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Chaos Management in Government and Mining Company Infrastructure Project in South Sulawesi

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Abstract:- Types of quantitative research, adapaun hasi research is as follows: pattern mining company PLC comprising a conceptual phase, planning, execution, and termination. R & d projects including the conceptual stage. The initial design, budget approval, to the granting of the contract is the planning phase. Stage management permission until commissioning is the stage of execution. Phase transition of the hand and the closing phase is termination. Early warning model shows that the project is on the edge of chaos when operational problems occur and the problem of the availability of a time. Early-warning signals can arise at the time when the project is experiencing any of the issues above. The situation is still under control of the project if the project only administrative problems, disasters, safety, and design. Innovative decision-making while at the edge of chaos is presented through positive coordination between stakeholders of the project. This positive coordination can occur if there is a contingency plan and communication plan of the project manager. The communication plan should be preceded by mapping the stakeholders. Contingency plans must be preceded by risk mapping and mitigasinya.

Keywords:- *Stake Holder, Mining, Management, Facility, Infrastructure.*

I. INTRODUCTION

➢ *Background*

As with any other multinational company, PT Indonesia allocates funds Vale is great for investment capital. Capital investment needed to keep the business keep growing and at the same time maintaining the continuity of production levels. Each year, depending on the investment strategy of the company, PT Indonesia Vale spends an average of one hundred million u.s. dollars to finance investment projects. This amount in a given year can be increased two to three times as much, especially if the company invests in large-scale project called Major Capital Project or Major Expansion Project.

Capital investment project value magnitudes beyond the Major Capital Project or Major Expansion Project shown in Figure 1. of the image, visible presence of fluctuations in the value of investment capital project in the last eight years. World nickel prices and factors in the global crisis had an influence on the amount of capital investment project. For example, the global economic crisis in which started in 2008-2010 effect on the declining value of investment in 2009 and 2010. The improvement of the condition of the global economy and the rise in the price of nickel in the world year 2011 significantly increasing the amount of capital investment project.

However, two factors are not the only reason has always been the ups and downs of investment value. The condition of equipment and production facilities as well as support facilities also give influence on the amount of investment capital project. This can be seen in the value of the investment in the year 2015 which remained in the range of one hundred ten million u.s. dollars even though the price of nickel has suffered a decline since the first quarter of the year 2015.

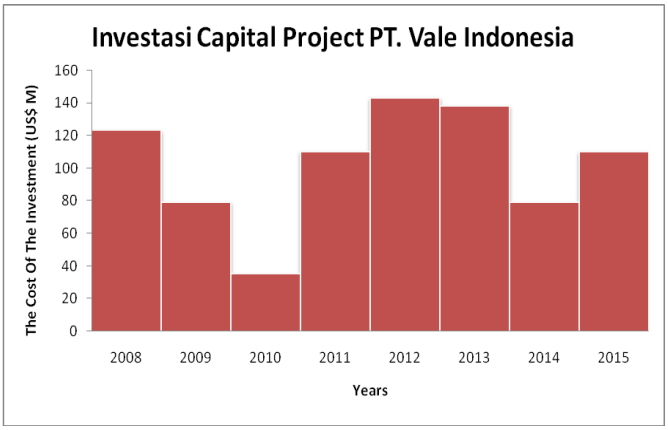

Fig 1:- Graphs of Investment Capital project 2008-2015 (source: Capex Report PT. Vale 2008-2015 Indonesia)

In recent years the implementation of a capital project at PT. Vale Indonesia faces challenges. The global economic slowdown, which was followed by a decline in the prices of some commodities in world trade, including nickel, became a major concern for the metals and minerals business, no exception PT. Indonesia, producing company Vale nickel's largest Indonesian. Based on the London Metal Exchange

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(LME) as shown in Figure 2, in the last five years, the price of nickel per ton during the period February 2015 to still be in the range of USD 15,000/metric tons, a sharp nosedive into the range of 8,500 USD/metric tons in period February 2016. This means that, in the past year alone has occurred a price reduction of approximately 43%. When compared to the price of nickel in the same period in February 2011, Yixin even much more after roughly seventy percent.

Fig 2:- World Nickel price drop Trend (USD/lb.) [124]

This condition not only promoted to the company's financial balance sheet instability in General, but also on investment projects that can not be removed and should still be run to maintain the sustainability of the company's operations. With such a price decline, the actors in the field of capital project required for more effective and efficient in carrying out investment projects became its responsibility amid challenges at hand.

The challenge in the form of external challenges i.e. the condition of the global economy experiencing a slowdown by continually declining metal commodity prices worldwide. Internal performance related challenges of implementing capital project in Indonesia that, PT. Vale also cannot be said to have been encouraging. Still often encountered, projects that pertained in capital projects are experiencing a shortage and excess budget (over budget or under budget), the schedule of the completion of the project is not in accordance with the plan, the end product that is not in accordance with the plan or even a project that enters the category of faded. Based on the financial performance and the achievement of schedule against 240 fruit capital project which has been declared completed in the period of the year 2006 – 2015, found that if the review of the financial performance as illustrated in Figure 3 here , as many as sixty percent of capital project spending less than 95% of the funds have been budgeted. 28% spend 95%-100% of the funds budgeted and twelve percent spend more than budgeted funds.

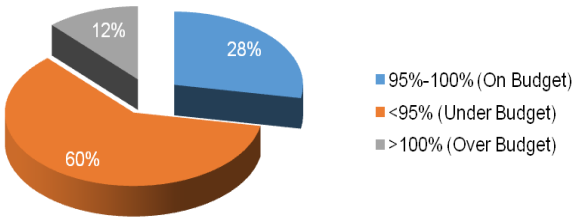

Fig 3:- Financial performance Capital Project 2006 – 2015 (Source: Capex Report PTVI 2006-2015)

The achievement of the project schedule, as shown in Figure 4 here, as many as 51% of projects categorized late from a predetermined schedule and only 49% faster or in accordance with a predetermined schedule. These results are certainly not encouraging because of the budget shortfall, the budget surplus and delay against a predetermined schedule means the ineffectiveness and inefficiency in the implementation of capital projects, which is usually not performance expected by the owners of capital, in this case the company's management and investors.

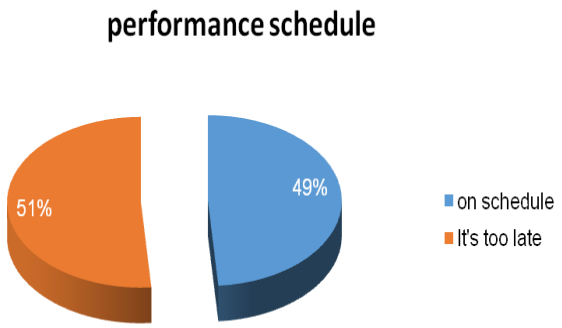

Fig 4:- The performance of Capital Project Schedule Achievements 2006 – 2015 (Source: Capex Report PTVI 2006-2015)

Inherently, all work involving the working group contains elements of chaos in it (Brechner, 2015:23). Chaos cannot be avoided because we could perfectly plan and manage projects with infinite precision. The source of chaos in the management of projects is the high uncertainty, reflecting the degree of risk of a project reaches a failure, especially on new projects (Straw, 2015:10). What can be done by the Manager is using a variety of techniques that minimize the chaos so that the project is capable of running as planned.

A variety of efforts undertaken to reduce the chaos (chaos) in the implementation of the project. The research emphasizes the importance of knowledge sharing between practitioners in community organization (Lee et al, 2015). However, this effort is hindered by the constraints of culture,

organizational-level constraints on programs, projects, and team constraints constraint of legislative-governance (Mollaoglu et al, 2015). To resolve this issue, the Organization's internal capabilities and resources should be maximized for the sake of the success of the project (Brentani and Kleinschmidt, 2015).

According to Chaos Theory, a little chaos is indeed desirable since it encourages innovation (Walker, 2015:53). This means that a project does not have to be absolutely according to plan, but not also should be left completely screwed up so that failed. In such a situation, the indispensable presence of understanding of the complexity of the project, with describe, characterize, and measure project complexity (Xia and Chan, 2012) as a potential source of chaos, then identify whether These sources of the society into chaos, or whether there are other sources of chaos in addition to complexity. More than that, it is necessary to grasp the effects of chaos against the performance of the project and what are the factors that allow chaos brought on the performance of the project.

➢ *Formulation of the Problem*

- There has been no pattern of PLC for the construction project of the infrastructure of Government and private mining in South Sulawesi.
- There is no early warning system to find out when the project was at the edge of chaos?
- Yet no resources, consideration, and the process used to produce groundbreaking decisions in situations of edge of chaos.

II. A REVIEW OF THE LITERATURE

A. Resource Based View

Resource Based View (RBV) is a major strategic management theory looks at that performance will be achieved based on the quality of the resources owned by the organization or project. Resources are "assets visible and invisible used the Organization to produce and implement his strategy" (Barney and Arikan, 2006). RBV theory argue that there are four characteristics of resources that are able to achieve high performance, abbreviated as VRIO, i.e. valuable (Valuable), rare (Rare), diimitasi hard (difficult to Imitate), and supported by organizations (supported by Organization) (Jugdev, 2004). VRIO quality resources capable of achieving high performance because it generates a competitive advantage compared to organizations with resources that do not have one of these superior quality resources. VRIO resources need to be managed through organizational capabilities before being able to achieve competitive advantage (Jugdev and Thomas, 2002). Together, the VRIO resources and capabilities into a core competency of the Organization of the competition.

The theory was developed by Barney (1991) and Peteraf (1993) and was originally intended to describe the relationship between the Organization in business competition, in particular in the framework of the industry (Barney, 2001). However, there is no constraint to apply them within the scope of the project. Bredillet (2007), for example, stated that through the project, resources and competencies were mobilized to achieve competitive advantage. In other words, the project is not another attempt at managing resources in such a way so as to produce performance.

B. project management

A project in its implementation will not be able to walk and successfully as expected if the project is not executed with proper management. Project management is a way of managing, directing and organizing the resources i.e. human and material from the beginning of the project until completion to achieve a specific goal, with limited by cost, time, and quality that have set (the NINE Guide 4th Edition, 2008:6). A project is composed of several elements such as objectives that are defined as outcomes, outputs or products, the complexity of the activities that are usually intertwined and a large number of different tasks, the uncertainty that contain elements of risk and so on. With these circumstances, required management process to ensure objective, complexities and risks can be managed properly. Munns and Bjeirmi (1996:81-87), defines project management as the process of controlling the attainment of project goals, using the existing organizational structure and resources by implementing a set of tools and techniques without disturbing the regular operation the company. Some of the functions of project management defines the requirements of work, allocating resource requirements, planning the implementation of the work required, monitoring the progress of the work and taking action to unexpected events that occurs (Bjeirmi, Munns and 1996:81-87). However, Clarke (1999:139-145) emphasized that the only project management tools to help the process of change and when used in a timely manner can lead to problem solving critical issues for an organization.

C. Risk Management

Risk management is the assessment and mitigation of potential issues that are becoming a threat to a business, from any source or origin (Stroie and Rusu, 2011:228). Potential issues that a threat is referred to as risk. Other notions of risk is the probability of the event or activity inhibit the achievement of strategic and operational objectives of the Organization (Deysher, 2015:13).

Risk assessment related issues, classified based on two dimensions, namely the severity and probability. Severity is the degree of the seriousness of the impact, while the probability is likely if the impact will emerge (Deysher, 2015:16). Each dimension can be quantified using five degrees from the lowest to the worst/most likely. The severity of the splayed ranging from negligible (1), (2) minor, (3), (4), and (5) destroy everything. Meanwhile, the level of probability include (1) nearly impossible, (2) further, the occasional (3), (4) is likely to occur, and (5) are frequent. High risk course

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has a high probability and severity, and vice versa. In diagramatis, this can be shown in Figure 5.

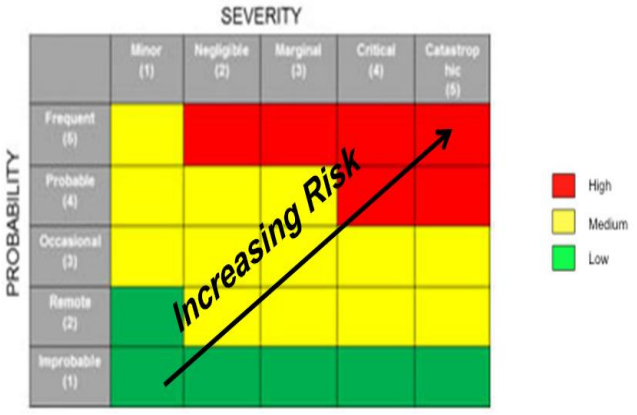

Fig 5:- Generic risk assessment (Deysher, 2015:17)

Something that low-risk would not necessarily be accepted fully. A critical or risk destroying everything, though hardly likely, should obtain a status of alert, termed ALARP (As Low As "Reasonably Practical"). Similarly, something that was risk are not necessarily enter the category of ALARP. If the risk occurs and occasional minor or negligible, and this risk is generally acceptable. Meanwhile, the risk that the impact is negligible but often the case must go in a situation that is not acceptable. Red (high) risk of others is not acceptable, except for the risk of a catastrophic collapse but occasionally occur, which enters the category of ALARP. Graphically, this categorization is shown as follows:

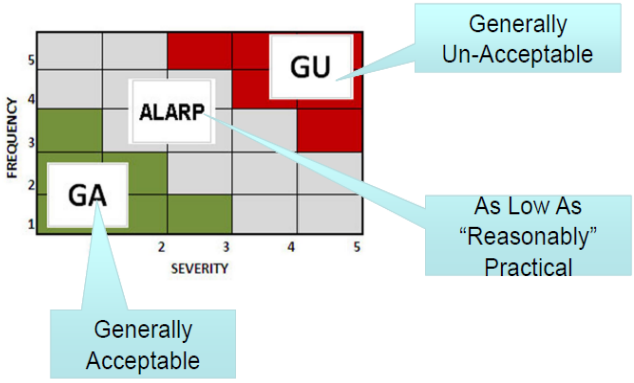

Fig 6:- Area of Risk that can be accepted (Deysher, 2015:18)

Related risk mitigation process, the efforts made will depend largely on the broader risk characteristics, in terms of not only with regard to frequency and severity, but also what the risk itself and the context of the risk can be terjadai. The point is to risk mitigation issues, the process occurs more freely and can vary between organizations or projects.

An organization or projects are required to conduct risk management. This is not only for the sake of guaranteeing success in running projects but also (1) building a culture of proactively fixes, (2) increasing the confidence and satisfaction of consumers, (3) improving the efficiency and operational governance proactively, (4) allow the Organization to apply the control management system to analyze risk and minimize losses, (5) allows organizations to respond to changes effectively and protect the business as it grew, (6) ensure consistency the quality of goods or services, (7) build a strong knowledge base, (8) build confidence stakeholders in the use of the techniques of risk, and (9) enhance performance and resiliensi management system (BSI, 2015:3).

D. Project Life Cycle

Each project through a project life cycle (PLC – Project Life Cycle). PLC is the number of organized activities that are required to develop a project of the proposition or insepsinya until full completion or implementation (Manzanera, 1991). Each stage in the PLC involves decision making as well as the commitment of those involved in the development project (Shia and Omar, 2014). In the PLC are a variety of activities such as project analysis, project plan, implementation of the project, project evaluation, and dissemination project (McCune, 2012).

The real pattern of PLC in the field can reflect the existence of problems that are caused by problems in the project (Larasati, 2011). The problem at one stage resulted in the change of the pattern of PLC planned. Problems in the prokuremen for example, can result in the occurrence of shifting the time of implementation of the project so that the project could not be completed on time. The more problems occur, the changing pattern between PLC planned with a real PLC in the field. GAO et al (1999) introduced the concept of survival rate dynamic (dynamic fitness) as an indicator of the ability of the pattern of PLC of a project in the face of the changing situation on the ground.

The existence of discrepancies between the planned with PLC PLC the real implies the existence of chaos in implementing the project. This is due to the onset of the project complexity (Banter and Melnic, 2012). The innovative nature of the project or run in an environment that is vulnerable is a project that most experienced chaos in the PLC because of the many risks that can not be predicted (Na et al, 2004). Innovative projects, such as the IT application development project, is a project with a high level of Chaos. The Study Group 2000-2006 years Standish found that success rates in application development projects IT only shifted from 26% in the year 1998 be 35% in 2006 while the rate of project challenged, in terms of successfully completed but it did not reach the goal of cost, time, and specifications, unchanged at a rate of 46% (John et al., 2010). Ten of the biggest barriers that make a project experience challenges include a lack of input from the user, the requirements and specifications are incomplete, requirements and specifications change, the lack of executive support, incompetence technology, lack of resources, expectations that are not realistic, the purpose of

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which is not clear, the time frame is not realistic, and the presence of new technology (Standish Group, 1995).

III. RESEARCH METHODS

This study was designed as a mixed research with methods of analysis documents, surveys, and interviews.

IV. RESEARCH RESULTS

The research is reported in the section beginning. These results explain the information obtained from the results of the survey on the workers as many as 155 people, the project analysis report documents of the project and related documents, as well as interviews of three people tutor. The first speaker was a coal conversion project manager CCP2 K2 was about 41-50 years 16-20 years of work experience. The second resource is the CTP project manager Balantang, aged about 45 with annual work experience 16-20 years. The third speaker was project manager development of Pier 40 old Mangkasa annual points with 11-15 years of working experience. The third speaker of the male sex.

A. The Survey Results

As shown in Table 1, the results of the survey showed that the most common problems in the project dealt with the respondent is a matter of different local conditions from which allegedly (an average of 3.63) followed by the issue of design changes project (an average of 3.58), and issue specifications that turned out not quite (average 3.49). In the meantime, the problem that most rare of agrarian conflict is a problem (average 1.77), the problem of fires (average 1.47), and natural disasters (average 1.36).

No	Problem	Mean	Std. Deviation
1	Local conditions different from those alleged	3,63	1,16
2	Changes in project design	3,58	1,11
3	The specification is not enough	3,49	1,34
4	Availability of labor	3,41	1,36
5	The availability of the equipment	3,40	1,34
6	Less resources	3,08	1,22
7	Bad weather	3,06	1,54
8	The quality does not match	2,91	1,23
9	Low productivity	2,89	1,31
10	The material is bad	2,86	1,20
11	The problem of work safety and health	2,83	1,49
12	Access location pending	2,74	1,18
13	Sluggish administration	2,44	1,55
14	A work rule change negotiations	2,35	1,28
15	Permits are hard to come by	2,34	1,41
16	Conflict and labor strikes	2,34	1,28
17	Funds are not available	2,16	1,44
18	The rules changed constructs	1,96	1,17
19	Changes in legislation	1,78	1,30
20	Agrarian conflicts	1,77	1,50
21	Fire	1,47	1,16
22	Natural disasters	1,36	1,03

Table 1. Frequency of Occurrence of Problems in Project

Source: data processed, 2018

Meanwhile, in particular, the problems encountered on the third project examined is shown in Table 2 below:

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No.	QUESTION	CCP2	CTP	MPJU
1	The project schedule is too tight		X	
2	The problem of project financing		X	X
3	Fickle client requests	X	X	
4	The design is often fickle			X
5	Insufficient project schedule		X	X
6	Location information (soil test reports and surveys) are not sufficient		X	X
7	The estimated cost of the incomplete or inaccurate			
8	Low contractor management capabilities	X	X	X
9	The contractor pays the wages of difficult		X	X
10	Low worker competence	X	X	
11	Not available enough managers and professionals		X	
12	There is no insurance for large equipment			
13	There is no safety for workers insurance			
14	Protective tools themselves is insufficient or there is malicious activities			X
15	No tools readily available on site	X		X
16	The amount of labor that is less berkecakapan is available	X	X	X
17	Lawsuits because of haphazard construction dump			
18	Serious air pollution because of construction activity			
19	Serious noise due to construction activity			
20	Water pollution due to construction activity			
21	Subcontractor management competence are low		X	X
22	The supplier is not competent to submit material on time		X	X
23	Government bureaucracy with rambling			X
24	Government approval procedures are too long		X	X
25	Construction material price inflation			X
	The total number of	5	13	14

Table 2. Comparison of case Problem Research

Description: CCP: Coal Conversion Project 2; CTP: Balatang Coal Transport Project; MPJU = Mangkasa Point Jetty Upgrade

From table 2 above, note that the project is a project relative CCP2 are simple compared to the CTP project and project MPJU. There are two common problems on the third

project that is the low contractors management capabilities and the amount of labor that is less berkecakapan is available.

Further, here is a review of the cases the project obtained from documents and interviews with the speakers.

➢ *Project Coal Conversion Project PT Vale*

Although it is a nickel mining company, PT requires the Vale coal to become the fuel burn on three furnaces dryer in nickel processing plant. Coal is used to replace the previous fuel in the form of high sulfur containing fuel oil (HSFO – High Sulphur Fuel Oil) (Vale, 2015). The conversion aims to squeeze production costs. In the first phase, before the year 2014, this conversion has been able to save production costs up to 100 thousand u.s. dollars per day due to lower usage of 144 thousand tonnes of HSFO into 44 thousand tons/year (Vale, 2015b). The project examined current is a project at the second phase.

The project started end of 2016. The main challenge in this project was the blackout period i.e. the period in which the machine must be turned off due to the replacement of the machine. During this period, a number of problems occurred. These issues are more technical in nature and only have an impact on the increase in work time. Due to these problems, the project team worked more than 14 hours a day.

Any potential delay occurs, the project team immediately took to the field to resolve the problem. The team looking for the root of the problem and then find a solution. The solution is a solution that is taken directly to the source of the problem. The team then appoints the members of the team must be completed and the deadline is the issue. The resulting solution is the standard solutions are wont to do because of the problems that arise in General is a problem due to the standardized methods that are not done properly.

An example of the problems faced is related the completion of the installation of parts of the instrument as it is not found with quick connectors. The connector is complete but because it is not given, then the marker of the first so that the connector needs time to look it up again. This problem is caused because connector is a small and specific items for specific parts. This places undue given bookmark and sorted so that it is easy to find and use.

Another issue is the occurrence of repeated jobs due to disharmony between shift and night shift. As a result, the work being done by the night shift must be disassembled and repaired on the next shift. Of course there is an agreed design and transferable from the morning shift to the night shift so that there is no need to restart work.

In addition, most of the equipment is the object of the previous project. Disharmony with other projects that led to the existence of a logic that is not modified so that the process of commissioning late. Of course there are discussions with other project teams in order to make the equipment become the object of two or more projects can be entered in the detail planning and correct and is not missed.

From the experience in this project, interviewees suggested that similar projects may be carried out elsewhere must have the scope in more detail as well as involving operation and maintenance from the beginning especially on the initial design and review the selection of the material. In addition, the next project should be doing simulated blackout to make proper estimated duration and foresee problems in the future. Each item is small and must be handled specifically critical and necessary testing and complete communication to facilitate commissioning. More than that, there should be a lesson learned documents so that similar problems do not happen again.

In General, the initial plan stages of this project include:

- Preliminary Data. This data is retrieved from previous projects (CCP1) so that it becomes available.
- Implementation of the FEL-3 (front-end Loading-3) to get the price of the construction, the estimated duration of the project, and the price of the material. FEL-3 is the stage before the execution in a typical project phases in the areas of upstream industries such as processing, petrochemical, pharmaceutical, and distillation. FEL, also known as Pre-Project Planning consists of three stages. FEL-1 generates an outer form of material balance, energy balance, and outline of the project. FEL-2 generates initial equipment design, floor plan early, the early schedule, and initial estimates. FEL-3 produces the main equipment specifications are ready to buy, be sure, estimation of project execution plans, three-dimensional model of the beginning, equipment list, and the list of paths.
- Manufacture of CAR to get the budget approved.
- After the budget is approved, do the work of keinsinyuran and the purchase of material burner.
- Once the material arrives, do not require construction blackout.
- After the blackout time arrived and the construction does not require the blackout has been completed, started the job burnout.
- After completion of job Burnout, burner tested cobakan and checked carefully. If the burner is lit, the kiln can be ignited again.
- Perform delicate settings to get optimal results.

Overall, the speaker mentioned a number of problems in the coal conversion project includes:

- Fickle client requests
- low contractor management capabilities
- low worker Competence
- No tools readily available on site
- The amount of labor that is less berkecakapan is available

5.3 Project CTP (Coal Transportation Project) Balantang

CTP is the coal transport facilities Balantang PT Vale Indonesia which was in the port of Balantang, Malili, Luwu Timur. CTP Balantang aims to accelerate and enlarge the volume of logistic loading and unloading sacks of coal and nickel PT Vale.

The CTP project Balantang years 2014 mencakuplah Assembly and installation of E-Crane is a giant coal to transport and logistics from the barge to the storage area (stockpile) in the port of Balantang to then transported to factories. With the CTP, coal transport volume Balantang increased from 250 thousand metric tons into 400 thousand metric tons. E-Crane able to transport as much as nine coal barges per month, sulfur three times per year each of 22 thousand tons per vehicle, and nickel to pre-load barges twice per month (Vale, 2015).

CTP Balantang is part of two projects CTP PT Vale. The other is the CTP in factory (plant site). CTP Balantang has investment value 17.5 million u.s. dollars. The coal storage area CTP Balantang-capacity 24 thousand tons, from earlier by 20 thousand tons (Vale, 2015).

Balantang CTP development project involving three Contracting companies: Truba, son of Karebbe (PKU), and Beca. Truba served finish the job structure, mechanical, electrical, and civil. PKU served in completing the construction of the facilities of the anticipation of the danger of fire. Design and preparation of its own task in the hands of Beca. Meanwhile, PT Vale yourself involved as the provider of prokuremen, suppliers of capital, construction management, and supplier of gravel and cement for civil work (Vale, 2015).

The main difficulty in the construction of the project is to coordinate the Balantang CTP construction work, project material reservations, as well as efforts to reduce the pollution of coal during excavations in some areas for the storage of material (Vale, 2015).

The CTP project Balantang started in 2014 but actually has started since 2006. The CTP project then stopped in the year 2008 and proceeded in 2012 after a few times of revisions (Vale, 2015). When the project started to appear in the form of constraint problems in mobilization tool stake and labor recruitment problems. As a result, the project manager recruitment and therefore extend the time, delaying the start of the job. The resource person also solves the problem of mobilization tool stake by doing approach to related parties to ensure the solution. The solution obtained is a solution based on the results of the discussion with stakeholders. Although the work schedule was pushed back, this will not have an impact on the cost of construction.

Overall, the speaker mentioned a number of problems in the CTP project Balantang includes:

- Project Schedule too tight
- the problem of project financing
- the client request changeable
- insufficient Project Schedule
- location information (soil test reports and surveys) are not sufficient
- low contractor management capabilities
- the contractor pays the wages of difficult
- low worker Competence
- professional and manager not available enough

✓ The amount of labor that is less berkecakapan is available Subcontractor Management Competencies k. low
✓ Suppliers are not competent to submit material on time
✓ Government approval procedures are too long

After two years, the project was finally completed. This project is broader than planned because there are additions to the Riverside stake jobs accompanied by the submission of a budget for the addition of.

➢ *Project Mangkasa Point Jetty 5000 Dwt Upgrading*

Mangkasa Point Jetty Upgrade project aims to expand the jetty (Pier perpendicular to the coast) from originally 2000 DWT (deadweight tonnage – tonnage) to 5000 DWT.

Increase (upgrade) mencakuplah the creation of parallel docks Beach (wharf), the place of the recliner (dolphin), ship collisions reducer (fender) and a liaison with the Mainland jetty (trestle desk) for 5000 DWT capacity, making the place ship recliner fastening system (mooring dolphin), and modifications over the 2000 ship recliner DWT. In addition, the mechanical work done anyway in the form of the creation of a new pipeline to supply high speed diesel fuel (HSD – High Speed Diesel) and the creation of a new pump house. Electrical work includes the creation of a new lightning protection system installation.

This project started in 2012 with an r & d project Mangkasa Point Jetty Upgrade. Detail Design process starting in 2014 after the budget was approved from the management PTVI. Construction took place in 2015 after the granting of contracts, licensing, and procurement of materials with related government agencies.

The main problems that plagued the project schedule is the existence of bebebapa management of permissions to new Governments that are identified after the project is executed. Licensing involves the Central Government and regions so as to postpone the execution schedule of up to seven months. Project team down directly, in cooperation with the project sponsor and an external team to speed up the processing of permits. Step taken is the socialization and the intense communication with related government agencies accelerated management of construction documents.

In line with this licensing requirement, issued a number of related management costs of supporting documents such as UKL/UPL were not identified at the outset of the project. Based on communication with all internal stakeholders in

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PTVI, solution taken is to use environmental consultant for management of this permission. As a result, the new activity appears in your project and schedule of these activities is a critical activity.

The delay of seven months is actually not entirely due to licensing issues. The delay also caused a problem a time-consuming procurement of materials for fabrication and delivery.

At the end of the project, there was a delay in the time of completion. Meanwhile, the budget rise 16%. The extra budget is sourced from some of the items that need to be ditambanhkan to ensure construction can run better.

In General, the problems that occur include:

- Maintaining permissions for IMB Mangkasa Point Jetty requiring data UKL/UPL and letter of permission from the Office of naval relations in the beginning of the project.
- The process of installation of the anchor for the process of piling requires additional resources jetty column of marine consultants and also the process of inspection for anchor installation process.
- local labor Issues when the construction will take place.
- The use of the services of contractors because cooperation with subcontractor problematic in payment.

Contractor usage related to this, there has been litigation in the form of a lawsuit that was brought to the Supreme Court. In the case of numbered verdict 352/PDT/2017/PT. This JAWA, PT Sinarsuci Anekacandra (PTSA) sued PT Budi Prima Bakti (BBP) and PT Indonesia Vale (PTVI) Agreement No. 4600012749 related development work Mangkasa Point Jetty 5000 DWT Upgrading. In this agreement, PT BBP pointed PTSA as sub contractor sub contracts with a value of Rp 19 billion for 14 months of work from October 1, 2013 – 30 November 2014.

On April 1, 2014, PT BBP and delivery schedule of the material convey PTVI and stake by PTSA to the location of the project. To that end, PTSA ask PT BBP prepare all documents in the form of licensing ships loading and unloading. But the document that there is incomplete so that the delay of two months over 9 may 2014 should be July 17, 2014. More than that, there was a change of the place of unloading materials and tools of the stake by reason of security. Due to these events, the company is the owner of a barge and a stake, the PT. Multi Major Foundation (MPU) claim demmurage (expired usage time crates within the port).

PTSA continued claims to the PT and BBP PTVI in order for the two companies to pay the claims of $1.75 billion. Until September 2014, licensing of Hubla Service has not been delivered to the PTSA while Dinas Hubla himself stated that permission has issued 15 September 2014. Even if the month direct permission is given, the PTSA is still not able to complete the project on time because the remaining span of only two months.

PTSA claimed no benefit expected that a minimum of 10% of the project value (USD 1.9 Billion out of a total of Rp 19 billion). PTSA demanding payment of claims demmurage, payment 10% profit, and immaterial compensation amounting to Rp 5 billion, plus interest of 2%.

PTVI himself stated could not be sued because the agreement that exists only between the PTSA and BBP and PTVI role merely as an employer. While BBP stated do not do tort claims problems because demmurage does not exist in the cooperation agreement as well as sub contractors is unclear. PT MPU himself stated that they never demanded damages incurred.

A related issue, the Supreme Court ruled that the Court on the lower level (PN Jakarta Selatan) who decide PTSA as the losing side has been right and PTSA cannot file charges to PT BBP and PTVI. Supreme Court judge lawsuit the wrong parties (error in persona) and blur (obscuur libel).

Overall, the speaker mentioned a number of problems in project MPJ upgrades include:

a. Project Schedule too tight
b. the problem of project financing
c. Design often fickle
d. insufficient Project Schedule
e. location information (soil test reports and surveys) are not sufficient
f. no tools readily available on site
g. the amount of labor that is less berkecakapan is available
h. subcontractors Management Competency is low
i. Suppliers not competent to submit material on time
j. Bureaucracy with rambling
k. Government approval procedures are too long
b. construction materials price inflation

If the licensing issues from the beginning has been planned, it will not add to the complexity of the arrangements. This problem occurs because the information early on when will run the project are still minimal. Good project team or external team of less familiar with the peaturan for this type of construction involving many government agencies. The team eventually learn that they need to ripen stakeholder mapping before the execution process and mitigation plans are required in the implementation of the project. The team recommends that the definition of the scope of the project to ripen before the design details and ensure stakeholder mapping to find out plan mitigation and alternative plans in case the issue later in the day.

V. DISCUSSION OF RESEARCH RESULTS

The discussion over the answers to the research reported in three parts. The first part covers the model pattern PLC construction project infrastructure Government and private mining in South Sulawesi. The second part includes a model of early warning when the project is on the edge of chaos. The

third section builds innovative decision-making model in situations of edge of chaos.

➢ *Pattern of Private Infrastructure Construction Project Plc*

Mining Pattern PLC from third construction project can be directly drawn from the results of the interview. The pattern of PLC on the project Balantang CTP consists of stages:

1. Initial design
2. Detailed Design
3. Tenders
4. Construction
5. Turn of the hand
6. Closing

Meanwhile, the pattern of PLC of Mangkasa Point Jetty projects include:

1. R & D project (2012)
2. Approval of the budget
3. Design details (2014)
4. Tender
5. The granting of contracts
6. Purchase materials project
7. Management of the permissions
8. Construction (2015)
9. Testing
10. Commissioning: ensure all systems and components of the project were in accordance with the wishes of the client.
11. Closing

The above pattern of PLC can be combined due to more or less the same. The combined phases include:

1. R & D project
2. Initial design
3. Approval of the budget
4. Design detail
5. Tenders
6. The granting of contracts
7. Purchase materials project
8. Management of permissions
9. Construction
10. Testing
11. Commissioning
12. The transition of the hand
13. Closing

Nevertheless, of the stages above, the stages of purchasing materials management and project permits running contrast. Of course, the stages of management of permissions was done before the stage of purchasing materials because if permission did not come out, there is a risk of purchasing material that is not functioning and therefore, incurring losses. In line with this, then the appropriate phases are:

1. R & D project
2. Initial design
3. Approval of the budget
4. Design detail
5. Tenders
6. The granting of contracts
7. Management of the permissions
8. project material Purchase
9. Construction
10. Testing
11. Commissioning
12. The transition of the hand
13. Closing

Referring to the four phases of the project according to Patanakul et al (2013), namely the stage of conceptual, planning, execution, and termination. Then the r & d projects including the conceptual stage. The initial design, budget approval, to the granting of the contract is the planning phase. Stage management permission until commissioning is the stage of execution. Phase transition of the hand and the closing phase is termination.

➢ *The Model of Early Warning When the Project is on the Edge of Chaos*

The results of the survey indicate a number of problems that arise in the implementation of the project. These problems are then grouped in fewer factors using factor analysis (EFA) konfirmatoris. EFA analysis of wear of main pemfaktoran run with promax rotation. Eigen value assessment and test scree indicate six factors. The following table shows the charge factor of each item is a problem.

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	Component					
	1	2	3	4	5	6
The specification is not enough	-,242	,070	,181	,782	,041	-,105
Local conditions different from those alleged	,058	-,067	-,045	,715	,186	,095
Changes in project design	,245	,105	-,176	,791	-,221	-,083
The material is bad	-,073	,392	-,041	,284	,032	,338
The availability of the equipment	-,061	,118	-,005	,072	,755	,061
Availability of labor	,107	-,037	,004	-,065	,877	,063
Access location pending	-,028	,380	,152	,143	,206	,171
Funds are not available	,386	,491	,052	,001	,097	-,463
Less resources	-,083	,770	-,009	,055	,188	-,089
The quality does not match	-,085	,842	,158	,017	-,082	-,084
Low productivity	,108	,709	-,308	,027	-,039	,244
The problem of work safety and health	,017	,426	,041	-,436	,021	,574
Conflict and labor strikes	,035	,373	,326	,088	-,276	,201
A work rule change negotiations	,029	-,081	,505	,162	-,112	,378
Bad weather	-,081	-,030	-,094	,091	,099	,772
Fire	,006	,011	,874	-,029	,064	-,087
Natural disasters	,034	-,022	,879	-,073	,011	-,080
The rules changed constructs	,548	-,050	,110	,088	,117	,341
Permits are hard to come by	,835	,021	-,032	,051	-,022	-,075
Agrarian conflicts	,783	-,036	,262	-,072	-,064	,025
Sluggish administration	,872	,040	-,212	-,023	-,056	-,017
Changes in legislation	,845	-,175	,097	,051	,150	-,040

Table 3. Efa Analysis Results

Source: data processed, 2018

The above results indicate there are still some factors that charge low (< 0.4). Charge indicator with low factor eliminated. Among these groups, there are still indicators that do not comply conceptually with the naming of components. For example, although negotiations have the charge factor 0.505 but unsuitable conceptually with two other members of the Group 3 so deleted. The end result is a table component as follows.

	Component					
	1	2	3	4	5	6
The specification is not enough				,782		
Local conditions different from those alleged				,715		
Changes in project design				,791		
The availability of the equipment					,755	
Availability of labor					,877	
Funds are not available		,491				
Less resources		,770				
The quality does not match		,842				

Low productivity		,709				
The problem of work safety and health						,574
Bad weather						,772
Fire			,874			
Natural disasters			,879			
The rules changed constructs	,548					
Permits are hard to come by	,835					
Agrarian conflicts	,783					
Sluggish administration	,872					
Changes in legislation	,845					

Table 4. Results of Efa End

Furthermore, based on the similarity between indicators, component 1 is called the problem of the Administration, a component of the operational problems, named 2 component 3 is called the problem of disasters, component 4 is called the problem of design, component 5 is called the problem of availability, and 6 component called safety concerns. The members from each dimension are:

1. The issue of Administration: rules of construction permit to change, hard to come by, the agrarian conflict, the Administration is slow, the changes to the Act.

2. operational Issues: funding is not available, less resources, quality does not match, and low productivity.

3. The problem of disasters: fire, natural disasters.

4. Problem: design specification is not enough, local conditions different from those suspected, change the design of the project.

5. The issue of availability: the availability of equipment, the availability of manpower.

6. Safety issues: issues of safety and occupational health, bad weather.

Furthermore, the CFA is done to evaluate this factor further sixth. A number of the index matches the model used, the cover ratio of quadratic degrees of freedom against kai, comparative suitability index (CFI), and the square root of the average error approximation (RMSEA) (Kline, 2004). Based on the suitability of recommendations (Byrne, 1998), a six-factor model of CFA projects have a good match with the data: kai squares per degree of freedom (305,58/120) = 2.54, less than 3; CFI = 0.88, up 0.80; and RMSEA = 0.09, less than 0.10. Therefore, the results of the EFA and CFA shows if there are six types of problems that have emerged in the implementation of project risk.

A structural model to be tested to check the connection between the issue of the project with the performance of the project. Model (Figure 6.) indicates sufficient data match: kai squares per degree of freedom (385,61/168) = 2.30, less than 3; CFI = 0.85, 0.80 over; and RMSEA = 0.08, less than 0.10. As shown in Figure 5.2, R2 for variables bound of 0.42, indicating if a large percentage of variable explained by the factor. In the model, there are only two significant relationships. Significant relationships exist at operational issues on performance and availability on performance issues.

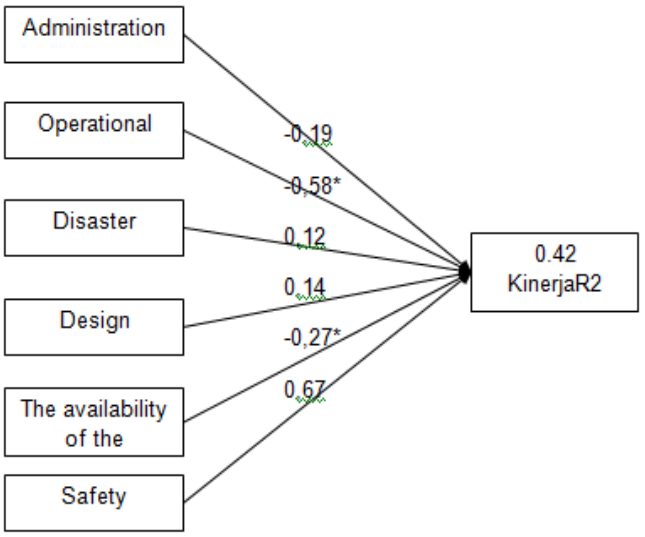

Fig 7:- A Model of the Influence of the Project Against Project Performance Problems

Description: * p < 0.10

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Variables that influence significantly on the performance of the above project into early warning signals of variable because of its appearance reflects the start to the high risk of failure faced by the project. A growing pile of these variables indicate that the project is approaching the edge of chaos situation and mitigation measures should be immediately taken.

These variables include the operational variables consisting of funds is not available, less resources, quality does not match, and low productivity; and availability of variables that include the availability of equipment and labor availability. When a POPs issue such as the problem of unavailability of funds, managers must take immediate action. The next problem that arises in the form of less resources, will further improve the risk towards the point of edge of chaos.

In the case of CTP Balantang, variable availability problems accumulate. Issues mobilization tool stake is not another aspect of availability of equipment while the labor recruitment problems is the issue of the availability of labour. Other signals that have emerged among others the problem of project financing (funds not available) and low worker competence, carry on low productivity.

In the case of Mangkasa Point Jetty, the main problem is a permissions problem. Although licensing is not a critical point, but the problem it brings on operational problems because there are no tools that are readily available on site. This is confirmed by SEM analysis. The following table shows the results of correlation between risk variables.

			Estimate	S.E.	C.R.	P
Ketersediaan	<-->	Keselamatan	0,36	,123	2,962	,003
Desain	<-->	Keselamatan	0,28	,084	3,316	***
Bencana	<-->	Keselamatan	0,20	,093	2,140	,032
Operasional	<-->	Keselamatan	0,49	,120	4,071	***
Administrasi	<-->	Keselamatan	-0,06	,119	-,531	,595
Desain	<-->	Ketersediaan	0,21	,069	3,095	,002
Bencana	<-->	Ketersediaan	0,12	,067	1,764	,078
Operasional	<-->	Ketersediaan	0,32	,095	3,310	***
Administrasi	<-->	Ketersediaan	0,08	,086	,874	,382
Bencana	<-->	Desain	0,12	,048	2,383	,017
Operasional	<-->	Desain	0,29	,072	4,084	***
Administrasi	<-->	Desain	0,04	,059	,692	,489
Operasional	<-->	Bencana	0,22	,072	3,122	,002
Administrasi	<-->	Bencana	0,35	,091	3,837	***
Administrasi	<-->	Operasional	0,30	,093	3,222	,001

Table 5. Correlation between Variable problems/Risks

The problem the Administration has a significant correlation with operational problems and disasters, but not on the issue of design, availability and safety. Administrative problems in the form of licensing is able to lead to problems further on the operational aspects and operational aspect of this was the signal edge of chaos.

In addition, there is also the problem of the availability of labour due to the Manager must add resources from the sea to anchor installation consultant for process of piling column. Similarly, there has been a problem of funding the project and the amount of labor that is less berkecakapan is available.

In line with this, the problems of the existing project mutually correlated. Correlation tables can be created from the interconnectedness between matter as follows.

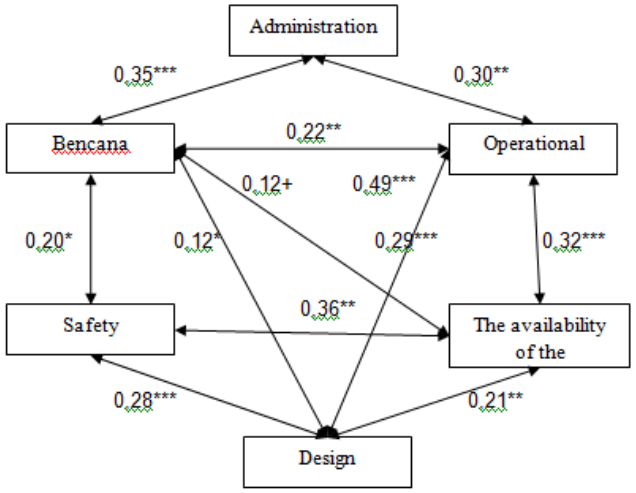

Fig 8:- Mutual Correlation between Research Variables

Description; p < 0.001; ** p < 0.01; * p 0.05 <; + p < 0.10

The picture above shows if the signal edge of chaos, i.e. operational availability, and positively correlated with all other issues, except the availability that are not correlated with the administration. However, the issue of the administration of the operational problems are correlated with fixed, so even though the Administration not to bring issues to the problem of availability, but the Administration can bring problems on operational issues, which also is an early warning signal. As far as administrative problems, disasters, safety, and design do not carry on operational problems and problems of availability, the project still has not been on the edge of chaos. But if one of the problems have arisen, whether operational problems or issues inventory, early warning has appeared. The signal is certainly the stronger operational issues and problems if the supplies occurs simultaneously because both signals this will impact badly on the performance of the project. When these two problems have emerged, the project has been on the edge of chaos.

In line with the results and discussion above, then a model of early warning when the project is on the edge of chaos are shown as in Figure 9. below.

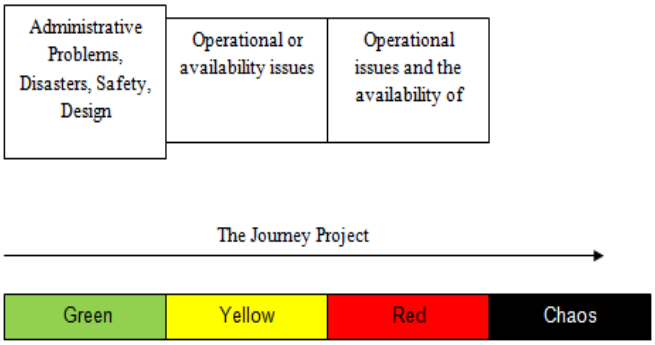

Fig 9:- early warning Model of Edge of Chaos

The picture above shows if the project is still far from the edge of chaos (green) If you only get the problem the Administration, disaster, safety, and/or design. Managers should start caution (yellow) when operational problem or a problem of availability arises. If the two issues appeared, then the system has been in the red zone namely zone edge of chaos. If there is no action decision making to solve the problem, then the system will enter into chaos because the performance has been affected.

- *Innovative Decision-Making Model in Situations of Edge of Chaos*

Innovation of the project is "the use of knowledge to create new ways (or perceived) to solve the problem of the project to change the project went on for the better" (Neuman et al, 2009). In the context of chaos management, problems that occurs of course carry on impulse for managers to think innovative, because the solutions of linear standards will most likely fail. This is in line with the views of Callaway (2009:41) that the management of chaos forced the managers do a rethinking about a variety of things, including the implementation of the project.

Innovative decision-making model can be taken from the description of the resource person about what they have learned from the experience of the project. Lesson learned is part of knowledge management. Knowledge management is aimed at "coordination and systematic against human beings, technology, process, and organizational structure within an organization to add value through re-use and innovation, achieved through the creation, Division, and the application of knowledge, as well as through providing valuable lessons that have been dipelajar and the best practices in corporate memory to encourage continuous learning organization "(Chandra, 2010).

Of the two speaker, note the existence of the things learned from handling the project. In the case of CTP Balantang, speaker understands that there are other issues besides the technical issues in the management of the project. In addition to technical issues, there are also social issues and operational issues that must be faced together to complete.

The issue of coordination of construction works is an operational issue, so does the booking tool and mobilization project material stake. Meanwhile, efforts to reduce the pollution of coal during excavations in some areas for the storage of material is technical issues. Social issues in the form of labor recruitment problems. There are also other technical related issues need for the addition of a pole a stake exceeding planned.

CTP Balantang cases demonstrate the importance of coordination, booking, mobilization, mitigasi, recruitment, and actual needs are planned from the beginning. The magnitude of the problems that arise can be staggering for managers because it is not taken into account previously. Social issues in particular, rarely addressed in the planning of the project.

Related problems of coordination in complex projects, Wettstein (2012) mentions the existence of the two coordinating patterns that are related to decision making. First, the coordination of the negative. Negative coordination occurs when the parties involved are focused on a review of the potential negative impact and refused to do the job with the negative impact. This means that the parties to preserve the status quo and not interested in innovative decisions. The situation of edge of chaos is a situation with a lot of potential negative impact. This situation is not desirable for the parties in a situation of coordination. They will avoid innovative decision-making and responsibility of each throw.

Second, positive coordination. On coordination of positive, all sides do simultaneous discussion of the problem and take out various alternatives that may be associated problems. The decisions taken will be supported together and each party trying to contribute. The decision was formed in an

attempt to solve several problems at once that interrelation, in accordance with their respective scope.

According to Wettstein (2012), positive coordination difficult to be implemented even if all project members agree to take innovative decisions. The more parties involved, the more difficult it is to find words agreed and ultimately positive coordination situation reached a stalemate.

Nevertheless, the case of CTP Balantang indicates if positive coordination is possible. The solution can be obtained through the discussion along with all the relevant parties. This solution is not only the solution to one problem, but also a number of problems that arise from technical aspects, social, as well as operational.

Positive coordination, in turn, leaning on the theory Y from McGregor. According to the theory of Y, the nature of the project members are (Jayram, 2001):

1) project work is viewed as a natural situation, similarly like rest or play.

2) Project members will direct yourself and controlling yourself if committed on the purpose of the project.

3) Project members can learn to accept and even took responsibility.

4) Ability to make innovative decisions are spread on the whole project, not merely limited to the position of project management.

- Conversely, negative leaning on coordination theory X, also from McGregor. Theory X States that (Jayram, 2001):

1) Project members are inherently does not like his job and whenever it could be trying to avoid him.

2) Because members do not like the job, they must be coerced, controlled, or threatened with punishment to achieve project goals.

3) Members will avoid responsibility and seek formal direction whenever possible.

4) Most members would place security above all other factors related to the project and does not indicate the existence of ambition.

Theory Y is valid in the case of CTP Balantang since stakeholders liked the project and try to contribute positively. In line with this, the members do not need routine to solve the problem. They are able to coordinate and jointly solve the problems encountered in the implementation of the project.

This coordination forum itself has its own risks. Meeting to discuss solutions to the problem of containing risk if certain parties felt rejected or treated unfairly, or don't get the voice (the voice is ignored) in the discussion. There will be a number of suggestions for problem solving and among these suggestions, there is only one received or some synthesized into one solution acceptable. In this situation, some suggestions will be challenged and criticized. The party filing the advice can feel offended because the criticism reflects the low quality of the suggestions put forward. Therefore, it is very important that the debate happens in innovative decision making between the parties concerned for constructive in nature. In order to be constructive, the idea and the parties should constantly be realized with a common purpose.

Even so, the decision making in Indonesia and other kolektivis countries tend to be more easily reach agree minimally with more deliberation and conflict. This is because the deliberations within the community kolektivistik tend to be leaning on a professional and ' influential people ' (Min, 2005). This is in contrast to deliberations on society individualist where each party is pushing his opinion on the principle of individual egoism. This can not be constructive because ordinary people can bring up ideas that are just as good or better than professionals. Indeed so, in situations where the common interests at stake, a little a lot of professional people or influential will listen to the voice of ordinary people as long as ordinary people have the feeling of urgency and are given the space to speak. Professionals and influential people in situations like this the people who acted as ' wise '.

In this forum, client projects have an important role in building communication, collaboration, decision-making is important and innovative project implementation, as well as by other stakeholders (Al-Tayeh, 2017). Although explicitly visible that PTVI is client projects in the case of CTP Balantang, the community also is actually a hidden clients. This is because the location of the CTP Balantang different to the location of the mine (plant site) and to reach the location of mines, vehicles must pass the way society (Malili-Sorowako). This road special road status although the mines, but has been exploited by the community for decades and has been considered as a path together.

Awareness of the public as a client along with the CTP project PTVI Balantang is very important to the success of the coordination is positive. The communities involved as stakeholders then give inputs to problem solving in the distribution of the mast pole as needed.

Meanwhile, in the case of an Upgrade, MPJ speaker understand the need for stakeholder mapping before the maturation process of execution and mitigation plans are required in the implementation of the project. Stakeholder mapping function to find out which parties have to be consulted in problem solving as well as the tools to figure out so that the parties can be catered for their needs in implementing the project.

Theoretically, stakeholder Mapping aims to support decision making and action in the project (Fistis et al, 2015). According to Fistis et al (2015), mapping the stakeholders

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stakeholders put on four types of actions that need to be done i.e. intensive dialogue organization, delivery information, the giving of satisfaction, and minimum effort. Stakeholders are placed on a field of two dimensions based on the needs and strengths. Quadrants in a stakeholder map can be seen in the example in Figure below.

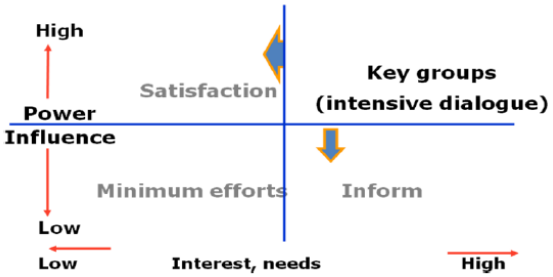

Fig 10:- The Framework Map Stakeholders

Source: Fistis et al (2015)

In the picture above, can be identified the four quadrants are:

- Stakeholders with high strength but low interests. Examples of stakeholders with high strength but low interest are collaborators and NGOs. The action taken on this group is to give satisfaction to them.
- Stakeholders with high strength and high interest anyway. Examples of stakeholders with the power and the interests of owners and clients is high. Steps that should be taken is to conduct intensive dialogues. They also referred to internal stakeholders.
- Stakeholders with low power and low interests. Examples of stakeholders in this category are the key suppliers. Efforts are being taken to a minimum for this group.
- Stakeholders with low power but high interests. This is a group of employees. Some key suppliers can also belongs in this group. This group should be given the information continuously.

As gleaned from the results of the interview, the speaker has done the communication with all internal stakeholders PTVI so getting a solution that is considered the best to solve the problem. Fixed a problem that comes up seems to be caused by the lack of the ability identified a number of stakeholders in the right position. For example, the Service Relationship of the Sea (Hubla) is actually a stakeholder who is strong but not identified at the outset. This leads to the problem of sustainable at sub contractors who feel dissatisfied with contractors late take care of licences.

Project management skills, communication, coordination, and reporting essential to collaborative relationships with a number of categories of stakeholders (Fistis et al, 2015). This relationship also requires knowledge of the details of the activities, goals, and interests of each stakeholder and there needs to be a permanent dialogue. Stakeholders can be categorized into two:

- The main stakeholders, including the business partners/suppliers/consumers, investors, clients, employees, and local communities.
- Secondary stakeholders, including the authorities, competitors, unions/labor, media, and NGOs.

Parnell and Driscoll (2011) observed that the inability to identify stakeholders led to the inclusion of stakeholders, and resulted in a failure in completing the project. Managers need to identify all potential parties are affected in a project. After this identification, the Manager divided them into eight groups based on three dimensions, namely power, urgency, and legitimacy. Based on these three dimensions can be retrieved eight types of positions, as illustrated in Figure 11.

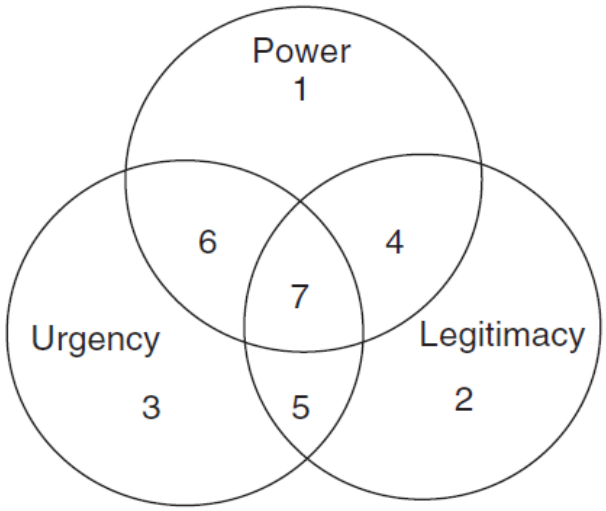

Fig 11:- Type of Stakeholder Positions

Source: Parnell and Driscoll (2011)

The eight kinds of the above positions, among others:
1. Non stakeholder. Non stakeholder is any group which could not be placed on the Figure

2. A group of sleeping (dormant). This group has the power but not urgent necessity (urgent) to met and has no legitimacy.

3. careful Group (diskresioner). This group has legitimacy but has no power and it is not urgent.

4. the claimant Groups. This group has a high urgency but does not have the power and legitimacy.

5. The dominant group. This group has the power and legitimacy but not urgent.

6. The group depends. The group depends on having the urgency and legitimacy but does not have power.

7. The group is dangerous. This group has the power and urgency but does not have legitimacy.

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8. definitive Groups. The Group was in power and has legitimacy as well as having a high urgency.

After the groups are identified and their needs are identified, managers need to choose which stakeholders who should be prioritized, visualizing their relationships with the project, develop a strategy of involvement, and oversaw the change of hand in hand time (Parnell and Driscoll, 2011).

Stakeholder mapping framework from Bourne and Weaver (2010) is a framework that can be very prioritisasi in taking decisions operational stakeholders. Framework of the Bourne and Weaver (2010) mapping the stakeholders in four criteria, namely:

- Power. Power reflects how much power a stakeholder in resulted in changes in the project. Awarding of rating are as follows:

1) Values 1 = power is relatively low. Stakeholders in General can not result in a change that much.

2) value 2 = informal capacity to result in changes significantly. Stakeholders have the capacity to lead to change.

3) value 3 = there are formal capacity to order changes. These stakeholders must be informed or have to give permission.

4) value 4 = high formal capacity to order changes. These stakeholders can stop the work.

- *Proksimitas. Proksimitas relates to how closely the work being done by stakeholders. The given rating include:*

1) Values 1 = relatively far from jobs. Has no direct involvement with the process. An example is the client and the majority of senior managers.

Value 2 = 2), regardless of the job but make contact regularly with, or input into, the process of the work.

Value 3 = 3) is regularly involved in the work. An example is a part-time team members, external suppliers, advertisers and sponsors.

4 = 4) value was directly involved in the work. It is a member of the team that works most of the time.

- *An value. Values reflect how big those owned betting stakeholders on the work or its effects. Rating given:*

1) Values 1 = very low. Don't have or have a very small stake in the external project.

2) value 2 = low. Aware of the project and has an indirect stake in the external project.

3) value 3 = moderate. Have several betting directly with external projects.

4) value 4 = high. Looking at external projects as something important (benefit or threat) for stakeholders.

5) value 5 = very high. Have a huge personal stake in external project (success/cancellations).

- *Actions. The action shows how likely if the stakeholders will take action, positive or negative, to influence the project and the façade. The existing rating include:*

1) is very low: the possibility is very small for trying to influence the project.

2) low: potentially trying to affect the project.

3) Being: can prepare for trying to influence the project.

4 High): likely will make significant efforts to influence the project.

5) Very high: activated on its own, will try as far as possible influenced project.

The value of these four variables are then added to obtain the final value that determines the degree of urgency of any stakeholders to quickly overcome. 5.2 the following table provides examples of calculations for four types of stakeholders.

The name of the	The role of the	Power	Proksimitas	The value of the	Action	Total	Priority
Brown	Sponsor	4	3	4	4	15	1
Green	Designers	2	4	3	5	14	2
Jones	Architect	2	2	3	1	8	3
Smith	CEO contractors	2	1	2	2	7	4

Table 6. Example determination of priorities of Stakeholder

Source: Bourne and Weaver, 2010

In addition, managers also need to have a clear mitigation plans to address various risks. Mitigation plan not only for the sake of guaranteeing success in running projects but also (1) building a culture of proactively fixes, (2) increasing the confidence and satisfaction of consumers, (3) improving the efficiency and operational governance in proactive, (4) allows the Organization to apply the control management system to analyze risk and minimize losses, (5) allows organizations to respond to changes effectively and protect the business as it grew, (6) guarantees the consistency of the quality of goods or services, (7) build a strong knowledge base, (8) build confidence stakeholders in the use

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of the techniques of risk, and (9) enhance performance and resiliensi management system (BSI, 2015:3).

For that, of course, required the identification of risk and the time since the beginning of the project. Information about the risks and how to mitigasinya need to be propagated to all members of the project and are always available to be referenced when the risk of teraktualisasi. When the plan is not as expected, mitigasi plan implementation running so the project remained on track. 5.2 the following table gives examples of forms of mitigation plans. This table can be expanded by adding the severity. The severity of the splayed ranging from negligible (1), (2) minor, (3), (4), and (5) destroy everything (Deysher, 2015).

The risk of	The impact of the	The possibility of	Mitigation
The client's failure to achieve the target growth	Poorly performing financial models/damage to reputation	Is being	• realistic Modeling • Phasing of the good • intensive Connection • high caliber Management • a good selection Procedure • growing market presence
Significant delays	The goals are not met within the time period and the funder, as well as stakeholder withdrew	Is being	• Improve communication with and between stakeholders • agreement with all funders regarding financial contributions and application time • the support of key government officials
The company is not able to pay	as well as stakeholder withdrew	Is being	• -high caliber Management • -the ratio of staff management with clients 1:10 • -provide services that add value • -contract (wages and participation)
Failure management	The provision of services is not enough	Is being	• -funding for high calibre management • -a good Board to attract high calibre management • -Selection of high calibre management
The model fails	Failing to achieve targets	Is being	• -a review of models every year • -high caliber Management • -help the Council review and refinement
The Board failed to	Leadership/governance is insufficient	Low	• -the selection board • -training of the Board • -high caliber incubator Management
Funder failed to support the project thoroughly	Funding is not enough	Low	• -a consortium of donor coordination and • -pre-funding Agreement implementation

Table 7. Mitigation Plan Example

Source: Brethenoux et al, 2011

Positive stakeholder mapping, coordination, and mitigation of risk is a crucial element in the model of innovative decision-making in situations of edge of chaos. Stakeholder mapping and risk mitigation plan if implemented allows positive coordination occurs at a time of emerging issues in the field. For example, when the funder failed supported the project as a whole, managers can directly lead to alternative donors who had previously been well managed through stakeholder mapping framework. Contacts that occur are positive coordination which in turn fosters innovative solutions to the problem that has been piling up. Overall, a third of these factors become the framework of relations between variables in chaos theory.

In line with this, the assumption of theory Y, identification of stakeholders, and the identification of risk into constraints that mengkendalai innovative decision-making process. If it turns out not behaving in accordance with stakeholder theory Y, but rather follow the theory X, innovative decision-making process difficult. The Manager will be forced on traditional decision-making process based on risk mitigation framework. Similarly, if the stakeholder identification failed, the stakeholders that could potentially contribute innovative solutions can not terkenali and masalahpun only partially resolved. Meanwhile, in the absence of the identification of risk early on, managers do not have the basic knowledge that is required to take the traditional solution, let alone innovative solutions.

Note though that the risk mitigation planning puts decision-making in the early planning of the project. This gives rise to the impression that the processes that are running are not innovative. When a problem occurs, managers stay refers to risk mitigation framework rather than doing innovative decision making. However, innovative characteristics will still be going on if the Manager is located on the edge of chaos. This is due to that at this point, there are various problems that accumulate and affect each other so that the solution of the risk mitigation plan is simply an alternative to the alternative. Some other alternatives may be more potent. Alternative risk mitigation plan provided only a single problem on directional while the situation at the edge of chaos contains many problems accumulate. This solution can be taken but managers need to combine it with other solutions so that the whole problem can be solved simultaneously. This is where the role of stakeholders and coordination of positive maps. Mitigation plans still have a role but he needs to be reinforced with positive coordination in order to produce more innovative mitigation and comprehensive.

The sudden chaos system in project management in the above case could potentially produce a better system and solve the problem through risk mitigation that are supported by positive coordination and stakeholder mapping. Stakeholders involved and consulted brought together to solve problems in a constructive coordination which is armed with the knowledge of the managers about the risks as well as knowledge of other stakeholders are also a bit much find out other aspects of those risks.

Interestingly, Patanakul et al (2010) does not see the importance of stakeholder analysis is performed. The reason analysis of the stakeholders do not significantly impact the success of the project. This is unusual because the researchers use a framework for stakeholder theory conceived of the success of the project, namely the internal perspective, customers, business, and overall. Nevertheless, they recommended the creation of a communication plan at the stage of conceptual and stages of execution. The reason is because of a communication plan specifying communication channels at all pertinent stakeholders who require information and when to get them. Communication plan benefits all stakeholders because it helps manage the flow of information (Patanakul et al., 2010). Nevertheless, the communication plan can not walk with a thorough if not identified stakeholders since the beginning. Therefore, any stakeholder mapping is of course important to ensure the success of the project in a situation of edge of chaos.

In addition to the communication plan, Patanakul et al (2010) mentions a number of risk management tools such as the matrix of risks, analysis of Monte Carlo, decision tree analysis, checklists, contingency plans, SWOT analysis, delphi, risk audit project, and the management value of revenue. From a number of these risk management tools, checklists and contingency plan risk management tool was found significantly influenced the success of the project. Checklist to run on the stage of execution of the project. The checklist is not another list of all the items that are needed so that they can be ascertained there and used properly.

Contingency plans in research Patanakul et al (2010) is regarded as an important component in the success of the project. Contingency plans include risk mitigation aspects as described above. Contingency plans themselves are taken if the risk of experiencing manifestations. However, contingency plans must be consulted in advance to obtain innovative solutions that are more comprehensive and menyasar problems.

Another problem in the implementation of projects that come up is the use of local labour. These concerns relate to human resource management project. Human resource management projects can be managed with the stakeholder analysis, a matrix of responsibilities, activities development team, the system of rewards and recognition, organization chart, and a directory of project teams.

Initiated creative solutions solve the problem but still there are residual effects is presented. In the case of Mangkasa Point, management of the process goes according to existing standard but the project lost time and issue additional money in the process of its implementation. That is, it would be better if there were no problems at all than there is a problem. This is contrary to the thesis management of chaos if the challenges that are on the edge of chaos may cause the effectiveness that is much better than before. However, with only two samples, this seems less convincing. Moreover, as in the case of CTP Balantang issue resolved and had no impact on the cost of construction. This is consistent with the view that most of the chaos thus are destructive to the project implementation due to the reduction of consistency and efficiency (Kerzner, 2013:405).

In line with the results and discussion above, then the decision-making model is innovative on edge of chaos shown in Figure 12.

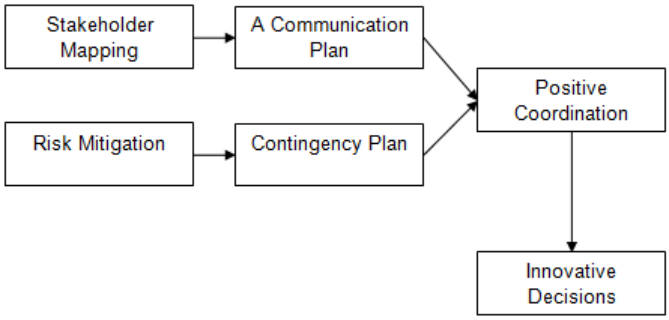

Fig 12:- The innovative Decision-making Model of Edge of Chaos

The model above shows that the decision to be rendered via the innovative positive coordination between stakeholders. This positive coordination can occur if the stakeholders have

been mapped and there is a communication plan that enables project managers to contact and bring together stakeholders in a climate positive coordination. Meanwhile, risk mitigation also is very necessary because it allows the existence of a contingency plan being the initial solutions for capital project manager who will then be discussed with the stakeholders in order to produce innovative decisions.

VI. CONCLUSION

The pattern of PLC mining company in Indonesia consists of a conceptual phase, planning, execution, and termination. R & d projects including the conceptual stage. The initial design, budget approval, to the granting of the contract is the planning phase. Stage management permission until commissioning is the stage of execution. Phase transition of the hand and the closing phase is termination.

Early warning Model shows that the project is on the edge of chaos when operational problems occur and the problem of the availability of a time. Early-warning signals can arise at the time when the project is experiencing any of the issues above. The situation is still under control of the project if the project only administrative problems, disasters, safety, and design.

Innovative decision-making while at the edge of chaos is presented through positive coordination between stakeholders of the project. This positive coordination can occur if there is a contingency plan and communication plan of the project manager. The communication plan should be preceded by mapping the stakeholders. Contingency plans must be preceded by risk mapping and mitigation.

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