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THE DEVELOPMENT OF THE KNOWLEDGE MANAGEMENT SYSTEM TO IMPROVE EMPLOYEES'S CAPABILITIES AND PERFORMANCES: A CASE STUDY AT JUPITER DEPARTMENT PT. XYZ COAL

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Abstract
Turnover and rotation engineer in technical section happens regularly. These are caused by engineer rotation to other departments, job promotion and employ resignation. Besides that, some issues such us; lack of engineer rotation in technical section itself, lack of transfer knowledge and communicate between individuals, and managerial competency gap. In the other hand, production section has problem with its supervisor. The problem comes from the diversity of competence and knowledge of each supervisor, slowly process of adaptation in new position, and competency gap in business ethic and organization commitment. From some impact of the problems that exist, knowledge must be seen as a strategic business asset. So some of things that the aim of this study are; (i) mapping the knowledge to get the overview of knowledge that has been utilize by the organization (ii) analyze the criticity of each knowledge in support in improving capabilities and employees performance. The research methodology are using knowledge mapping and gap analysis. At the end after developing knowledge management system in Jupiter department, all employees can learn from somebody else's mistakes and take advantages of each other's attainments. New and existing employees acquire job knowledge faster, reducing training time and providing higher job quality. Corporate knowledge management systems allow employees and departments work more efficiently, avoiding re-inventing the wheel, and reducing redundant work.

Keywords :
Knowledge, Knowledge Management, Knowledge Management System, Knowledge Mapping & Gap Analysis.

1. INTRODUCTION

PT. XYZ Coal operates in Borneo, Indonesia. Utilize an area more than 90,000 ha, produces three quality coal types with a total resource more than 4.5 billion tons, which is marketed in the foreign and domestic markets. In general, the company's mining operation is divided into 3 stages, namely: mining preparation, mining, and post mining.

The decreasing price of coal in 2018 was still affecting the entire coal mining industry, including KPC. Our biggest challenge throughout this year was on how to maintain business profitability amidst the decreasing coal price and the increasing operational cost components, namely tools maintenance, fuel, and workforce. Both efficiency and internal process optimization became KPC's main survival strategies to maintain our sustainability throughout these challenging times. Efficiency serves not only as a strategy in facing market challenges but it becomes a part of our Good Mining Practice, which has been implemented consistently in KPC. Efficiency is implemented within viable management of production and operational costs and our commitment to the environment and local communities. We believe that efficiency; process optimization and internal capability improvement are three KPC's key ingredients in achieving healthy and solid business productivity and financial performance in order to build a strong foundation towards sustainability.

Time will change continually with the rapid development of science and technology. Humans are now in globalization period. Globalization is a time when there are no more barriers in communication, information and also limits of the state. Certainly globalization is not without consequence. Some important issues regarding competition in all areas involving individuals, groups, organizations, companies, and even countries are subject to competition in getting their stated objectives.

Mining sector is one of the objects in globalization era. In this sector companies are required to compete for business purposes, profits and sustainable business growth. One of success keys for the company to remain competitive in the mining industry is continuous improvement and innovation to gain competitive position. Improvement and innovation is born from all abilities and potential mobilization of the company. Knowledge management is believed be one of the companies ways to improve competitiveness by utilizing a variety of enterprise resources, including knowledge explicit or implicit (hidden). Knowledge sharing is one of the company's efforts to develop human resources and knowledge sharing among employees in order to improve their innovate ability.

Jupiter as one of departments in Mining Operations Division (MOD) is committed to meet the production plan of overburden and coal expose production. Jupiter department has a pit called Pit Pinang South. Currently the employees in the Jupiter department are around 220 employees in several parts including production, services, and technical. Jupiter is leading by a manager who oversees three superintendents.

Pinang South pit Jupiter department is one of the best mines in the PT. XYZ Coal. In order to strengthen its competitive position, Jupiter continues to develop continuous improvement and innovation, which is one of the strategy implementation. Build a knowledge management system based on commitment to developing and dissemination of knowledge. Through knowledge management is also expected to knowledge sharing so as to create a powerful synergy and can develop competence and productivity of employees.

2. RESEARCH ISSUES

Turnover and rotation engineer in technical section is something that often happens. Substitution can be caused due to rotation to other departments, promotion and resigned from the company. From the results of interviews conducted to several engineers, complain that they are subjected to confusion / difficulty while in the new position when rotation. From the interview results also showed that in its own engineering teams no discussion forums. Remarks from the interviews with technical superintendent some problems that can be underlined is; (i) lack of engineer rotation system, (ii) lack of knowledge transfer, (iii) inter-personal communication is not going well. So it is needed a system that could accommodate the existing best practices that do not disappear when there is rotation in technical.

Another problem of competency measurement performed at the end of 2018 to determine a development program in 2019, found the competency gap in some sub-areas. If percentage data of total respondents (n = 9) then; report writing and presentation, continuous improvement, developing companies, business and communication acumen has a gap of 13%. Of all the technical

competency gaps in Jupiter appeared that gap they currently exist on managerial competence. For technical competence in Jupiter engineers already have their technical provisions in each of their college. So it does not happen for technical competence gap. From this it can be seen that for the level engineer at Jupiter department needs to be improved at the level of their managerial competence.

In the technical section, senior engineer for measuring competence, competency gaps that exist lies in the competence of the client focus (managerial competencies) and business ethics and organization commitment (core competencies) respectively by 13%. Client focus becomes important here as a senior engineer in charge of the engineer in the department should be able to direct their engineer on what they want the client Jupiter department.

Rotation in the production section is very necessary. From the results of survey conducted in the production section, stating that they require rotation. Rotation provides jobs benefits for employees. When compared to the technical section, the population number of production supervisors more than the population of engineers in the technical section (the current ratio between production supervisors with engineer 3:1). So that the rotation should be done in the production section can be more. From the results of interviews with production superintendent (immediate supervisor for 3 shift superintendent) associated rotation in the production section, there are two challenges/ problems facing production section that is; (i) the heterogeneity of competence and knowledge of each supervisor, (ii) the process of adaptation in the new position slowly.

Competency measurement conducted in the end of 2018 to determine the development program in 2019, it was found that the gap away on business ethics sub competence and commitment to the organization and sub-competencies of business insight. This is contrary to what was supposed to be owned by a production supervisor. Supervisor is the leader / supervisor immediately heavy equipment operators in mining field, if they do not have the competence “commitment to the organization & business insight” and “business ethics” even then it is doubtful how they conduct oversight of the operators in the field. This gap occurs in many production supervisors Jupiter department. The emergence of this gap dominantly is due to the owned background of mining supervisor. From the survey result a mining supervisor has an educational background that is not too high. Most of them are high school graduates or equivalent. They are workers who have long been in the field since they started became operator. Because good skills and a good attitude in the workplace, they are promoted to supervisor role. The level of intelligence and the power of their analysis is not too good, it is evidenced by an IQ test conditions were quite simply average - just average (resource from HR). However, their expertise and experience needed to do the job field.

From all of the issues that exist both in technical section and in production section. Obtained a set of consequences that arise from the problems that exist, namely;

a) Confusion appears to work in technical and production when they are rotation to a new position.
b) The lack of clarity on the rotation schedule, even rotation in the production sections less when compared with the technical.
c) The process of adaptation in the new position occurs quite long due to the confusion and lack of clarity in the program and system.
d) Lack of training programs needed supervisor and engineer related competency gaps that exist in them.
e) Lack of improvement transparency improvement programs.
f) The deviation of the closeness of supervision and engineers of the company (no sense to have companies).
g) Pessimism to face ahead mining challenges.
h) Missing knowledge.

3. METHODOLOGY

It is essential that the design and implementation of research methodology according to the focus and nature of the study problem (Yin, 1994, Wing et al., 1998). This study uses the methodology of the research approach that can answer the research question at the beginning of the writing of this thesis. The research methodologies used are using knowledge mapping and gap analysis.

In PT. XYZ coal knowledge management system has not been detailed look at the needs

of each department in the Mining Operation Division. PT. XYZ Coal still need to do a mapping of the problems that exist in each department, it is submitted by one of superintendent in department of learning & development (Bangun Nuswanto) in an interview with author. In an interview Learning & Development is also hope that this research will be able to improve the performance of each employee. Certainly this research will be helpful PT. XYZ Coal to develop their Knowledge Management System in every department.

Based on the exploration of business issue, from some impact of the problems that exist in the Jupiter department, knowledge must be seen as a strategic business asset. Required knowledge management efforts in order to encourage the development of the organization, this includes:

a) Ensure that employees have knowledge stored in the organization
b) Using KM to meet organizational goals
c) Using KM for efficiency in the process of mining operations

Framework is the comprehensive description of how we approach the problems and how we solve this problem, as positivism we believe the problem is happened and the secondary data has shown however this thesis more likely to stand as the interpretivism to seek the underlying facts that causes the issues (see figure 2.1). In this figure was also including the methods that we use in relation to understand each step in solving the problems. This figure also gives us the explanation of appropriateness in choosing such methods in apprehending the framework (validity).

The author proposed Jupiter department to make Process-Based Knowledge Map. The author choose Process-Based Knowledge Map because its main advantages are help identify the knowledge that critical for PT. XYZ Coal business process and provides pointers to locate the critical knowledge. These advantages will help Jupiter Department employee to improve their Knowledge Management System (KMS).

The Process-Based Knowledge Map for Jupiter is developed based on R.I. Ricciardi and Antonio Barroso's knowledge map methodology for Knowledge Map project in Instituto de Pesquisas Energeticase Nucleares (2004) that consists of five steps (see Figure 1)

The first step in knowledge mapping is processes study. This step consists of two sub steps, such as determination of focus area and explanation of the business process of the focused area.

Focus area in this step is production section and technical section. Both areas have been the focus because these areas have been research issue in this paper. After determining the focus area at this step, followed by a search for a business process in each section/focus area.

Once the main processes were understood, a discussion with the experts of the processes conducted. This step helped to classify every activity more precisely, and describes which knowledge is necessary and sufficient to perform the business process. The discussion with the experts is directed to answer key questions, i.e.: where does the knowledge come from; who owns it; what knowledge, tools, and templates that exist; and what barriers or issues exist. The answer for those questions is represented in the form of Process-Based Knowledge Mapping Matrix, a matrix which contains list of business processes of an organization/department within the organization, what knowledge is needed to perform the business processes, who has the knowledge, who needs the knowledge, where is the location of the knowledge or the location of the people who owns it, is the knowledge tacit or explicit, is the knowledge performed routine or non-routine, and what issues exist in the business processes.

Knowledge domain cartography is the graphical representation of where the knowledge assets of an organization exist (Ricciardi and Barroso-2004). Knowledge domain cartography is attempted to represent the organizational knowledge in a way that produces both visually friendly and accurate representation. "Domain" refers to the classification of knowledge according to themes or functionality. The construction of the cartography starts with a central node that followed by out flowing axes which finally will point out the knowledge. In this research, the author using software XMind as mind mapping tool to represent knowledge domain cartography of Pit Operation and Technical business process.

The evaluation of knowledge "criticity" or "criticity" analysis is a method to determine which knowledge is critical for the business

process of an organization. This step aims to assess the relevance of eachs knowledge according to objectives and goals of the organization and its respective degree of vulnerability.

The "criticity" analysis result in Appendix D shows that in Pit Operation business process, there are 60% (58 out of 96) knowledge that are critical for the business process of Operation section. In Appendix D also shows that in pit Technical business process, there is 74% (50 out of 68) knowledge that are critical for the business process of Technical section. The "criticity" analysis result indicates that:

a) The knowledge of pit operation and pit technical business process are used in day to day activities of Jupiter department in vast amount.
b) The knowledge in pit operation and pit technical business process has important contribution towards the achievement of the company's strategic goals.
c) Knowledge between Pit Operation and Pit Technical need a well collaboration to support department goal and target.
d) Pit Operational knowledge's that 53% critical are still in the form of tacit knowledge. The tacit knowledge among them is people management, monitoring techniques, decision making and much more.
e) Pit Technical knowledge's that 48%critical are still in the form of tacit knowledge. The tacit knowledge among them are budgeting, planning develop analyze and select the option, drainage design and much more.
f) Pit operation business process that is seen that in the process equipment usage & availability all critical knowledge in the sub business process is still a tacit knowledge of them; man power management, equipment effectiveness, manage and monitor improvement project, unscheduled and scheduled maintenance monitoring, and feedback system. Surely it takes an initiative that is able to make it as explicit knowledge.

This knowledge gap analysis was performed to assess the knowledge and expertise of by companies today, as well as identifying areas that are considered strong or need to repair.

The procedures/steps used in this gap analysis are;

a) Develop a question list for the questionnaire.
   Question of questionnaire drawn up with reference from business process in each section and considering the critical points of existing knowledge. In making questions related to the mastery level of knowledge and interest level of knowledge the author considering some knowledge result in knowledge mapping that has been done and also do some interviews with engineers and supervisors. After that the author put them in a list of questions and ready for validation.
b) Expert Validation.
   Author validate the question to some expert in Jupiter Department, i.e.; Muhammad Baqir (General Supt. Production), Mastan Muhasang (Shift Supt. Production), Zulfikar R Sagala (Supt. Technical), and Dian Annisafitri (Senior Engineer). It is important to make the questions better and stronger.
c) Distributing questionnaires.
   Questionnaires distributed to production and technical sections. In production section questionnaires distributed to the supervision of crew A and B. whereas for technical crew questionnaire distributed to all engineers in Jupiter.
d) Analysis.
   This knowledge gap analysis was performed to assess the knowledge and expertise of by companies today, as well as identifying areas that are considered strong or need to repair. Analyses were performed with charge current levels and the level of need (Society for Marketing Professional services, 1999). Charging is done by giving value at current mastery level and the level of interest. The scale used is the ordinal scale 1-5. After questionnaires collected, the data is processed by calculating the average level interests and the average level of mastery of the knowledge needed by employees.

Knowledge assets owned by Jupiter divided into four categories: experiential knowledge, conceptual knowledge assets, systemic knowledge assets and routine knowledge assets. The employee agrees to knowledge assets owned by Jupiter with an average score of the average of 3.73.

The results processing data to the source of knowledge, Jupiter has an average score value of 3.80. This shows that the respondents agree with the way to get knowledge. Sources of

knowledge in Jupiter consist of three sources, namely employee competencies, internal structures and external structures.

By doing a knowledge gap assessment process it is known circumstances required knowledge and knowledge is now available. To get the value of the knowledge gaps needed two things, namely the level of interest and the level of knowledge mastery. The level of interest shows how important it is for a company's knowledge, while the level of mastery shows the extent to which employees are able to master the knowledge. After getting the value of the interest rate and the level of knowledge mastery, k-gap value can be determined premises calculate the difference between the interest rate levels of mastery. The smaller difference between the interest rate, the smaller level of mastery is also the knowledge gaps. Large difference indicates the company is not able to manage knowledge well.

There is a knowledge gap in Jupiter department, which is in pit operation and pit technical. Gaps indicated by the difference between the interest rate levels of mastery of knowledge with knowledge.

4. RESULT AND DISCUSSION

With an in-depth understanding of the problems, issues and needs within the organization, it is then possible to meaningfully determine appropriate strategies for addressing them. This will undoubtedly include a range of both strategic (long-term) and tactical (short-term) initiatives. Depending on the issues identified, we will build knowledge management strategy steps these include:

1) Enabling Infrastructure
   a) Improving the corporate intranet, implementing new learning approaches, including e-learning, building a technology platform, discussion databases - *Knowledge Portal Jupiter*
   b) Good relationship between employees – *Daily Meeting, Weekly Meeting, Monthly Meeting, Communication Session quarterly*
2) Knowledge Sharing
   a) Formalizing communities of practice – *Jupiter Forum*
   b) Implementing coaching and mentoring programs – *Performance Dialogue (Feedback and Coaching) Program*
   c) Improving document and records management, facilitating skills transfer from retiring staff, capturing staff knowledge in a documented form – *Knowledge Team*
   d) Improving policies and procedures – *Standard Operational Procedure of Knowledge management*
   e) Formalizing the role of '*knowledge brokers*' within the department
3) Knowledge Outfitting
   a) Meta-knowledge – *Training Class*
   b) Thought Leadership – *Knowledge Sponsor & Knowledge Champion*
   c) Video presentation of performing and describing the critical points of activities – *Best Practice Video*
4) Smart Workplace
   a) Integrated performance support – *Performance measure (Performance Management System & Balanced Scorecard)*
   b) Job tools are knowledge tools – *Periodic Rotation Program, comparative study*
   c) "Continuous Learning" – *Periodic Knowledge Workshop*

5. CONCLUSION

At the end after developing knowledge management system in Jupiter department, all employees can learn from somebody else's mistakes and take advantages of each other's attainments. New and existing employees acquire job knowledge faster, reducing training time and providing higher job quality. Corporate knowledge management systems allow employees and departments work more efficiently, avoiding re-inventing the wheel, and reducing redundant work.

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