OPTIMIZING SUPPLY CHAIN MANAGEMENT TO REDUCE PRODUCTION COST IN PT PLN BATUBARA (COAL TRADING)

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ABSTRACT

PT. PLN Batubara is a subsidiary of PT. PLN (Persero) which was established on 11 August 2008 with the purpose of conducting trade in coal procurement in an effort to secure coal supply needed by coal power plants owned by PLN or Independent Power Producers (IPP).

Supply chain management is a series of approaches, which integrates suppliers, manufacturing sector, warehouses, and stockpiles in order for goods to be produced and distributed in the right amount, location, and time to minimize system-wide cost and to fulfil the expected service quality.

Company operational losses are currently the most prominent problem faced by PT PLN Batubara. These losses are caused by inefficiencies in production cost. Production cost could be minimized through supply chain management. This drives the researcher to conduct a research regarding the optimization of supply chain management as a mean to reduce production cost in PT PLN Batubara. This research is conducted through a qualitative – descriptive method.

The analysis of internal and external factors through the SWOT analysis yielded a result that an enforcement in the strategic level is necessary to enact the optimization of supply chain management completely from the upstream supply chain, to the internal supply chain, down to the downstream supply chain.

Further findings of this research include the management implications usable by similar companies, which include coal-trading companies, in order to win the competition in the market. The least lesson could be taken is that the optimization of supply chain management could be applied as an effective solution in solving company problems. Differences would arise in the methods and steps taken in relation to the problem faced. One certainly similar component is the importance of the strategic level.

Keywords: optimization, supply chain management, SWOT, strategic level, upstream supply chain, internal supply chain, downstream supply chain.

INTRODUCTION

PT. PLN Batubara (State coal electricity enterprise) is a subsidiary of PT. PLN (Persero) (state Electricity enterprise, State owned enterprise) that was founded on August 11 2008 with the goal of conducting trading business in the field of providing coals as to secure partial supply of coals for the coal-fired power plants owned by the PLN, and also other coal usages based on the principle of healthy industry and business by applying the principle of limited liability company. The electricity system in Indonesia is divided into three working areas, namely Java-Bali, West Indonesia, and East Indonesia with generator systems provided by

PLN or Independent Power Producers (IPP). In order to fulfill the obligation to guarantee 20% of the supply of coal needs for PLN's coal-fired power plants, which are spread throughout Indonesia based on the assignment from PLN as the parent company, the certainty of production and the smooth transportation of coal distribution to the intended destinations are a must. The supply of coal is up to 20% of the needs of PLN'S PLTU or amount to approximately nine million tonnes, considering that current and future coal demand is very high, both at national and international levels.

One of the biggest losses faced by PT. PLN Batubara is caused by the inefficiency in production cost. Production cost can be reduced through optimization of supply chain management. One effort to reduce production costs is through optimizing the distribution of material from suppliers, material flow in the production process to the distribution of products to consumers. Here, optimal distribution can be achieved through the application of the concept of Supply Chain Management. Supply Chain Management is actually not a new concept. This concept emphasizes an integrated pattern that includes the process of product flow from suppliers, manufacturers, and retailers to consumers. From here the activity between suppliers to end consumers is in one unit without a large divider, so that the information mechanism between the various elements takes place transparently. Supply Chain Management is a concept concerning product distribution pattern that can replace the product distribution patterns optimally.

Based on the specific problem stated above (four questions mentioned above) therefore this study is titled "Optimizing Supply Chain Management to Reduce Production Cost in PT. PLN Batubara (Coal Trading)".

In addition, based on the study background explained above, therefore the research question of this study is: How to optimize supply chain through increasing production cost efficiency?

From the statement above the aim of this study is therefore:

PT. PLN Batubara can take strategic steps to optimize supply chain management which will automatically increase company revenue and profit.

LITERATURE REVIEW

This study is referenced from previous research, such as:

1. Study conducted by **Kenneth M. Mathu (2010)** titled **Supply Chain Constraints in the South African Coal Mining Industry.** This study explored South Africa coal mining industry and the role of its players in causing bottlenecks/ obstacles faced by the coal mining supply chain industry.

2. **Bob Heney (2013)** in a study titled **Supply Chain Visibility: A Critical Strategy to Optimize Cost and Service** revealed the background according to Aberdeen study on Supply Chain Officers, which are individuals facing heaviest pressure when facing complications in supply chain (such as: long lead times and lead-time variability, the increase of number of suppliers, partners, carriers, customers, countries, and logistic channels), as well as the increase in supply chain management costs (such as: total fund borrowed, fuel costs, labor cost, etc.).

3. **Daniel Szucs & Kedir Hassen (2012)** in a study titled **Supply Chain Optimization in the Oil Industry: A Case Study of MOL Hungarian Oil and Gas PLC** found that options to optimize oil supply chain is important because all cost savings will result in large sum of money for oil company, and therefore optimization is the center of focus in oil supply chain management.

4. Szucs & Kedir Hassen (2012) explored the supply chain management in oil industry and found options to optimize supply chain in oil industry by reviewing and analyzing previous literatures on topics selected for the study.

5. Study by G. Gunawan, Primiana, Rufaidah and K. Hidayat (2015) titled The Influence of Supply Chain and Strategic Orientation Throught Competitive Strategy and Its Impact on Coal Business Performance (Studies on Coal Company in Indonesia) observed the supply chain and strategic orientation and its impact on coal business performance. The result of this study suggested that the ability of Indonesia coal industry players in conducting supply chain management can be deemed satisfactory. Included here is in terms of strategic orientation and competitive strategy.

Positive performances can be derived from the success of aligning supply chain changes and business strategy orientation changes.

THEORETICAL BACKGROUND

Operation Management: According to Assauri (2011:12) production and operation management is defined as the activity to arrange and coordinate the use of resources consisting of human resources, equipment resources, and fund and material resources, effectively and efficiently, to create and add utility to a good or service.

According to Richrd B. Chase, Robert Jacobs, and Nicholas J. Aquilano (2009:6), *Operation Management is defined as the design, operation, and improvement of the system that create and deliver the firm's primary products and services."*

Supply Chain Management: According to Bratić (2011), the concept of supply chain is based on the formation of value chain links consisting of functional individual entities that are commited to provide resource and information to achieve managerial goals efficiently. The understanding and practice of supply chain management has become an important requirement to stay competitive in global competition and to increase profitability.

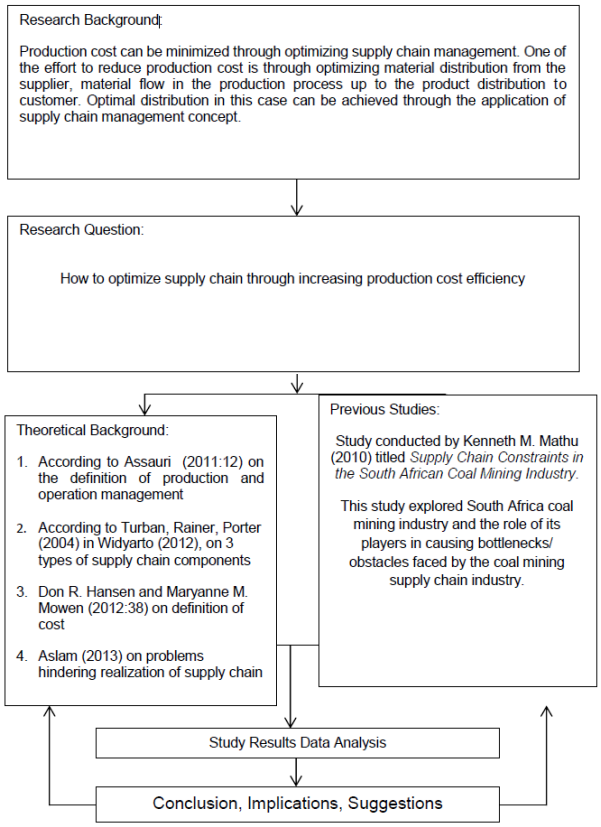
According to Bramanto (2010) in Dahoklory (2013) Supply Chain Management is a form of integrated approach that includes the whole process of material management, orientating to process to provide, produce, and distribute product to customers.

According to Jebarus (2001) in Widyarto (2012) Supply Chain Management is a further development of product distribution management to fulfill customers' needs.

According to Mulyadi (2011), there are four steps that can be applied to conduct efficient supply chain. First, to create a more specific chain within the business to establish a more integrated and interconnected pattern. Second, there needs to be managerial support from all level be it strategic or operational that gives support to planning, organizing, coordinating, conducting, and controlling processes. Third, building partnership in agreements on all chains in the form of partnership agreements between company and buyers that is focused on volume, distribution, lead time, and quality. Lastly, fourth, is to have an integrated information system in all fields involved in the supply chain system to support performance and productivity.

Based on *Peraturan Menteri Energi dan Sumber Daya Mineral Republik Indonesia No. 09 Tahun 2016 tentang Tata Cara Penyediaan dan Penetapan Harga Batubara untuk Pembangkit Listrik Mulut Tambang* (Energy and Mineral Resources Ministry of Indonesia Regulation No. 09 Year 2016 on Ways of Coal Provision and Price Determination for Coal Steam Fired Power Plant), production cost component of coal mining is determined in Article 9 Section 2.

RESEARCH CONCEPT FRAMEWORK



The analysis model is as follow:
PROBLEM → INEFFICIENCY → **SUPPLY CHAIN OPTIMIZATION** → EFFICIENCY

RESEARCH METHODOLOGY

This qualitative study is designed as exploratory study, with the aim to propose a supply chain optimization model to reduce production cost by using identified indicators.
The research location was in PT. PLN (Persero) Headquarter Building I Level 8, Jl. Trunojoyo Blok MI/135, Kebayoran Baru, by selecting a number of managers as key informants. They are the Production and Mining Manager, Transportation Manager, and Finance Manager of PT. PLN Batubara. The criteria for key informant was selected purposively based on the activities and their willingness to explore and articulate the activities and costs entailed in all the parts of the supply chain management.
The data obtained from the interview result with the manager was then processed to obtain accurate data. The steps done were: 1. Compare the data from observation and data from interview; 2. Compare what he/she said in public and in private; 3. Compare what was said by the people about the research situation and what the people normally say; 4. Compare situation and a person's perspective through various opinions and views from society of different classes; 5. Compare interview result with the content of related documents. From those five steps accurate data can be obtained as analysis source.

ANALYSIS RESULTS

The result of the study shows that PT. PLN Batubara was not free from obstacles. A number of interviewees admitted to difficulties relating to funding. The fund available was only enough to pay off supplier and partners debt. Maybe also to cover company's operational cost. Therefore, new transactions could not be conducted. Various problems that surfaced resulted in the need for supply chain management as the solution.

Based on the actual condition in the fields and that theory, thus supply chain management was a strategic choice for PT. PLN Batubara to overcome the problems it was facing. This was where PT. PLN Batubara needed to optimize supply chain management. What were the options?
This study help suggested that before selecting an option, there needed to be willingness from the directors to do optimization. Then the option is selected, through: conducting SWOT on strategic level, creating SOP, focusing on customer, target costing.
Study results also suggested a number of inefficiencies in each fields. The solution should also be based on each fields. But for it to be successful management needs to focus on improving company performance as to recover stakeholders' trust and recover employees' performances.
To make production cost efficient, interviewee suggested to, "First and foremost, we review the existing supply chain. We view it as a whole, from upstream to downstream supply chain. Then, we identify which ones are wasteful. Here we improve efficiency".

DIVISION	INEFFICIENCIES	SOLUTIONS
Production & Mining	a. Choosing coal mines that are not suited with the specifications needed by the end user (power plants), b. Due diligence process that is not accurate enough and not supported by adequate experts, c. Choosing coal mines that are located far from the end user loading dock, d. Coal stock piling in the mine stockpile that is not according to the shipping schedule, e. No integrated monitoring on coal stock in the harbor/ dock stockpile to the end of the loading process or when it's loaded on the barge, f. There are several mines waiting for cargo, so the barge docked on the harbor could take more but the coal cargo is not sufficient so that it resulted in additional cost due to barge demurrage.	- Stock balancing - Close monitoring of process from supplier to end user - CCTV installation - Database creation of requirements from all end users (power plants) - Form strong and reliable geologist team to construct complete and detailed database of the coal source whilst still referring to the requirement database from all power plants. - Form zones for all power plants and mines in the database. Hence, three mines in the nearest zone can cover each power plant in order to reduce transportation/ shipment cost as to minimize production cost. - Providing coal for PT. PLN Batubara must be done through pre-qualification process of each zone. - Due diligence process must be conducted on the coal mine database mentioned above - Tender/ auctioning in each zones with e-auction system on mines that passed pre-qualification and due diligence process.
Service	Service is done manually	Equipping information technology
Transportation	- Monthly barge rent (*time charter*) from PLN BB to several barge companies simultaneously resulting in significant fixed cost. - Overlapping shipping scheduling for coal loading from the purchase of coal through barge FOB, which often resulted in a number of barges not being used, and a number of barges charged with barge demurrage due to waiting cargo. - Barge queue during the loading on	- Consider using based on CIF in the loading dock of each power plant destinations. - Form supervising team to monitor production process up until loading process in all loading dock of the intended power plants. Add computerization to monitor all production process, loading and unloading. - The option of revising payment system. People in finance will

	the mines and unloading on the power plants. Especially lengthy queue during the unloading in power plants (7-12 days).	understand the most ideal payment method.

Several conclusions and suggestions were obtained from the analysis conducted by the researcher.

CONCLUSION

Conclusions from this study in general include how PT. PLN Batubara can do supply chain management optimization. However, the study result found a few suggestions from the interviewees on several measures to take before undergoing said optimization.

Before deciding on a method, one thing that needs to be made clear is on strategic level, which entails a strategy relating to decision that has long term impact on the company. From the strategic level, we can then proceed to the next steps according to the existing weaknesses.

Supply chain management optimization is done comprehensively, starting from upstream supply chain, internal supply chain management, down to downstream supply chain segment.

- Upstream supply chain: upstream supply chain can be improved through creating data base of all requirements from all end users (power plants) , then conduct due diligence process the aforementioned coal mine database. Then to ensure the coal mine database created is complete and detailed a team of geologist is formed whilst still referring to the database requirement from each power plants. From the database created, form zones for all power plants and mines recorded. Then, provision of coal for each zone should always go through tendering process through e-auction system. Aside from the geologist team, PT. PLN Batubara should also form a mine supervision team.
- Internal supply chain management: internal supply chain management can be improved through drafting back to back coal sales agreement contract between PT. PLN Batubara with all the auction winner candidates. Further strengthened by ensuring the contract pattern between PT. PLN Batubara with all the coal suppliers are based on CIF in the loading docks of each intended power plants. Payment from all power plants to PLN BB has to be liquidated maximum 30 days after the signing of Documents of Receipt of Goods by the power plants.
- Downstream supply chain: this chain has to be built optimistically that with the back up mine and management mentioned above, PT. PLN Batubara has to be optimistic to secure 20% of the coal supply to all existing power plants.

Then, while still referring to the Coal Price Reference (*Harga Batubara Acuan, HBA*), PT. PLN Batubara should be confident in taking higher bargaining stance.

SUGGESTION

Supply chain management optimization can be done properly if the management of PT. PLN Batubara is focused on improving company performance to recover stakeholders' trust and to recover employees' performance.

The researcher suggests board of directors (BOD) in the management of PT. PLN Batubara need to work together to build harmonic partnership relationship with all the stakeholders, so that when there is any problem it can be solved quickly, accurately and consistently in a harmonic situation.

Furthermore the managerial implications from this study that can be useful for similar companies, namely mining companies, are in terms of competing in the market. At least choosing to optimize supply chain management is a handy solution to solve company's problem. Only the methods would be different, according to the problems faced. The one common link is on the strategic level, in that management regulation can be a guide to apply said optimization.

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