

## SUPPLIER BUYER RELATIONSHIP SELECTION USING SUPPLY POSITIONING MODEL METHOD

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### ABSTRACT

*PT Kalimantan Prima Persada (PT KPP) is a company engaged in the service industry and coal mining contractors. To meet the needs of its customers, PT KPP must face the competition among other coal companies. One way to retain customers is to maintain good relationships with suppliers who have contracts of cooperation with PT KPP. Supplier has a special role in business continuity because the supplier who provides the device operating heavy equipment and perform maintenance at the same time. So, we need sustained relationships contained in the procurement of goods. Logistics Department Procurement PT KPP especially spare parts for the units on the site of Tanjung Alam Drilling in the period 2010 (January to December) there were 234 items spare parts, with total purchases amounting to Rp. 2.790.531.890. By using the method Supply Positioning Model, the obtained 4 quadrants of 99 routines by a number of goods, leverage of 31 items, bottleneck and critical number of 79 items of 25 items. Based on these results can be recommended Buyer Supplier Relationship appropriate to obtain the continuity of good relations with suppliers. Results of the Buyer Supplier Relationship recommendation is procurement strategies and contract types in accordance with the method Supply Positioning Model. The cooperation contract recommendations for quadrant bottleneck, critical, leverage is long-term cooperation contract (consignment) and quadrant routine is a direct purchase (Purchase Order).*

**Keywords:** supply positioning model, procurement, routine, leverage, bottleneck, critical

## 1. INTRODUCTION

### 1.1. Background

One of the companies engaged in energy, especially coal, is PT Kalimantan Prima Persada (PT KPP) which is also a subsidiary of PT Pama Persada Nusantara engaged in the service industry and coal mining contractors. Coal mining at present is promising business in Indonesia is marked by such rapid growth and development of coal mining companies.

It is also, of course, coupled with the high demand for Indonesia coal for both local and overseas consumption. Coupled also with the policies and government support to promote and expand the power plant that uses coal as the main priority in electricity procurement program in the future (source: National Coal Study Team, Study Group Mineral and Coal Policy, Research and Development Center for Mineral and Coal Technology, 2006). It can be seen from Figure 1 that the increase in sales of coal increased annually. When viewed from the existing data, business management of coal

and related businesses if managed professionally and properly directed, it will become the most profitable business with a rate of return and profitability are high.

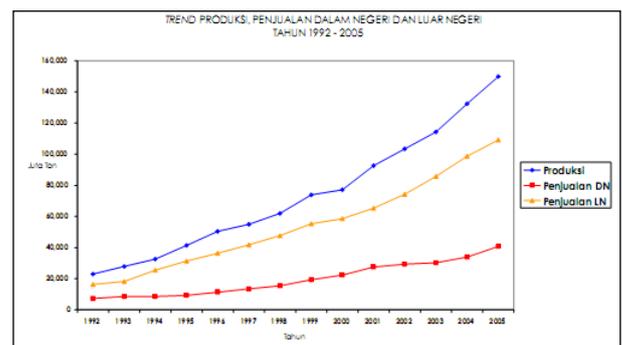


Figure 1. Sales of Coal Production Trend, 1992-2005

(Source: Tim Kajian Batubara Nasional, Kelompok Kajian Kebijakan Mineral dan Batubara, Pusat Litbang Teknologi Mineral dan Batubara, 2006)

High profitability will be achieved by the company if it can reduce the cost of coal used to process them. Can be seen in

Figure 2 occurs expense maintenance repair cost 2010 on the machine that is the expenditure that companies use to workshop stations, spare parts, direct cost, oil and add accessories. From Figure 2 shows that spare parts is the biggest expenditure is expenditure on spare parts, Rp. 131 653 080 000. As well as costs incurred expenditure in excess of those planned (plan) with reality (actual) called over budget. In 2010, Plan Repair Maintenance (Cost Expense) over budget at a workshop station at 47.17%, spare parts amounted to 74.39%, oil amounted to 63.61% and 46.56% add accessories.

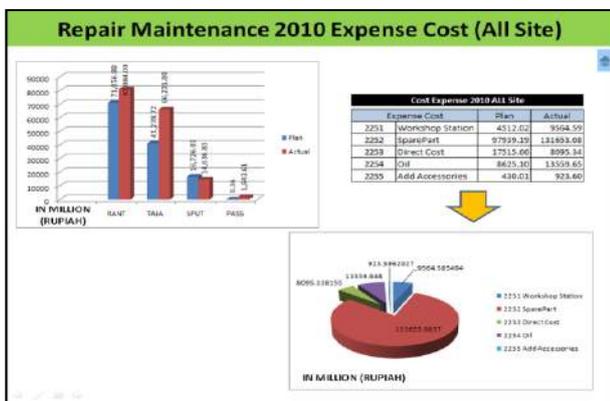


Figure 2 Repair Maintenance 2010 Expense (Source: PT Kalimantan Prima Persada, 2010)

To maintain the quality of the company's service industry and coal mining contractor, PT KPP required to meet the wishes of the customer. In addition, to make sure to avoid breakdown/ disruption on heavy equipment such as the one in Figure 2, the maintenance repair using the cost is quite large (over budget).

One way to maintain quality and reduce breakdown and reduce the over-budget is to maintain good relationships with our suppliers who have contracts of cooperation with PT KPP. Supplier has a special and strategic role in maintaining business continuity for suppliers that provide device operating heavy equipment and perform maintenance at the same time. By maintaining good relationships with our suppliers, it is hoped there will be a sustainable relationship that ensure continuity of business between them.

Sustainable relationships are included on the procurement of goods. Procurement of

goods is one of the basic functions common in all types of firms because firms can not operate properly without it. Judging from its nature, the procurement of goods is fundamental and integral part of business management. With the effective procurement of goods that the company will reduce costs because the process of production and business processes will not be disturbed.

One step to do an effective procurement of goods is by considering the role of suppliers. To get an effective procurement of goods can use the method of Supply Positioning Model. Method of Supply Positioning Model is a tool used to map the relative importance of each weight of each item so that the output of the Supply Positioning Model method to determine the type of contract in accordance with the characteristics of the goods.

Therefore, it required a determination of buyer supplier relationship for the supplier who has entered into an agreement with PT KPP to determine procurement policy based on classification of goods in order to improve quality. Hopefully, the results of this research as a recommendation to the PT KPP in maintaining good relationships with our suppliers and as a further strategy. Examining supply chain system based partnership to determine the buyer supplier relationship in conducting the procurement method that is probabilistic Supply Positioning Model into the background in conducting this research.

In this study, conduct the formulation of the problem based on the background, namely:

- 1 How to classify goods using the Supply Positioning Model at PT Kalimantan Prima Persada?
- 2 How procurement strategy based on the method of Supply Positioning Model at PT Kalimantan Prima Persada?
- 3 How to determine the contract in accordance with the method in the Supply Positioning Model PT Kalimantan Prima Persada?

In making this research there are some limitations which are research carried out only until the system policy specifies a partnership with suppliers, not reached the stage of negotiation. Financial factors in the

supply chain system that flows between the entities are not considered in this study.

## 2. THEORETICAL BACKGROUND

Supply Chain Management is a set of approaches used to integrate efficiently between suppliers, manufacturers, warehouses, and shops, so that goods are produced and distributed with the proper quantity, the exact location, and the right time, to minimize the costs on the condition that satisfying service level requirements (Levi, and friend, 2000).

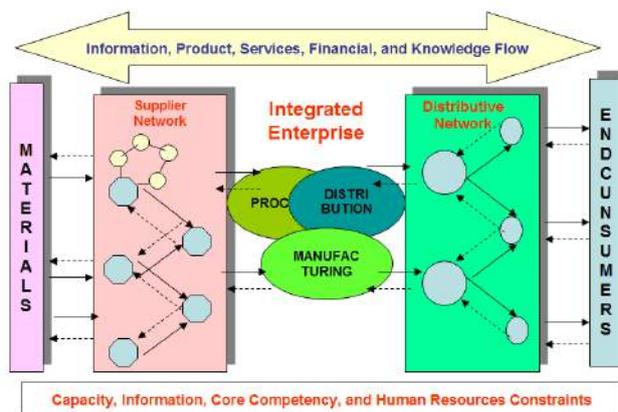


Figure 3 Supply Chain Management (Source: SCM: Strategy, Planning, and Operation, 2004, Chopra and Meindl)

### Supply Positioning Model

Supply Positioning Model is a tool used to map the relative weights of items of interest from the purchase of goods or services (Crouch, 2002). There are two factors that influence the level of interest, namely: Level of purchases of goods per period, The graph on the Supply Positioning Model method has two directions. Horizontal, to classify the level of expenditure of an item. All spending on high-value goods (20% of the goods represented 80% of the total value of purchases) will be arranged on the right side. All goods are of low value purchases (80% of the goods represented 20% of the total value of purchases) will be arranged on the other side. Another option using the ABC system for classifying goods purchases. "A" are goods obtained from 60% -70% of total spending, "B" are goods obtained from 20% -30% of total spending and "C" are goods obtained from 10% -15% of total

expenditure. To view the results of the classification level of expenditure of an item using the ABC system can be described by using a Pareto diagram. Pareto diagram is one of the QCC tool to determine the principal causes of the priority that must be resolved. Goods which must be prioritized is valuable and usually only 20% of the total goods.

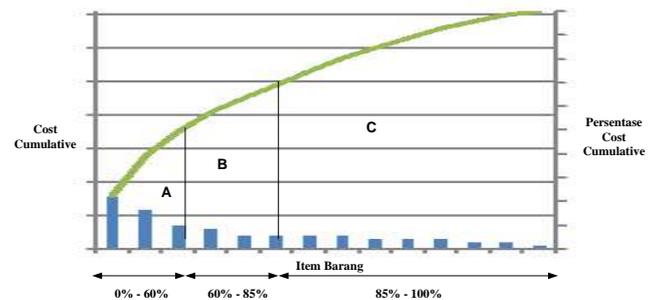


Figure 4. Pareto Diagram (Source: PMI UK Chapter Event, October 7th, 2003, Douglas S MacKellar)

Supply Impact, Risk, Opportunity dan Availability (Risk Level)

This marks the level of assessment is combined in a discussion, about the consequences that will occur on the company and is usually associated with loss of earnings if not able to find the target inventory for a particular item. If you can measure a broad inventory of goods in market conditions and will require certain businesses to avoid the risk of supply or the unavailability of the target can also take advantage of the opportunity to inventory and will make the company win the competition.

## 3. RESEARCH METHOD

Based on Figure 3 explained that basically the plan on the use of machinery, machine unit overhaul plan, plan periodic maintenance, and unpredicted breakdown is at the root of the problem to be solved in this study. Can be seen the input of the problem is the need for stocks of goods (especially spare parts) to address these problems. The output of inventory needs (especially spare parts) are the data needs inventory (especially spare parts) that must be met.

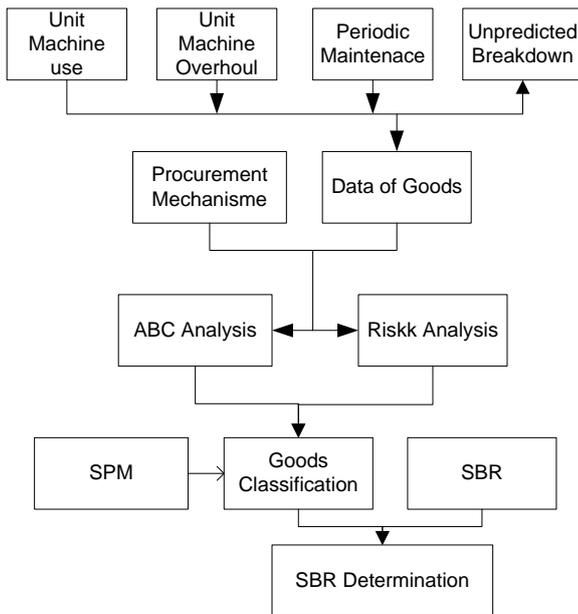


Figure 4 Conceptual Model

With input from the purchase of inventory data (especially the spare parts), should be carried out procurement for goods demands are met. Therefore, it needs a mechanism for procurement of goods inventory needs can be fulfilled.

From the data of purchase of goods and procurement mechanism will be an analysis of these data, namely the purchase of goods ABC analysis and analysis of risk levels. Analysis of ABC's purchase of goods which classifies the purchase of goods (A, B, C) obtained from the percentage of total expenditure. While the level of risk is seen to mark the level of assessment is combined in a discussion of such impact, risk, opportunity and availability of supply.

Predictive analysis is obtained based on the method of classification of goods Supply Positioning Model is characterized by 4 types of goods items (Routine, Leverage, bottlenecks, and Critical). Obtained the output of goods will be classified based on the Supply Positioning Model method of procurement is carried out based on data purchases. Classification of goods are processed into the determination of Buyer Supplier Relationship supported by Buyer Supplier Relationship theory in order to have the type of contract of cooperation based on classification of goods. After determining the Buyer Supplier Relationship of the proposed improvements and the prioritization of

repairs to the determination of buyer supplier relationships.

Based on conceptual models and explanations before the systematic implementation of problem-solving research are as follows in figure 4.

#### 4. RESULT AND DISCUSSION

Based on the results obtained any data for a given level of risk of each item. For example, risk-level data items for spare parts drilling.

Value	Risk Level
$1 \leq \text{Risk Level} < 2,5$	Risk Level L
$2,5 \leq \text{Risk Level} < 3,5$	Risk Level M
$3,5 \leq \text{Risk Level} \leq 4$	Risk Level H

To obtain the risk level of Trycone Bit 6-3/4 "S30, it is known that Trycone Bit 6-3/4" S30 has:

- impact (M) = 3.....a
- risk (M) = 3.....b
- supply opportunity (H) = 4.....c
- availability (M) = 3.....d
- the level of risk =  $\frac{a+b+c+d}{4}$

= 3.25 → Medium risk level (M)

#### Analysis of Purchasing Goods Using ABC Analysis

This analysis classifies all kinds of items based on their importance and the size is the price (Rupiah) involved in the procurement of goods for the drilling unit. The higher costs are absorbed for the procurement of a particular type of goods it is increasingly important also to note. In the method of analysis of this ABC is that the input data for the purchase of goods drilling unit which includes the price of goods and the quantity of goods required.

Processing is done is to sort the data based on the total cost of purchase of goods (largest to smallest) and calculated the percentage of purchases for each item based on total expenditures. Ordering sales rankings conducted to determine the type of goods included in the ABC group. For group "A" Cumulative Cost Percentage = 0% - 60%, group "B" Cumulative Cost Percentage = 60% - 85%, and group "C" Cumulative Cost Percentage = 85% - 100%.

For example to get the classification of purchases of goods using the ABC method

of Trycone Bit 6-3/4 "S30, it is known that Trycone Bit 6-3/4" S30 has:

Total cost = Rp. 293.300.000..... X  
 Total purchases = Rp 2.790.531.890..... Y  
 Cost cumulative =  $X_n + Z_{n-1}$ ..... Z  
 Cost % cumulative =  $Z = \text{Rp. } 293.300.000 + 0$   
 $Y = \text{Rp. } 2.790.531.890$   
 $= 10,51\% \rightarrow A$

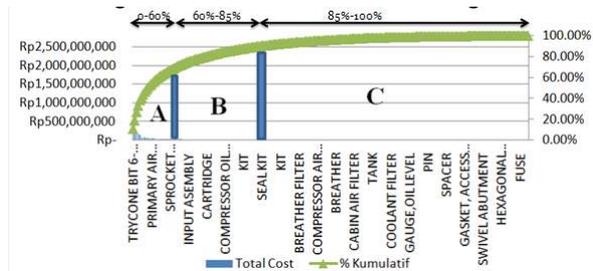


Figure 6 Diagram of Purchasing Goods ABC Pareto Analysis

**Classification of Goods Supply Positioning Model Based Methods**

Supply Positioning Model method divides the type of goods into 4 quadrants that is routine, leverage, bottleneck and critical which have characteristics that differ from one another. To classify goods according to Supply Positioning Model method requires input of groups of items based on analysis of ABC's purchase of goods and the level of risk (impact, risk, opportunity and availability of supply.) Processing is done with the method of Supply Positioning Model with reference to the classification as follows: The image quadrant grouping items based on the results of Supply Positioning Model methods can be seen in the image below:

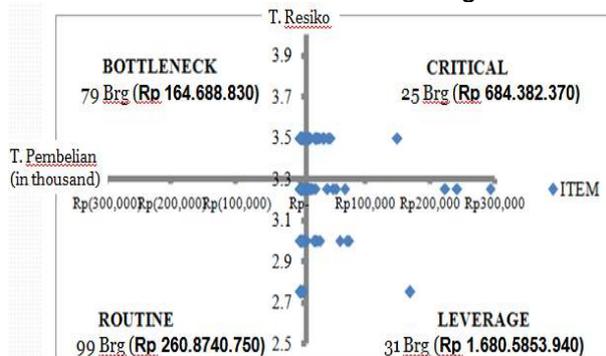


Figure 7 Quadrant Classification of Goods Supply Positioning Model Based Methods

**5. CONCLUSION**

The problems that occur can be identified based on research already done, namely:

- The number of items purchased for drilling units (Sandvik, Tamrock, Drilltech) site Tanjung Alam PT Kalimantan Prima Persada in the period 2010 (January-December) of 234 items. Of 234 such articles do not have the appropriate grouping of items by looking at the level of risk and the total value of purchases of goods, thus requiring an appropriate method that is method Supply Positioning Model.
- For drilling unit has not been any engagement/ cooperation agreement to conduct the purchase transaction, the process of buying spare parts for drilling units using the process of buying direct. Thus it can be said that the strategy of buying goods for the purchase of spare parts drilling unit is still based on the request of the Ministry of Plan.

One way to overcome the problems that occur in the process of purchasing spare parts for drilling units is to use a method of positioning Supply Model. By using the method of Supply Positioning Model the expected grouping of goods with the view of risk and purchase goods. So the process of purchasing goods can be repaired and operational processes of production can proceed smoothly.

**Purchase Process Improvement**

The process of purchases made by PT KPP can be improved by way of grouping of goods in accordance with the method of Supply Positioning Models and improvement strategies in accordance with the purchase of goods quadrant grouping of goods.

**Supplier Analysis Perception of Procurement Strategy**

Strategy of suppliers in this case perception is necessary because eventually the supplier will choose according to that desired by the company where the goods have been classified into 4 quadrants in accordance with the Supply Positioning Model method that is routine, leverage quadrant, quadrant and quadrant critical bottleneck. Therefore, the necessary perception of the supplier on the 4 quadrants are thus divided into 4 quadrants also develop the quadrant, quadrant nuisance, exploits and quadrant quadrant cores.

**Determining Contract Classification Method for the Development Cooperation Supply Positioning Model**

Development of Supply Positioning Model classification method is to shift the position of goods bottleneck quadrant to quadrant routine and routine shift the position of goods and critical quadrant to quadrant leverage. Development can be achieved by determining the appropriate contract resulting from a shift in the position of goods in these quadrants are based on the method of Supply Positioning Model.

The contract is an agreement between two or more parties to perform any work that is based on the law. The purpose of this contract to preserve, maintain and enhance good relations with our suppliers. Based on the analysis bottleneck quadrant development, critical, leverage the appropriate contract is consignment, due basically to the quadrant and the critical bottleneck to reduce the risk. For the development of routine quadrant, then the appropriate contract is a direct purchase (Purchase Order)

Table 1 Strategy Overall Procurement

Kuadran	Supplier Quantity	Kind Of Contract	Contract Period	Type of Contract	Supplier Perception
Routine	More than one	short	6 month - 1 year	Spot Purchase	Nuitance
Leverage	One	Long	1 - 5 Years	Fixed Contract	Exploit
Bottleneck	One/Two	Long	1 - 5 Years	Partnership	Develop
Critical	One	Long	1 - 5 Years	Partnership	Core

**6. REFERENCES**

(a) Buzacott, J.A. and Shanthikumar, J.G. (1993) *Stochastic Models of Manufacturing Systems*, Prentice-Hall, Englewood Cliff, NJ.  
 (b) Chong, T. C., Anderson, D. C., Mitchell, O. R. (1989) QTC - and integrated design/manufacturing/inspection system for poismatic parts. *Proceedings of the ASME Conference on Computers and*

*Engineering, San Francisco, CA, 417-426.*  
 (c) J.P. Rennard. (2000) Introduction to genetic algorithms. <http://www.rennard.org/alife/english/gavintrgb.html#Evol>. Access date: 12 May 2008 at 14.00.  
 (d) Lapedes, A., and Farber, R. F. (1988) *How neural networks work. In D. Z. Anderson (ed), Neural Information Processing Systems (New York: AIP)*, chapter 12, 442-456.  
 (e) Sadeh-Konieczpol, N., Hildum, D., Laliberty, T.J., Smith, S., McA'Nulty, J., and Kjenstad, D. (1996) An integrated process-planning/production-scheduling shell for agile manufacturing. *Technical Report CMU-RI-TR-96-10, Robotics Institute, Carnegie Mellon University.*  
 (f) Swaminathan, J.M., Smith, S., and Sadeh-Konieczpol, N. (1998) Modeling the dynamics of supply chains: A multi-agent approach, *Decision Sciences*, vol. 29, 607-632.

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