

# The Effect of Supply Chain Management on Competitive Advantage and Operation Organization Performance at PT PLN (Persero)

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## ABSTRACT

The implementation of supply chain management (SCM) has high enough potential to increase the competitive advantage and organization performance since the competition not only among organization but also on supply chain. This research conceptualized and develops five SCM implementation (strategic supplier partnership, customer relationship, level of information sharing and postponement). Competitive advantage variable was measured based on 5 indicators such as price/cost, quality, delivery dependability, product innovation and time to market. Meanwhile, company's performance was measured based on two indicators such as operational performance and financial performance. The data collection for this research was conducted by distributing questionnaire. Analysis object of this research is PT. PLN (Persero) North Sumatera Region. There were 109 respondents as the sample which consists of Manager division, basic supervisor and operational staff. This sampling was done by using stratified random sampling. The analysis method used was structural equation modelling (SEM) with SmartPLS application. The result of this research showed that there was significant effect of SCM to competitive advantage and supply chain management to Organizational Performance. As the same thing also happened for competitive advantage to Organizational Performance.

**Keywords:** Supply chain management; Competitive advantage; Organizational Performance; Structural Equation Modeling.

## INTRODUCTION

Every company will make every effort to increase productivity, efficiency, fast, easy service, and continue to create a variety of new innovations to stay ahead and survive in the market. In addition to productivity and efficiency that need to be improved, companies must also understand and know what is needed by consumers. Supply chain management can have positive implications for the company's efforts to meet the demands of its consumers. Supply chain management can be useful for managing demand and supply by the company, so that operational activities carried out by the company can be more effective and efficient in accordance with the objectives of operations.

PT PERUSAHAAN LISTRIK NEGARA (PLN) is a state company that has the responsibility for ensuring the availability of electricity supply and its distribution as a whole up to the corners of the country. PT PLN operates four main functions, namely generation (generation), transmission (distribution), distribution (distribution), and Retail Sales / Retail Customer Service (Sales). Related to the benefits of supply chain management, the application then relates to several parties involved in the process of providing products to consumers. In terms of distribution often occurs mixed of regions where electrical energy is not aligned between one demand area because things occur due to supply centers (generators) not

in a position parallel to the load. This is a challenge for PT PLN (Persero) to improve the effectiveness of supply chain management, especially in the field of operating systems as core businesses.

The complexity of the process of supplying electricity is quite high, involving many organizations in the process line both internal and external parties. so that strategies are needed that must be implemented so that the company continues to survive and have a competitive market in between its current competitors, namely CPP (Captive Power) & IPP (Independent Power Producer) so that electrical energy can be distributed sustainable. The ability of PT. PLN in meeting the electricity needs of the Indonesian people in fact still contains many obstacles. For example in terms of the

national electrification ratio. Based on data from the Ministry of Energy and Mineral Resources (2019), it can be seen that basically the electrification ratio of Indonesia in recent years has increased. It's just that the increase also occurred in line with the increased need for electrical energy so that in the end the electrification ratio has not reached 100%.

**Table 1 Electrification Ratio**

Year	2014	2015	2016	2017	2018
Electrification Ratio (%)	84.35	88.3	91.2	95.5	97.5

Source : (ESDM, 2019)

Table 1 shows the Electrification Ratio of PT PLN (ESDM, 2019), with the PLN Electric Toll program, it is expected that electrification in 2020 will reach 100%.

**Table 2. Production Capacity of PLN and IPP / Private Generators**

Install and Production	2014	2015	2016	2017
Installed capacity PLN (MW)	37379,53	38314,23	41133,73	41720,96
Installed capacity IPP & Rent (GWh)	15685,97	17214	18522,57	19069
Production capacity PLN (MW)	175,29	176	167,80	184
Production capacity IPP & Rent (GWh)	53,26	58	64,80	81

Source : [www.pln.co.id](http://www.pln.co.id)

Whereas in Table 2 shows PT PLN (Persero) controls and operates a 41,720.96 MW power plant while IPP and Sewa control 19,069.02 MW. This shows that there is a gap installed where the electrical energy generated by the power plant operated by PT. PLN only reached 167.8 TWh (67.5%) with a target CF (Capacity Factor) of 62% while IPP production and leases amounted to 80.9 TWh (32.5%) with a target CF (Capacity Factor) 80%. Then PT.PLN must strive to increase production to dominate the market share of its competitors today.

In this study the SCM practice is proposed to be a multidimensional concept, including the downstream and upstream sides of the supply chain in the PT PLN business process, and empirically tested, using data collected from questionnaire respondents by direct survey especially in the core business section operation.

## Supply Chain Management

In the Supply Chain there are three types of flows that must be managed, first the flow of goods that flows from upstream to downstream, second is the flow of money and the like that flows from upstream to downstream, the third is the flow of information that can occur from upstream to downstream or information about inventory product, production capacity and shipping information (Pujawan, 2017). Supply Chain Management is an approach that is used to achieve a more efficient integration of various organizations from suppliers, manufactures, distributors, retailers, and customers. This means that goods are produced in the right amount, at the right time and at the right place in order to achieve the minimum overall cost of the system and also reach the desired service level (Levi, 2000).

Li et al., (2006) also stated that in an integrated supply chain there are the following processes:

### **a. Strategic Supplier Partnership**

The supplier partnership strategy is defined as a long-term relationship between the organization and its suppliers (Regina and Devie, 2015). Relationships with suppliers must be maintained so that the collaboration carried out will always be effective and become an important component of supply chain excellence. This is done to improve the strategy and operational capabilities of the supplier company in participating in the company which aims to achieve the expected goals (Stuart, 1997). This strategy is more focused on joint planning (mutual planning) and make efforts to solve joint problems between companies and suppliers (Gunasekaran, 2001). By implementing a strategy that partners with suppliers, it allows the company to work effectively with several suppliers who want to share responsibility for creating and succeeding a product.

### **b. Customer Relationship**

Kotler and Armstrong (2006), to win the current market, companies must be skilled not only in managing products, but also in managing relationships with customers to face competition. Building profitable customer relationships and achieving competitive advantage requires more value conveying and satisfaction to customers than is done with competitors. Customer relationship is a collection of practices aimed at managing customer complaints, building good long-term relationships with customers, and increasing customer satisfaction (Claycomb et al. 1999, Tan et al. 1998). With a good customer relationship, this allows a company to define its products to competitors, increase customer loyalty, and create value for customers.

### **c. Level of Information Sharing**

The level of information sharing refers to the extent to which important information is communicated to the company's business partners (Monczka RM, et al. 2008). Sharing information between business partners can be in the form of

strategic tactics, general market conditions, and information about customers. By exchanging information between members in the supply chain, this information can be used as a source of competitive advantage.

### **d. Quality of Information Sharing**

Quality of Information Sharing is the exchange of information between companies and trading partners on a regular, accurate, complete, adequate, and reliable basis / reliability.

### **e. Postponement**

Postponement (delay) is an indicator that can make the function of the supply chain downstream (consumers) to be effective. Procrastination can bring excellence, which allows the company to be flexible in the development and differentiation of products or services to meet customer needs (Li et al., 2006). Companies can make agreements with consumers regarding the delivery of goods or services.

### **Competitive Advantage**

Competitive advantage is the ability of a company to get greater profits from competitors engaged in the same industry (Porter, 1985). Competitive advantage is the advantage achieved by a company over its competitors by offering more value to consumers, either through lower prices for products or services or by providing additional benefits and better services (Attiany, 2014). According to Porter (1993), competitive advantage develops from the value that a company or organization can create to consumers that exceeds the production costs incurred by the organization. Competitive advantage can be measured by indicators, namely:

#### **a. Price**

For every company, the selling price of a product not only serves as a determinant of the amount of sales and profits, but also plays an important role in building competitive power with other companies. Therefore, in determining product prices, in addition to paying attention to the cost of product procurement, companies also should not ignore the

consequences of costs incurred by the procurement of something else to meet customer satisfaction. Besides that, companies are also required to pay attention to price competition factors prevailing in the market.

#### **b. Quality**

Quality is a factor contained in a product that causes the product to be valued according to what purpose the product is produced. In a manufacturing company, the term quality is defined as the factors contained in a product which results in the product being in accordance with the purpose for which the product is intended (Handoko, 2008). According to Gasperz (1998), quality is defined as the consistency of increase or improvement and decrease in variations in the characteristics of a product (goods or services) produced to meet the needs that have been specified in order to increase customer satisfaction.

#### **c. Delivery Dependability**

Delivery dependability is used to monitor suppliers' performance in terms of delivering the product required by customers on time, orders delivered complete and with the best quality possible (Harrison and Hoek, 2008). Delivery time can be a source of company competitive advantage, when the company is able to reduce the delivery time of consumer orders or reduce the time of service provision to consumers (Stonebrake and Leong, 1994).

#### **d. Product Innovation**

The wider the market competition, the tighter competition between companies where companies continue to emerge with new innovations. Products must remain innovative in order to survive in the market. Innovative products can increase the competitive advantage of new products themselves for the company. Innovation can be created through product development. Where product development is done by improving the product such as creating new functions or increasing the durability of a product. Innovative products are able to compete in the global era and still favor competitive advantages in order to remain

competitive in the global era and products can last long, not only seasonally (Cooper, 2000).

#### **e. Time to Market**

Time to market is the extent to which a company or organization is able to launch and introduce new products faster than its competitors (Regina and Devie, 2013). A company that is able to launch a new product rather than a competitor can attract the market's attention first as a product that does not yet exist everywhere is already available in a company, so it is likely to seize the market ahead of the competition. Companies must continue to plan strategies to be able to move faster and superior to create maximum competitive advantage.

### **Organizational Performance**

Organizational performance is a result produced by a company where the results can increase the value of the company itself. Every organization has objectives to be achieved determined by the standards that must be achieved. Organizational performance usually has a variety of assessments in a period with objectives. Assessments made on organizational performance can be seen by all things that can affect organizational performance and impact on profits, together in understanding problems and solutions to improve performance better, provide transparent information to facilitate communication in cooperation and improve improvements in performance is like improvement after evaluating the results of the performance appraisal.

According to Li, et al., (2006). Company performance can be measured by indicators:

#### **a. Operation Performance**

Non-financial performance is known as operational performance in which aspects are able to measure performance when the information available is related to opportunities that already exist but have not been realized financially (Cartoon, 2004). Operational performance can be measured using measurements such as market share,

new product launches, quality, marketing effectiveness, and customer satisfaction (Carton, 2004; Carton & Hofer, 2006; Venkatraman & Ramanujam, 1986)

### b. Financial Performance

The company's financial performance is basically needed as a tool to measure the company's financial health. The company's financial performance is used as a subjective measurement medium that

illustrates the effectiveness of the use of assets by a company in running its main business and increasing revenue.

### Conceptual framework

Based on a review of the literature as previously explained and in accordance with the problems that have been formulated, the conceptual framework of this study can be seen in Figure 1 below:

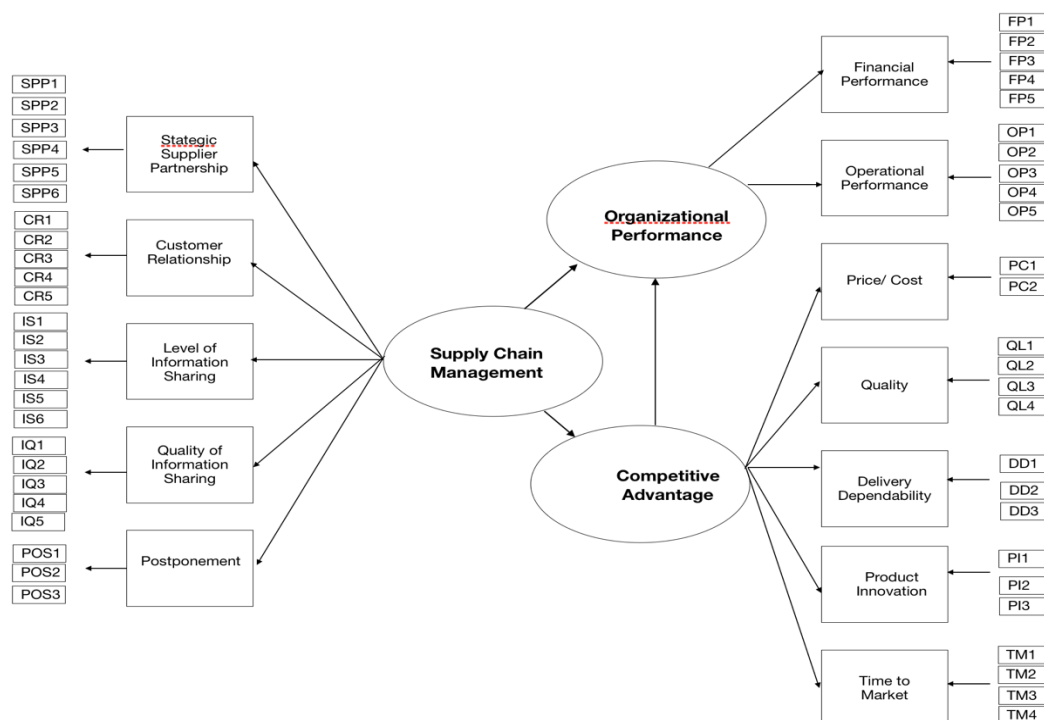


Figure 1. Conceptual Framework

### Hypothesis

1. Supply Chain Management has a positive and significant effect on Competitive Advantage at the Regional Office of PT PLN (Persero) Sumbagut
2. Supply Chain Management has a positive and significant effect on Organizational Performance at the Regional Office of PT PLN (Persero) Sumbagut
3. Competitive Advantage has a positive and significant effect on Organizational Performance at the Regional Office of PT PLN (Persero) Sumbagut

### RESEARCH METHOD

The research method used is Correlational Research, which is used to

study the extent to which variations in a factor are related (correlated) with one or more other factors based on the correlation coefficient. The population of this study, namely employees of PT PLN Persero Regional Northern Sumatra Operations Section numbered 150 people with a total sample of 109 people. The sampling technique using proportional stratified random sampling is used in order to obtain a representative sample by looking at the population of PT PLN employees who are stratified, which consists of several structural levels, heterogeneous (not the same type). Primary data obtained directly from the object of research, interviews and a list of questions distributed to respondents, processed in the form of data through

statistical tools provided to the Operations Officer of PT PLN (Persero) Regional Sumatra. The instrument used in this study was a questionnaire using a Likert scale. Testing in this study uses SEM (Structural Equation Modeling) with PLS (Partial Least Square).

## RESULT AND DISCUSSION

The description of latent variables and their manifest variables are as follows:

1. Exogenous latent variables of supply chain management (X) have five manifest variables (indicators) namely, strategic supplier partnership stated by X1; customer relationship declared by X2; level of information sharing stated

by X3; the quality of information sharing stated by X4; postponement stated by X5.

2. The exogenous latent variable competitive advantage (Y) has five manifest variables (indicators) namely, price / cost expressed by X1; the quality stated by X2; delivery dependability stated by X23; product innovation declared by X4; as well as the time to market stated by X5.
3. Endogenous variable endogenous organizational performance (Z) has 2 manifest variables (indicators) namely, financial performance expressed by Z1; operational performance stated by Z2.

**Table 3 Latent Variable Reliability Test Results**

Construct	Cronbach's Alpha	Composite Reliability	Keterangan
Supply Chain Management (X)	0,8800	0,9009	Reliable
Competive Advantage (Y)	0,9372	0,9453	Reliable
Organizational Performance (Z)	0,7998	0,8561	Reliable

Source: Research Results (2019)

Table 3 shows that all latent variables measured in this study have Cronbach's Alpha and Composite Reliability values greater than  $> 0.7$  so that it can be said that all latent variables are reliable. So it can be concluded that the construct has good reliability.

### R Square Testing

The R-Square value of the Competitive Advantage variable shows the R2 value of this study is 0.865 which means it has a value greater than 0.67. Then it can be said that the modeling formed is categorized as a good model. It is known that the R-Square (R2) value of the Operational Performance variable is 0.158 meaning that the OP variable is able to account for its effect of 15.87% while 84.12% is explained by the variable

**Table 4 R-Square Test Results**

	R Square
Competive Advantage (Y)	0,016330
Customer Relationship (CR)	0,009909
Delivery Dependability (DD)	0,739657
Financial Performance	0,723175
Level of Information Sharing (IS)	0,797394
Operational Performance	0,898637
Organizational Performance (Z)	0,158727
Postponement (POS)	0,157834
Price/ Cost	0,376944
Product Innovation (PI)	0,784284
Quality (QL)	0,725906
Quality Information Sharing (IQ)	0,603980
Strategic Supplier Partnership (SPP)	0,498649
Supply Chain Management (Manajemen Rantai Pasok) (X)	
Time to Market ( TM )	0,704408

Source: Research Results (2019)

### Test of Significance

It is known that the T-table value for the confidence level of 95% ( $\alpha$  of 5%) and the degree of freedom (df) =  $n-2 = 85 - 2 = 83$  is 1.99 while for  $\alpha$  of 1% is 2.36 . Hypothesis testing for each of the latent variable relationships is shown as follows:

**Table 5 Results of Calculation of Bootstrapping Research Data**

	Original Sample Estimate (O)	Sample Mean (M)	Standard Deviation (STD)	T Statistic (IO, STDEVI)	P Value
The Effect Of Supply Chain Management (X) On Competitive Advantage (Y)	0,1278	0,1231	0,0447	2,85**	0,0447
The Effect Of Competitive Advantage (Y) On Organizational Performance (Z)	0,3086	0,3065	0,0292	10,57**	0,0292
The Effect Of Supply Chain Management (X) On Organizational Performance (Z)	0,2157	0,2195	0,0265	8,13**	0,0265

Source: Research Results (2019)

### Hypothesis Testing Variables Effects of Supply Chain Management (X) on Competitive Advantage Variables (Y)

Based on the results of the output table calculation results of bootstrapping research data in the column T statistics for the supply chain management variable (X) against the competitive advantage variable (Y) of  $2.85 > T\text{-table}$  (1.995 for  $\alpha$  of 5% and 2.36 for  $\alpha$  of 1%). The original sample estimate value shows a positive value of 0.1278 which indicates that the direction of the relationship of the supply chain management variable (X) to the variable competitive advantage (Y) is positive. Thus H1 was accepted in the study. That is, in this study the supply chain management (X) latent variable with its indicators influences the latent competitive advantage (Y) variable with its indicators significantly.

### Hypothesis Testing Competitive Advantage (X2) Variables on Organizational Performance Variables (Z)

Based on the results of the output table calculation results bootstrapping research data in the column T statistics for the variable competitive advantage (Y) against organizational performance variables (Z) of  $10.57 > T\text{-table}$  (1.995 for  $\alpha$  by 5% and 2.36 for  $\alpha$  by 1 %). The original sample estimate value shows a positive value of 0.3086 which indicates that the direction of the relationship of the variable competitive advantage (Y) to organizational performance variables (Z) is positive. Thus H2 was accepted in the study. That is, in this study the latent variable competitive advantage (Y) with its indicators influences the latent variable of organizational

performance (Z) with its indicators significantly.

### Hypothesis Testing Supply Chain Management (X) Variables on Organizational Performance Process Variables (Z)

Based on the results of the output table calculation results bootstrapping research data in the column T statistics for the supply chain management variable (X) to organizational performance variable (Z) of  $8.13 > T\text{-table}$  (1.995 for  $\alpha$  by 5% and 2.36 for  $\alpha$  by 1%). The original sample estimate value shows a positive value of 0.2157 which indicates that the direction of the supply chain management variable (X) to the organizational performance variable (Z) is positive. Thus H3 in the study was accepted. That is, in this study the supply chain management (X) latent variable with its indicators influences the Organizational Performance (Z) latent variable with its indicators significantly.

## CONCLUSION

From the results of the presentation and discussion of the data above, the conclusions from the results of the study are:

1. Based on the results of the first hypothesis testing it can be concluded that the practice of Supply Chain Management has a positive and significant effect on Competitive Advantage at PT. PLN (Persero) Regional of Northern Sumatra
2. Based on the results of the second hypothesis testing it can be concluded that the practice of Supply Chain Management has a positive and

significant effect on Organizational Performance at PT. PLN (Persero) Regional of Northern Sumatra

3. Based on the results of testing the third hypothesis it can be concluded that the practice of Competitive Advantage has a positive and significant effect on Organizational Performance at PT. PLN (Persero) Regional of Northern Sumatra

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