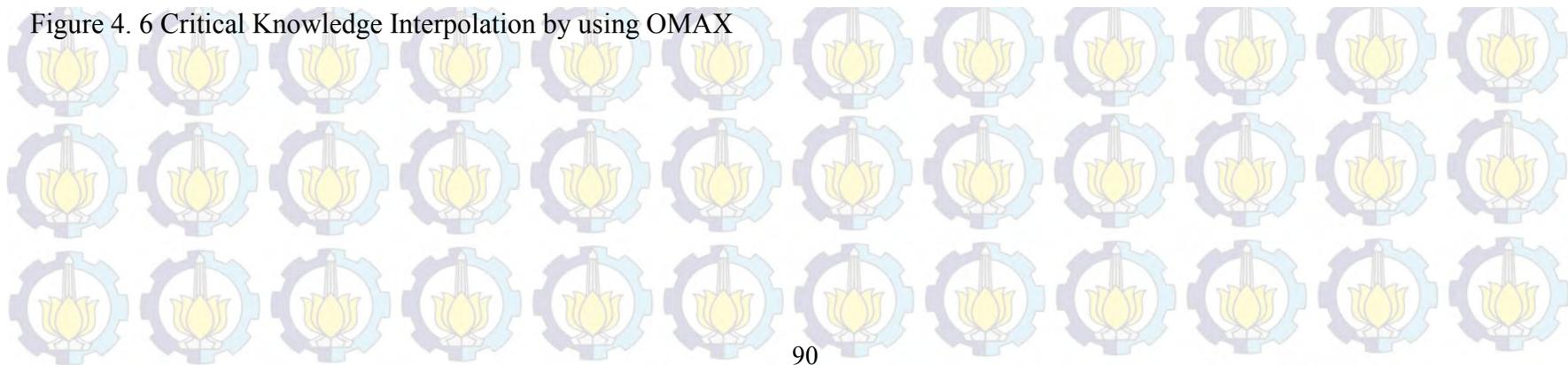
From the interpolation result, it was found that 2 knowledges is include in the area which is not defined as critical knowledge requirement. From this situation, the new recapitulation of critical knowledge is shown in table 4.31 below.

Table 4. 44 Recapitulation of Critical Knowledge based on OMAX result

Code	Critical Knowledge	Code	Critical Knowledge
K1	Communication management	K8	Process quality control
K2	Continuous improvement planning	K9	Product knowledge
K3	Cost management	K10	Product quality control
K4	Equipment maintenance	K11	Production process
K5	Equipment operation	K12	Production target
K6	Manufacturing control	K13	Raw material formulation
K7	PPIC	K14	Stream days monitoring control

4.8 Knowledge Mapping

From the critical knowledge determination in the previous sub-chapter, the next step should be done is mapping the critical knowledge into the unit or department related with that critical knowledge. Critical knowledge mapping can be seen as figure 4.7.

The figure 4.7 shows the relationship between the existing knowledge with relevant departments, both in the scope of production or not. This relationship indicates the closeness of the knowledge generated by other parties.
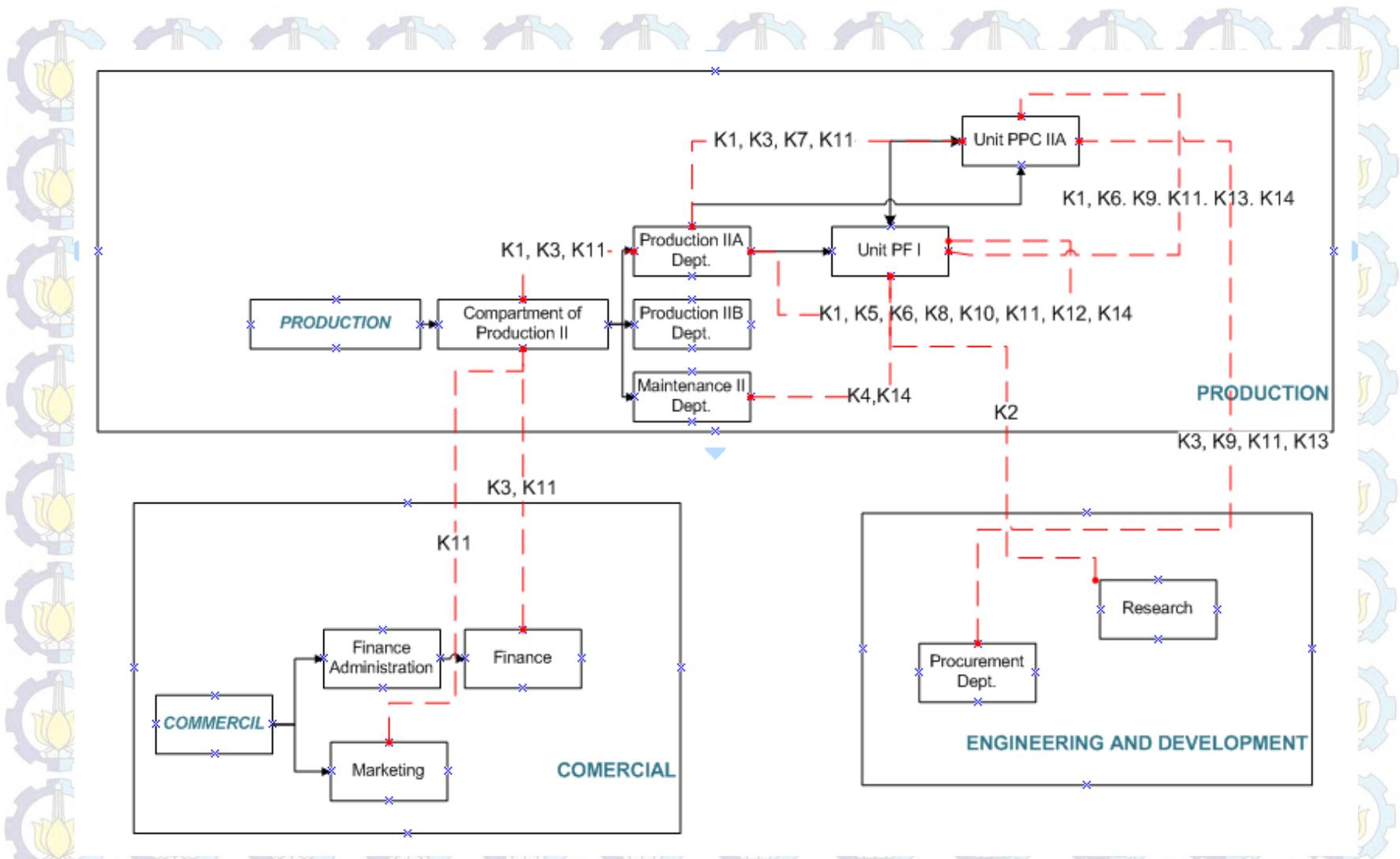
Figure 4. 7 Critical Knowledge Distribution Mapping

4.9 Mitigation of Critical Knowledge

The mitigation of critical knowledge is used to handle the critical knowledge from the negative effect. The mitigation result can be used as critical knowledge management for related units.

Table 4. 45 The Mitigation for Critical Knowledge Selected

Code	Critical Knowledge	Explanation	Avoid	Accept	Transfer	Diminish
K3	Cost management	Costs in the production process (covering all aspects)	Peer assists with the entire production team and also involves financial dept. for cost management	Reducing the things that can be minimized (use owner estimation)	Community of practice through regular meetings with the finance department	Evaluation regular meetings result with the maintenance department and Production Planning and Control IIA Dept.
K14	Stream days monitoring control	The number of days for the total production within a year	Peer assists with the entire production IIA and maintenance II	Mark up the working hours or engine capacity	Community of practice through regular meetings with the relevant unit	Community of practice through regular meeting with Finance Department
K1	Communication management	Sharing of information in order to control the development of production targets	Keep contact with all relevant units both through regular meetings and unformal meeting	-	Transfer all the knowledge of each unit of work in regular meetings	Regular meetings by requiring all participants of the meeting to follow
K4	Equipment maintenance	Maintenance of equipment / machinery production	Deepen employee's knowledge through training employees about equipment	Routine maintenance to avoid fatal damage	-	Routine maintenance to avoid fatal damage

Table 4. 46 The Mitigation for Critical Knowledge Selected (cont')

Code	Critical Knowledge	Explanation	Avoid	Accept	Transfer	Diminish
K5	Equipment operation	Operation of equipment / machinery production	Deepen employee's knowledge through training employees about equipment	-	Make a clear and detailed SOP	Monitoring and evaluation in the meeting
K6	Manufacturing control	Control of the production process	Conduct direct checking to the plant	-	Make a clear and detailed SOP	Evaluate how the operation in a meeting
K7	PPIC	Production and Planning of raw material and also the monitoring thw owned inventory	Keep contact with the procurement department	Manage the existing material for the efficient production process	Community of pracite through a meeting or discussion forums	Evaluation of the previous condition of the regular meetings with the Procurement Dept.
K10	Product quality control	Production quality control , whether or not in accordance with the standards	Doing controlling directly to the production unit	Do not include defective products into unit Packaging	Make a list of the correct product quality specifications	Evaluation in a meeting of Production IIA Department
K12	Production target	A minimal amount of fertilizer to be produced in one year	Direct ontrolling into the production Dept. And Procurement Dept.	Send output to the Marketing Department	Community of practice through meetings	Controlling directly into the production unit (plant)

94

Table 4. 47 The Mitigation for Critical Knowledge Selected (cont')

Code	Critical Knowledge	Explanation	Avoid	Accept	Transfer	Diminish
K13	Raw material formulation	Mixing of raw materials and auxiliary materials	Deepen the knowledge of employees through training	Does not include products containing wrong raw material mixing	Community of practice through meetings and make a SOP of mixing raw material	Controlling directly into the production unit (plant)
K2	Continuous improvement planning	Development of new methods in terms of production	Promote innovation program through training	Innovation in the context of efficiency production	Community of practice through meetings	-
K8	Process quality control	Control production activities to avoid improper quality	Direct ontrolling into production units and utilities	Make improvements to the next process	Community of practice through the company's innovation system	Evaluation in a meeting of Production IIA Department
K9	Product knowledge	Everything related products, both raw materials and production processes	Deepen the knowledge of employees through training	Do not include products that do not conform with the standard	Community of practice through meetings and creating a list of knowledge about the product (raw materials , quality standards)	Controlling directly into the production unit (plant)
K11	Production process	The process through which it makes a quality fertilizer	Doing controlling directly into production units and utilities	Make improvements to the next process	Community of practice through innovation system of company	Controlling directly into the production unit (plant)
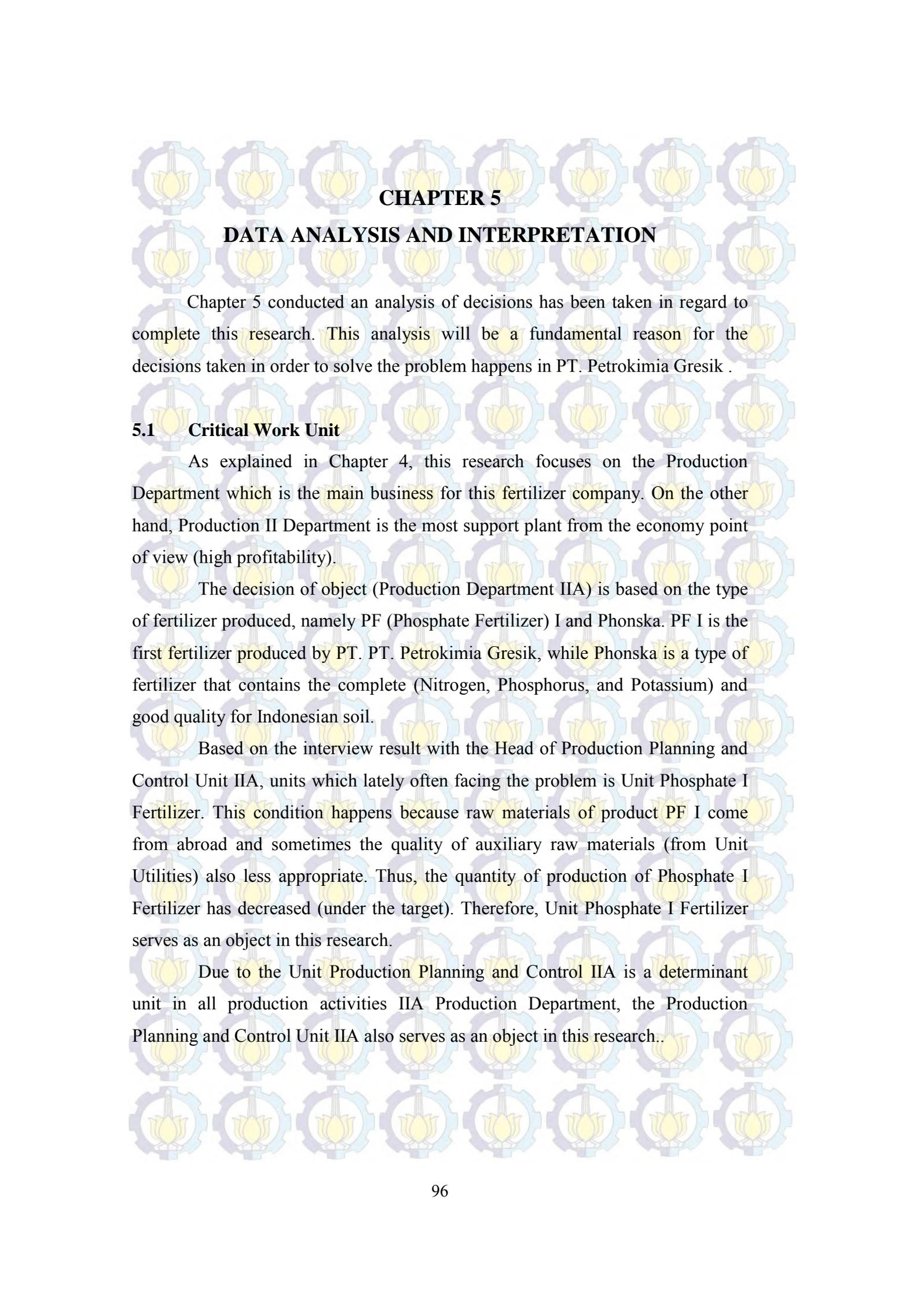
CHAPTER 5
DATA ANALYSIS AND INTERPRETATION

Chapter 5 conducted an analysis of decisions has been taken in regard to complete this research. This analysis will be a fundamental reason for the decisions taken in order to solve the problem happens in PT. Petrokimia Gresik .

5.1   Critical Work Unit

As explained in Chapter 4, this research focuses on the Production Department which is the main business for this fertilizer company. On the other hand, Production II Department is the most support plant from the economy point of view (high profitability).

The decision of object (Production Department IIA) is based on the type of fertilizer produced, namely PF (Phosphate Fertilizer) I and Phonska. PF I is the first fertilizer produced by PT. PT. Petrokimia Gresik, while Phonska is a type of fertilizer that contains the complete (Nitrogen, Phosphorus, and Potassium) and good quality for Indonesian soil.

Based on the interview result with the Head of Production Planning and Control Unit IIA, units which lately often facing the problem is Unit Phosphate I Fertilizer. This condition happens because raw materials of product PF I come from abroad and sometimes the quality of auxiliary raw materials (from Unit Utilities) also less appropriate. Thus, the quantity of production of Phosphate I Fertilizer has decreased (under the target). Therefore, Unit Phosphate I Fertilizer serves as an object in this research.

Due to the Unit Production Planning and Control IIA is a determinant unit in all production activities IIA Production Department, the Production Planning and Control Unit IIA also serves as an object in this research..

5.2 Expertise Criterion Determination

Expertise criterion formulated from several points of view: Diklat Department, Ordur Department, Plant II A Department, and also a journal written by Jean-Louis Ermine, Imed Boughzala and Thierno Tounkara, entitled "Critical Knowledge Map as a Decision Tool for Knowledge". From the results of brainstorming, then defined that there are 13 out of 18 criteria were chosen to be the basic criterion in the selection of expertise. While the rest is not appropriate.

The criteria which are not selected, among others:

- Be on time

  This is an obligation for each employee so that less suitable used as one of expertise's criterion.

- Parameter of SKI/PAK

  Parameter of SKI / PAK usually intended for a department / division / unit in determining to achieve their performance targets. For that reason, parameter of SKI / PAK is not suitable for use in determining expertise.

- Active in self-development activities

  Follow the activities of self-development is one of the criteria to determine the appropriate expertise. However, self-development activities are usually carried out through training held by the company. Therefore, it is obligatory to say, so this criteria is not a suitable point for the determination of expertise. On the other hand, certification criteria may represent the result of self-development of employees.

- Being a member of a special assignment team

  According to the interviews, there is no special team there (except for the innovation activity which is largely the initiative of individual employees). Any assignment given is the responsibility of the employees in accordance with the position of each.

- Make treatise

  Treatises produced from an activity called innovation. Thus, this criterion is already represented by other criteria.

In addition to the 18 criteria were analyzed, there is also the addition of 1 criteria is generated based on direct observation. The criterion is "Following the innovation activities (example: Sistem Saran). Many program and reward has been achieved by this company in terms of its innovation. Innovation activities carried out based on the type of work that employee's done. Therefore, the criteria have been selected as one of the expert criteria.

5.3 Assessment of Expert Criteria

Assessment in order to know the expertise is done through two ways:

1. Questionnaires directly to individuals
2. Interview with work-partner

This is because the type of expertise criterion contains two elements, assessment that can be known only individually and assessment that need to be judged by others.

Assessment that can be known only individually is fundamental from the employee regarding the level of education , studies that have been conducted or the results of real work ever done by themselves. While assessment that need to be judged by others is the assessment of employees's performance and also recognition of the performance from others.

5.4 Critical Knowledge Criterion Determination

As well as the determination of expert criterion, critical knowledge criterion determination also uses multiple viewpoints, which come from Ordur Department, Production Department IIA, and a journal entitled "Critical Knowledge Map as a Decision Tool for Knowledge".

There are 19 criteria were collected from several sources identified. But some of the criteria are ignored because:

- Level of importance (Ordur Department)
  These criteria have a common goal with the criteria "value creation" of the journal entitled "Critical Knowledge Map as a Decision Tool for Knowledge".

- Level of easiness (Ordur Department)

These criteria have a common goal with the criteria of "identification of knowledge sources" of the journal entitled "Critical Knowledge Map as a Decision Tool for Knowledge".

- Level of importance (Production IIA Department)

These criteria have a common goal with the criteria of "value creation" of the journal entitled "Critical Knowledge Map as a Decision Tool for Knowledge".

- Level of easiness (Production IIA Department)

These criteria have a common goal with the criteria of "identification of knowledge sources" of the journal entitled "Critical Knowledge Map as a Decision Tool for Knowledge".

From that three sources, decided 15 criteria which is accordance with the conditions of the company. Furthermore, the 15 criteria include in three kinds of test (adequacy data testing, validity testing, and reliability testing) through questionnaires. From that testing process, obtained that 10 criteria are valid and reliable. Those criteria then used as a basis in determining the weight of critical knowledge.

5.5   Critical Knowledge

Determination of critical knowledge is based on two aprroach which are using predetermined criteria and using OMAX as a form of validation.

The determination of critical knowledge using selected criterion is used to gather the information deeper based on company's condition. Based on company's condition, the criteria become more appropriate and useful to implement. On the other hand, the determination criteria from a journal is used to take the knowledge from trusted and tested source.

The function of using OMAX is to know whether the critical knowledge identified is the exact ones or not. By using minimum, maximum and average

value of every knowledge's assess, the position of knowledge will easily to be captured.

5.6   Critical Knowledge Mapping

Critical knowledge mapping is determine to capture the distribution of every critical knowledge determination. By using mapping, the source and the flow of critical knowledge can be known, thus if the problem happens from the activity of related unit, the source of critical knowledge can be tracked easily.
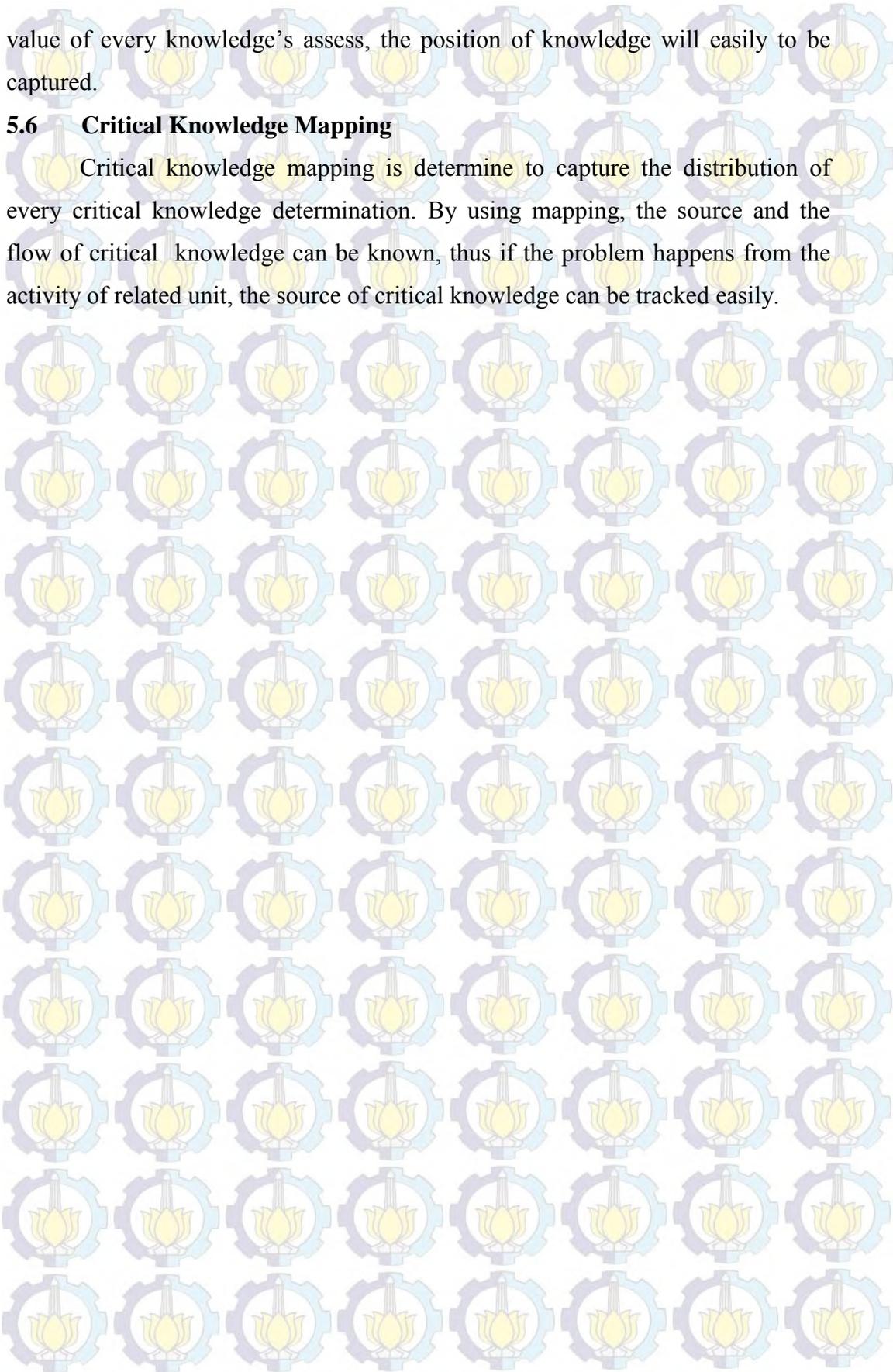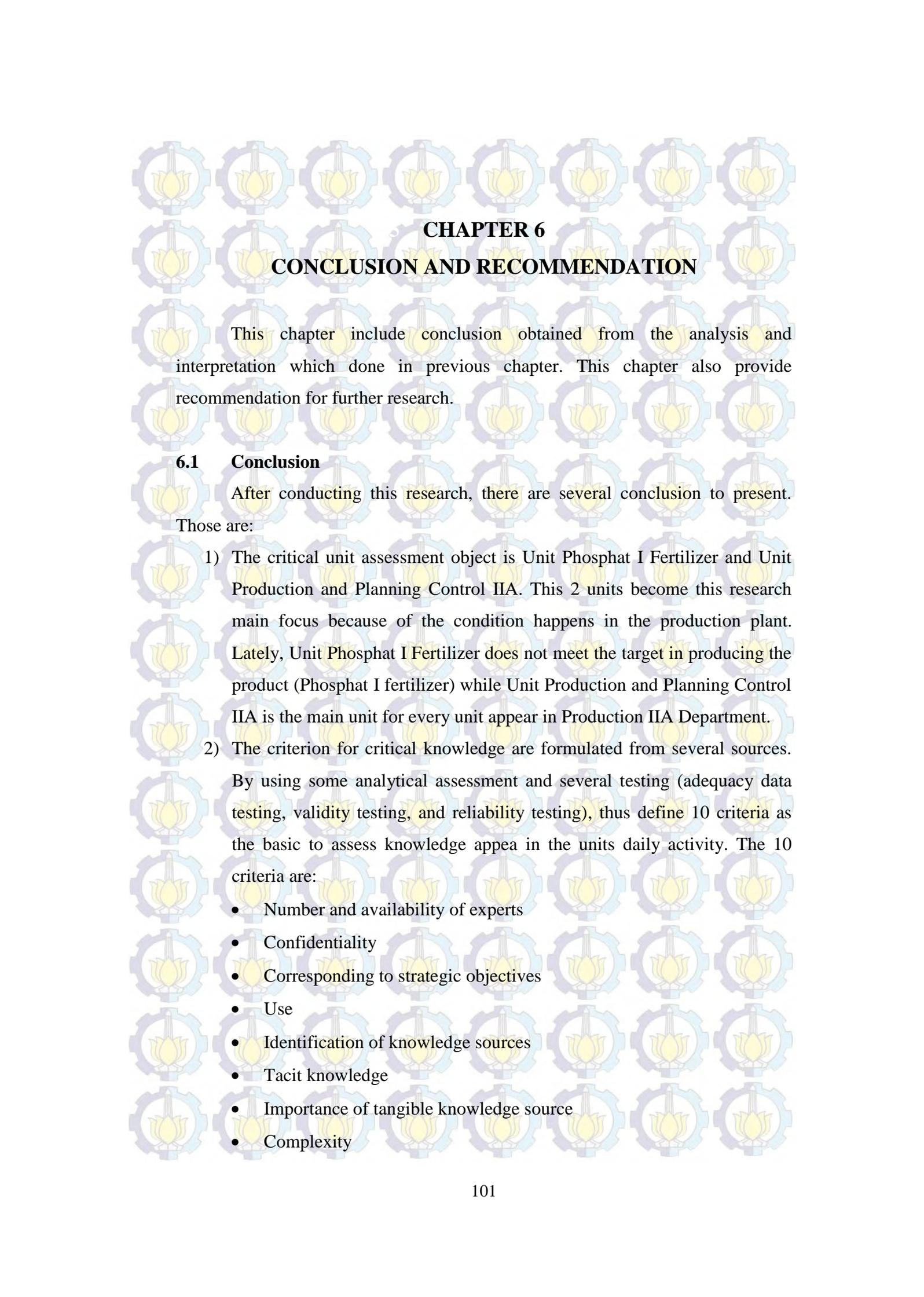
CHAPTER 6
CONCLUSION AND RECOMMENDATION

This chapter include conclusion obtained from the analysis and interpretation which done in previous chapter. This chapter also provide recommendation for further research.

6.1 Conclusion

After conducting this research, there are several conclusion to present. Those are:

1) The critical unit assessment object is Unit Phosphat I Fertilizer and Unit Production and Planning Control IIA. This 2 units become this research main focus because of the condition happens in the production plant. Lately, Unit Phosphat I Fertilizer does not meet the target in producing the product (Phosphat I fertilizer) while Unit Production and Planning Control IIA is the main unit for every unit appear in Production IIA Department.

2) The criterion for critical knowledge are formulated from several sources. By using some analytical assessment and several testing (adequacy data testing, validity testing, and reliability testing), thus define 10 criteria as the basic to assess knowledge appea in the units daily activity. The 10 criteria are:

- Number and availability of experts
- Confidentiality
- Corresponding to strategic objectives
- Use
- Identification of knowledge sources
- Tacit knowledge
- Importance of tangible knowledge source
- Complexity

- Importance of past experiences
- Environment dependency

3) By using criteria assessment and OMAX, the critical knowledge for this 2 observed units are:

- Communication management;
- Continuous improvement planning;
- Cost management;
- Equipment maintenance;
- Equipment performance evaluation;
- Equipment operation;
- Innovation management;
- Manufacturing control;
- PPIC;
- Process quality control;
- Product knowledge;
- Product quality control;
- Production process;
- Production target;
- Raw material formulation and
- Stream days monitoring control

6.2 Recommendation

The recommendation for this research is used to handle the critical knowledge appear. The mitigations in table 4.34 are used to handle its critical knowledge in related unit.

For future research, the risk management can be done to anticipate the critical knowledge appear. thus, it is suggested that for the next research the risk management can be prepared in complete procedure.

For PT. Petrokimia Gresik, it is better to choose a person for each department to audit the knowledge appear in related department, in term of knowing the condition happens in related departments.

REFERENCES

Ali Saleh S. Balaid, M.Z..M.Z.A.R., 2006. Journal od Information Systems Research and Innovation. *A Comprehensive Review of Knowledge Mapping Techniques*, pp.71-76.

Arbi, M.S., 2015. *Perancangan Sistem Knowledge Sharing berbasis Website dan Expertise Locator System sebagai Upaya Peningkatan Daya Saing pada PT. Petrokimia Gresik*. Tugas Akhir Bachelor. Surabaya: Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember.

Avianda, D., Yuniato, Y. & Yuniar, 2014. Strategi Peningkatan Produktivitas di Lantai Produksi Menggunakan OMAX. *Jurnal Online ITENAS*, 01(04), pp.202-13.

Bernard Marr, G.S.a.A.N., 2002. Assessing strategic knowledge assets in e-business. *Int.J. Business Performance Management* , 4, pp.279-95.

Dalkir, K., 2005. *Knowledge Management in Theory and Practice*. Oxford: Elsevier.

Dunamis Organizational Service, 2015. *Dunamis Organizational Service*. [Online] Available at: HYPERLINK "http://dunamis.co.id/" http://dunamis.co.id/ [Accessed 11 April 2015].

Elias M. Awad, H.M.G., 2004. *Knowledge Management*. New Jersey: Pearson Education Inc.

Ermine, J.L., Boughzala, I. & Tounkara, a.T., 2006. Critical Knowledge Map as a Decision Tool for Knowledge Transfer Actions. *Electronic Journal of Knowledge Management Volume 4 Issue 2*, pp.129-40.

Hadi, S., 2015. *Pengertian dan Contoh Angket atau Kuisioner*. [Online] Available at: HYPERLINK "http://www.maribelajarbk.web.id/" http://www.maribelajarbk.web.id/ [Accessed 11 April 2015].

Knoco, 2008. *Knowledge Assets*. [Online] Knoco Available at: HYPERLINK "http://www.knoco.com/" http://www.knoco.com/ [Accessed Wednesday 22 2015].

Lubis, A.T.S., 2014. *Identifikasi Kebutuhan Knowledge pada Dinas Line dan Cabin Maintenance PT. Garuda Maintenance Facility (GMF) Aerosia.* Tugas Akhir Bachelor. Surabaya: Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember.

Moulton, L.W., 2008. Knowledge audits: Establishing a context for leveraging knowledge. *In Knowledge Management in Practice: Connections and Context*, pp.79-93.

Naftanaila, I., 2012. Managing Knowledge Assets in Project Environments. *Journal of Knowledge Management, Economics and Information Technology*, (8), pp.1-9.

Pratiwi, A.A., 2014. *Pratiwi, A.A. (2014), Penyelarasan Knowledge Management dengan Performance Measurement System pada PT. Semen Indonesia (PERSERO) Tbk., Tugas Akhir Bachelor, Institut Teknologi Sepuluh Nopember, Surabaya.* Tugas Akhir Bachelor. Surabaya: Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember.

PT. Petrokimia Gresik, 2015. *A Report for PT. Petrokimia Gresik on 2014 Indonesia MAKE Study*. Company's Report. Gresik: Company.

PT. Petrokimia, 2014. *Laporan Aktivitas Divisi Knowledge Management*. Company's report. Gresik: Company.

Putri, A.A., 2015. *Perancangan Mekanisme Knowledge Sharing Triple Helix untuk Akselerasi Millenium Development Goals (MDGs) pada Asosiasi Pengelolaan dan Pemberdayaan Sanitasi Indonesia (APPSANI)*. Tugas Akhir Bachelor. Surabaya: Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember.

PWK Tech, 2014. *AHP*. [Online] Available at: HYPERLINK "http://www.pwktech.info/system-modeling/analytic-hierarchy-process-ahp/" http://www.pwktech.info/system-modeling/analytic-hierarchy-process-ahp/ [Accessed 2014 December 17].

Saaty, T.L., 1980. *The Analytical Hierarchy Process*. New York: McGraw.

Suyeon Kim, E.S.a.H.H., 2005-2006. Building the knowledge map: An industrial case study. *Journal of Knowledge Management*, pp.34-45.

Syairudin, B., 2015. *Audit Pengetahuan*. Lecture Handout: Manajemen
Pengetahuan. Surabaya: Institut Teknologi Sepuluh Nopember.

Tiwana, A., 1999. *The Knowledge Management Toolkit*. Prentice Hall PTR.

Universiti Teknologi Malaysia, 2008. Knowledge Audit Framework and Tool for
Institution og Higher Learning (IHL). *Research in Knowledge Management*,
p.178.

ENCLOSURE 1

Enclosure 1 Questionnare of Expert Parameter Weighting

Perkenalkan nama saya Aldilah Rifna Ghaisani, mahasiswi semester 8 Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember (ITS) Surabaya. Saat ini saya sedang dalam tahap penyelesaian Tugas Akhir dengan judul *"Identifying Critical Knowledge for KM Implementation Readiness in PT. Petrokimia Gresik"*. Dalam Tugas Akhir ini, saya berfokus kepada kegiatan *Knowledge Management* yang sedang berkembang di PT. Petrokimia Gresik. Penelitian ini bertujuan untuk membantu pihak objek amatan dalam menentukan *knowledge* kritis khususnya di departemen-departemen yang memiliki banyak sekali informasi atau pengetahuan.

Salah satu tahapan dalam penelitian ini ialah melakukan *assessment*. Terdapat 2 hal yang penilaiannya harus dilakukan berdasarkan sudut pandang pihak perusahaan:

1. Melakukan *assessment* terhadap kategori *expertise*
2. Melakukan *assessment* terhadap kategori-kategori *knowledge* kritis yang telah ditentukan.

Kedua data ini dibutuhkan sebagai dasar penentuan dalam proses selanjutnya yakni penentuan para ahli dan penentuan bobot *knowledge* kritis. Metode pembobotan yang digunakan yakni metode *Analytical Hierarchy Process* (AHP). Metode AHP dapat membandingkan kriteria baik secara individu ataupun berpasangan.

Berikut saya lampirkan beberapa kategori dalam penilaian. Saya mengharap kesediaan Bapak untuk menjadi narasumber saya terhadap tiap-tiap bulir lampiran kategori yang saya berikan dengan memberikan penilaian sesuai dengan kondisi perusahaan. Terima kasih atas ketersediaan dan kerjasama yang telah Bapak berikan.

Kuisioner ini diisi dengan menggunakan skala 1-9. Tiap-tiap skala memiliki definisi penilaian yang berbeda.

Tingkat Kepentingan	Keterangan
1	Kedua kategori sama penting
3	Satu kategori sedikit lebih penting daripada kategori lain
5	Satu kategori cukup lebih penting daripada kategori lain
7	Satu kategori jelas lebih penting daripada kategori lain
9	Satu kategori mutlak lebih penting daripada kategori lain
2,4,6,8	Nilai tengah diantara 2 penilaian yang berdampingan

Contoh:

Aspek	Sub-Aspek (*Expertise Criterion*)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sub-Aspek (*Expertise Criterion*)
Profile	Taraf pendidikan formal					√					√								Pendidikan pra-jabatan
																			Jumlah sertifikasi
					√														Memperoleh penghargaan

Artinya:

Taraf pendidikan formal cukup lebih penting dibanding pendidikan pra-jabatan, sedikit lebih penting dibanding jumlah sertifikasi dan jelas lebih penting dibandingkan memperoleh penghargaan.

Expertise's Categories

Aspek	Sub-Aspek (*Expertise Criterion*)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sub-Aspek (*Expertise Criterion*)
Profile	Taraf pendidikan formal																		Pendidikan pra-jabatan
																			Jumlah sertifikasi
																			Memperoleh penghargaan
	Pendidikan pra-jabatan																		Jumlah sertifikasi
																			Memperoleh penghargaan
	Jumlah sertifikasi																		Memperoleh penghargaan

Aspek	Sub-Aspek (*Expertise Criterion*)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sub-Aspek (*Expertise Criterion*)
Work Execution	Menjadi pembimbing karyawan dengan jabatan di bawahnya																		Menjadi narasumber dalam pertemuan
																			Nilai kompetensi
	Menjadi narasumber dalam pertemuan																		Nilai kompetensi

Aspek	Sub-Aspek (*Expertise Criterion*)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sub-Aspek (*Expertise Criterion*)
Research	Menjadi pembimbing mahasiswa yang penelitian																		Mengikuti kegiatan inovasi (misalnya: SS)
																			Menghasilkan instruksi kerja
	Mengikuti kegiatan inovasi (misalnya: SS)																		Menghasilkan instruksi kerja

Aspek	Sub-Aspek (*Expertise Criterion*)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sub-Aspek (*Expertise Criterion*)
Performance	Kontribusi ke unit kerja																		Kemampuan problem solving
																			Pengalaman yang dimiliki
																			Pengakuan rekan kerja
	Kemampuan problem solving																		Pengalaman yang dimiliki
																			Pengakuan rekan kerja
	Pengalaman yang dimiliki																		Pengakuan rekan kerja

Critical Knowledge's Categories

Thematic Axes	Criteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Criteria
Rarity (aneh, jarang)	Jumlah dan ketersediaan para ahli																		*Originality*
																			Confidentiality (kerahasiaan)
	Originality [Kebenaran dalam pengetahuan (dari segi lapangan/pabrik)]																		*Confidentiality* (kerahasiaan)

Thematic Axes	Criteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Criteria
Utility (Kegunaan)	*Corresponding to strategic objectives* (Keselarasan pengetahuan dengan strategi bisnis perusahaan)																		*Adaptability*
																			Use
	Adaptability (Pengetahuan menyesuaikan keadaan)																		*Use*

Thematic Axes	Criteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Criteria
Difficulty to capture knowledge	*Identification of knowledge sources* (sumber pengetahuan)																		*Tacit knowledge*
																			Importance of tangible knowledge source
																			Rapidity of obsolence (Pengetahuan menjadi kadaluwarsa)
	Tacit knowledge (Pengetahuan yang belum terdokumentasi)																		*Importance of tangible knowledge source*
																			Rapidity of obsolence
	Importance of tangible knowledge source (Mendokumentasikan pengetahuan)																		*Rapidity of obsolence*

Thematic Axes	Criteria	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Criteria
Nature of Knowledge (sifat pengetahuan)	*Complexity* (Kerumitan)																		*Importance of past experiences*
																			Environment dependency
	Importance of past experiences (Pengaruh terhadap pengetahuan lampau)																		*Environment dependency* (ketergantungan terhadap kondisi lingkungan pabrik)

ENCLOSURE 2

Enclosure 2 AHP Result of Expert Parameter Wighting

ENCLOSURE 3

Enclosure 3 Questionnaire of Individual Assessment

NAMA RESPONDEN   :
JABATAN   :
UNIT KERJA   :
USIA   :
TAHUN MASUK KERJA :
PENGALAMAN KERJA (Sebelum menjadi karyawan PT. Petrokimia Gresik):

Perkenalkan nama saya Aldilah Rifna Ghaisani, mahasiswi semester 8 Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember (ITS) Surabaya. Saat ini saya sedang dalam tahap penyelesaian Tugas Akhir dengan judul *"Identifying Critical Knowledge for KM Implementation Readiness in PT. Petrokimia Gresik"*. Dalam Tugas Akhir ini, saya berfokus kepada kegiatan *Knowledge Management* yang sedang berkembang di PT. Petrokimia Gresik. Penelitian ini bertujuan untuk membantu pihak objek amatan dalam menentukan *knowledge* kritis khususnya di departemen-departemen yang memiliki banyak sekali informasi atau pengetahuan seperti Departemen Produksi.

Salah satu tahapan dalam penelitian ini ialah mengumpulkan data *knowledge* yang dimiliki perusahaan. Sebelum mengumpulkan data *knowledge* yang dimiliki perusahaan, langkah yang harus saya tempuh yakni menentukan para pakar atau ahli dalam tiap-tiap unit. Melalui kuisioner ini diharap nantinya akan dapat diidentifikasi siapa sajakah pakar dalam suatu unit tertentu. Penentuan tersebut akan disesuaikan dengan kriteria yang ditentukan dan nantinya akan dibobotkan sesuai dengan kondisi yang ada. Metode pembobotan yang digunakan yakni metode *Analytical Hierarchy Process* (AHP). Metode AHP dapat membandingkan kriteria baik secara individu ataupun berpasangan.

Berikut saya lampirkan beberapa pertanyaan yang menjadi dasar input dalam Tugas Akhir saya. Saya mengharap kesediaan Bapak untuk menjadi narasumber saya terhadap tiap-tiap bulir lampiran pertanyaan yang saya berikan dengan jawaban yang sejujur-jujurnya. Terima kasih atas ketersediaan dan kerjasama yang telah Bapak berikan.

Kuisioner ini diisi dengan menggunakan skala *Likert* yang bernilai 1-4. Tiap-tiap skala memiliki definisi penilaian yang berbeda. Contoh:

Type of assessment	Performance	Code	Performance factor	Rating	Explanation	Performance rating
Quantitative	Profile	1	Apakah pendidikan terakhir anda?	1	SMP	3
				2	SMA	
				3	S1	
				4	>S2	

Berarti pendidikan terakhir yang ditempuh adalah S1

QUESTIONNAIRE

Type of assessment	Aspect	Code	Expertise Criterion	Rating	Explanation	Criterion rating
Quantitative	Profile	1	Apakah pendidikan terakhir anda?	1	SMP	
				2	SMA	
				3	S1	
				4	>S2	
		2	Apakah anda kembali menempuh pendidikan setelah menjadi karyawan PT. Petrokimia Gresik? (Ya / Tidak) *Coret salah satu	1	SMA	*Jika ya, pilih salah satu.
				2	S1	
				3	S2	
				4	S3	
		3	Apakah anda pernah mendapat sertifikasi selama menjadi karyawan PT. Petrokimia Gresik? (Ya / Tidak) *Coret salah satu	1	Belum pernah	*Jika ya, pilih salah satu.
				2	1-3 kali selama bekerja	
				3	4-7 kali selama bekerja	
				4	8-12 kali selama bekerja	
		4	Apakah anda pernah memperoleh penghargaan atau menjuarai kompetisi selama menjadi karyawan PT. Petrokimia Gresik? (Ya / Tidak) *Coret salah satu	1	Belum pernah	*Jika ya, pilih salah satu.
				2	1-3 kali selama bekerja	
				3	4-7 kali selama bekerja	
				4	>7 kali selama bekerja	

Type of assessment	Aspect	Code	Expertise Criterion	Rating	Explanation	Criterion rating
Quantitative	Work Execution	1	Apakah anda pernah menjadi pembimbing karyawan dengan jabatan di bawah anda?	1	Belum pernah	
				2	1-2 kali selama bekerja	
				3	3-4 kali selama bekerja	
				4	>5 kali selama bekerja	
		2	Apakah anda pernah menjadi narasumber dalam pertemuan khusus (seperti: rapat dengan direksi)?	1	Belum pernah	
				2	Kadang-kadang	
				3	Sering	
				4	Selalu	
	Research	1	Apakah anda pernah menjadi pembimbing kerja praktik / tugas akhir mahasiswa penelitian di PT. Petrokimia Gresik?	1	Belum pernah	
				2	1-2 kali selama bekerja	
				3	3-4 kali selama bekerja	
				4	>5 kali selama bekerja	
		2	Apakah anda pernah mengikuti kegiatan inovasi (minimal kegiatan Sistem Saran)?	1	Belum pernah	
				2	1-2 kali selama bekerja	
				3	3-4 kali selama bekerja	
				4	>5 kali selama bekerja	
		3	Apakah anda pernah membuat instruksi kerja?	1	Belum pernah	
				2	1-2 kali selama bekerja	
				3	3-4 kali selama bekerja	
				4	>5 kali selama bekerja	

Type of assessment	Aspect	Code	Expertise Criterion	Rating	Explanation	Criterion rating
Qualitative	Performance	1	Bagaimana keterlibatan anda dalam kegiatan dan program kerja PT. Petrokimia Gresik	1	Tidak pernah terlibat	
				2	Jarang terlibat	
				3	Sering terlibat	
				4	Selalu terlibat	
		2	Bagaimana kemampuan problem solving dan inovasi yang anda miliki dalam menghadapi permasalahan yang kerap terjadi di PT. Petrokimia Gresik khususnya bagian CandalProd 2A?	1	Kemampuan *problem solving* dan inovasi minim	
				2	Kemampuan *problem solving* dan inovasi cukup	
				3	Kemampuan *problem solving* dan inovasi baik	
				4	Kemampuan *problem solving* dan inovasi mumpuni dan mampu berbagi ke pihak lain	
		3	Bagaimana pengalaman yang anda dapatkan dalam menyelesaikan permasalahan yang kerap terjadi di PT. Petrokimia Gresik khususnya bagian CandalProd 2A?	1	Pengalaman yang dimiliki minim	
				2	Pengalaman yang dimiliki cukup	
				3	Pengalaman yang dimiliki banyak	
				4	Pengalaman yang dimiliki mumpuni dan mampu berbagi ke pihak lain	

Catatan khusus
- Ceritakan tentang keterlibatan anda dalam kegiatan dan program kerja PT. Petrokimia Gresik

_____
_____
_____
_____
_____
_____

- Ceritakan inovasi apa yang pernah anda lakukan selama menjadi karyawan PT. Petrokimia Gresik

_____
_____
_____
_____
_____
_____

119

ENCLOSURE 4

Enclosure 4 Questionnaire of Critical Knowledge Criterion Assessment

NAMA RESPONDEN :
JABATAN :
UNIT KERJA :

Perkenalkan nama saya, Adeilah Rifza Ghaisani, mahasiswi semester 8 jurusan Teknik Industri Institut Teknologi Sepuluh Nopember (ITS) Surabaya. Saat ini saya sedang dalam tahap penyelesaian Tugas Akhir dengan judul "Identifying Critical Knowledge for KM Implementation Readiness in PT. Petrokimia Gresik". Dalam Tugas Akhir ini saya berfokus kepada kegiatan Knowledge Management yang sedang berkembang di PT. Petrokimia Gresik. Penelitian ini bertujuan untuk membantu pihak objek amatan dalam menentukan knowledge kritis khususnya di departemen-departemen yang memiliki banyak sekali informasi atau pengetahuan.

Salah satu tahapan dalam penelitian ini ialah melakukan penilaian terhadap kategori-kategori pengetahuan kritis. Tujuannya adalah mendapatkan kategori yang sesuai dengan keadaan perusahaan.

Berikut saya lampirkan form penilaian kategorinya. Saya menghrap kesediaan Bapak untuk menjadi narasumber saya terhadap tiap-tiap butir lampiran kategori yang saya berikan dengan memberikan penilaian sesuai dengan kondisi perusahaan. Terima kasih atas kesediaan dan kerjasama yang telah Bapak berikan.

Kuisioner ini diisi dengan menggunakan skala 1-4 dengan penjelasan seperti berikut ini.

ASSESSMENT	
Tidak penting untuk diidentifikasi	1
Bisa dimasukkan sbg kriteria bisa tidak	2
Sangat membantu jika dimasukkan dalam kriteria	3
Wajib dimasukkan sebagai kriteria	4

Berikan penilaian anda terhadap masing-masing kriteria untuk penentuan pengetahuan kritis berikut ini.

No.	Thematic Axes	Code	Criteria	Assessment			
				1	2	3	4
1	Rarity (aneh, jarang)	1a	Number and availability of experts				
		1b	Externalization				
		1c	Leadership				
		1d	Originality				
		1e	Confidentiality				
2	Utility	2a	Corresponding to strategic objectives				
		2b	Value creation				
		2c	Emergence				
		2d	Adaptability				
		2e	Use				
3	Difficulty to capture knowledge	3a	Identification of knowledge sources				
		3b	Mobilization of networks				
		3c	Tacit knowledge				
		3d	Importance of tangible knowledge source				
		3e	Rapidity of obsolence				
4	Nature of Knowledge (sifat pengetahuan)	4a	Depth				
		4b	Complexity				
		4c	Difficulty of appropriation				
		4d	Importance of past experiences				
		4e	Environment dependency				

ENCLOSURE 5

Enclosure 5 Result of SPSS

```
  /VARIABLES=VAR00001 VAR00002 VAR00003 VAR00004 VAR00005 VAR00006 VAR000
07 VAR00008 VAR00009 VAR00010
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE CORR

  /SUMMARY=TOTAL.
```

Notes

Output Created		22-Jun-2015 10:12:55
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	30
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY
		/VARIABLES=VAR00001 VAR00002 VAR00003 VAR00004 VAR00005 VAR00006 VAR00007 VAR00008 VAR00009 VAR00010
		/SCALE('ALL VARIABLES') ALL
		/MODEL=ALPHA
		/STATISTICS=DESCRIPTIVE SCALE CORR
		/SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.031
	Elapsed Time	00:00:00.008

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excludeda	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.658	.664	10

Item Statistics

	Mean	Std. Deviation	N
VAR00001	3.3333	.60648	30
VAR00002	1.7000	.53498	30
VAR00003	3.3333	.88409	30
VAR00004	2.0333	1.03335	30
VAR00005	1.9667	.96431	30
VAR00006	1.8667	.89955	30
VAR00007	1.8333	.83391	30
VAR00008	1.8667	.93710	30
VAR00009	2.1333	1.04166	30
VAR00010	1.7000	.53498	30

Inter-Item Correlation Matrix

	VAR00001	VAR00002	VAR00003	VAR00004	VAR00005	VAR00006	VAR00007	VAR00008	VAR00009	VAR00010
VAR00001	1.000	-.106	-.086	-.073	.079	.211	.182	.081	.255	-.213
VAR00002	-.106	1.000	.219	.206	.180	.057	.039	.055	-.050	.880
VAR00003	-.086	.219	1.000	.252	.175	.145	.218	-.028	.100	.437
VAR00004	-.073	.206	.252	1.000	.416	.228	.287	.290	.156	.268
VAR00005	.079	.180	.175	.416	1.000	.193	.293	.109	.073	.247
VAR00006	.211	.057	.145	.228	.193	1.000	.935	-.022	.093	.057
VAR00007	.182	.039	.218	.287	.293	.935	1.000	.059	.066	.039
VAR00008	.081	.055	-.028	.290	.109	-.022	.059	1.000	.231	.055
VAR00009	.255	-.050	.100	.156	.073	.093	.066	.231	1.000	.136
VAR00010	-.213	.880	.437	.268	.247	.057	.039	.055	.136	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
VAR00001	18.4333	16.737	.107	.301	.667
VAR00002	20.0667	16.202	.266	.860	.646
VAR00003	18.4333	14.875	.290	.432	.641
VAR00004	19.7333	13.030	.474	.324	.597
VAR00005	19.8000	13.890	.391	.315	.618
VAR00006	19.9000	13.955	.427	.901	.611
VAR00007	19.9333	13.789	.509	.907	.595
VAR00008	19.9000	15.334	.194	.196	.662
VAR00009	19.6333	14.723	.228	.339	.659
VAR00010	20.0667	15.720	.384	.893	.631

Scale Statistics

Mean	Variance	Std. Deviation	N of Items

125

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
21.7667	17.633	4.19921	10

This page is intentionally left blank

BIOGRAPHY

Aldilah Rifna Ghaisani was born on October 22, to parents Arif and Ratna. She has been finished her study in SDN Randuagung II (2000-2006), SMP Negeri 1 Gresik (2006-2009) and SMA Negeri 1 Gresik (2009-2011). In the middle of 2011, the author was accepted in ITS to continue her study at Industrial Engineering major.

During her study, the author was active in BEM FTI ITS for her 2nd and 3rd year of college life. She gave an influence in Human Resources Development Department in order to bring her life more useful. She was also become an active member of Djarum Foundation and got some excellent experience during every activity she was joined. Further information, contact at aldilahghaisani@yahoo.com.