



Supply Chain Strategy to Support the Independence of the Defense Industry

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Abstract

The supply chain is a unified process and production activity starting from raw materials obtained from suppliers, the process of adding value that converts raw materials into finished goods, and the process of storing an inventory of goods until the process of sending finished goods to consumers. In the defense industry, the supply chain cannot be separated because of its role in regulating how defense products work, from raw materials to finished materials. The method of this journal is a literature review which is then processed using system thinking and SWOT analysis to solve the problem of the weak domestic Defense Industry supply chain. The results of the analysis of the literature review state that the supply chain has a vital role in the development and independence of the domestic defense industry. Problems with the domestic logistics system have contributed greatly to the weak domestic defense industry supply chain. In addition, dependence on imported raw materials for production also creates a potential threat that weakens the flow of the supply chain. Raw materials that are still imported are prone to embargoes so if that happens, the production flow of defense products will stop completely due to the absence of raw materials. Based on this study, good and integrated global supply chain management is recommended to be applied to the defense industry to overcome the weakness of the defense industry's supply chain.

Keywords: *Supply Chain Management; Defense Industry; Logistics System; SWOT (Strength; Weakness; Opportunity; Threat)*

Introduction

The global supply chain forum defines supply chain as the integration of business processes from end users to initial suppliers to provide products, services, and information that add value to customers and other related parties (Croxtton et al., 2001). The supply chain is an organizational or company system that plays a role in carrying out various activities, ranging from information, costs, and other resources that are interrelated in the movement of a product or service from suppliers to end users or consumers. The defense industry is a strategic industry determined by the government to produce part or all of it to

produce defense and security equipment, or maintenance services to support the strategic interests of national defense and security. The defense industry consists of BUMN and BUMS independently or groups that have been determined by the government (Undang-undang No. 16 Tahun 2012). In the defense industry, the supply chain regulates how defense products travel from raw materials to finished products. Seeing the relationship from upstream to downstream, in practice, the supply chain has a considerable influence for companies to consumers (Yusuf et al, 2022).

Some of the supply chain problems in Indonesia are that there is no optimal support from the logistics system for the domestic defense industry. Logistics is part of the supply chain. The lack of support for the defense industry's logistics system can be seen from the quality of the supporting infrastructure, namely the quality of the roads that are not very good. With regard to infrastructure, in the implementation of the transportation system, there are still many transaction costs to illegal levies that are detrimental to the parties concerned. The impact of the inadequate existing logistics system is the high national logistics costs, which reach 27% of the Gross Domestic Product (GDP) (Wirabrata, 2013). The consequence of the high cost of national logistics is that it will cost a lot in the production of defense equipment to its delivery. In addition, the logistics service is also bad. This condition is due to conventional logistics infrastructures, such as roads, ports, and intermodal links. Connectivity between one location and another has not been established, loading and unloading costs at the port are high, and access roads from and to the port are often jammed and never resolved (BKPERDAG, 2013). As a result, it is very difficult for freight companies to optimize their vehicle turnover. Especially in the defense industry, there are several items that are large in size so it will be difficult to move goods. As a result, currently, the performance of Indonesia's national logistics sector based on the Logistics Performance Index is ranked 75th out of 155 countries.

Another problem is raw materials which often depend on imported raw materials from abroad. This dependence is prone to causing potential threats. The embargo is a pretty serious threat in this regard. If an embargo occurs, as happened in 1998, Indonesia will have difficulty in producing and meeting domestic defense needs. Because supplies from abroad were stopped. It will harm and weaken the Indonesian defense industry and defense system (Siahaan, 2019). For this reason, the basic problems that result in weak supply chains in Indonesia need strategic decisions to overcome them.

A well-managed supply chain can produce cheap, quality and timely products so that target markets can be met and generate profits for the company. According to Dumitrascu et al. (2020) in a supply chain network, there are three types of flows that must be managed. The first is the flow of goods flowing from upstream to downstream. For example, raw materials sent from suppliers to factories. After the products have been produced, they are sent to the distributor, then to the retailer or retailer, then to the end user. Second, the flow of money and the like that flows from downstream to upstream. The third is the flow of information that can occur from upstream to downstream or vice versa. For example, distributors and factories often need information about product inventory that still exists in each supermarket. Companies must share information like this so that interested parties can monitor for more accurate planning purposes. According to Dhamija et al. (2020) Supply chain management has become a strategy used by companies. Because the existence of an integrated relationship between the supply chain and the company can minimize the total costs consisting of raw material costs, transportation costs, facility costs, production costs, inventory costs, and so on.

Research Method

The research method is qualitative research with data sources from a literature review which is then processed using system thinking and SWOT analysis to solve the problem of the weak domestic

defense industry supply chain. The method used in order to acquire thorough knowledge, strategy involves looking at the phenomena causing the problem and analyzing its structure to be stated in a straightforward system model. A SWOT analysis was also carried out.

Senge (2013) in their book *The Fifth Discipline: The Art and Practice of the Learning Organization* describe that "Systems thinking is a discipline for seeing wholeness. It's a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static 'snapshots'. It is a general set of principles, it is also a specific set of tools and techniques."

Using a SWOT analysis, a corporation can discover the different existing components that go into creating its own corporate strategy. The study was done logically, with features of strengths and possibilities that were maximized as well as aspects of weaknesses and threats that were simultaneously eliminated (Endarwita, 2021).

The objective of the SWOT analysis employed in this analysis is to be able to identify key elements of current threats, opportunities, weaknesses, and strengths. SWOT analysis is used to map the advantages, disadvantages, opportunities, and threats of current events. Finally, offer suggestions for how to address the problem's phenomena.

Result and Discussion

When demanded from national defense. The following archetype diagram in figure 1, explains that starting from the presence of threats with various motives that attack the national defense, it is necessary to formulate a national defense strategy.

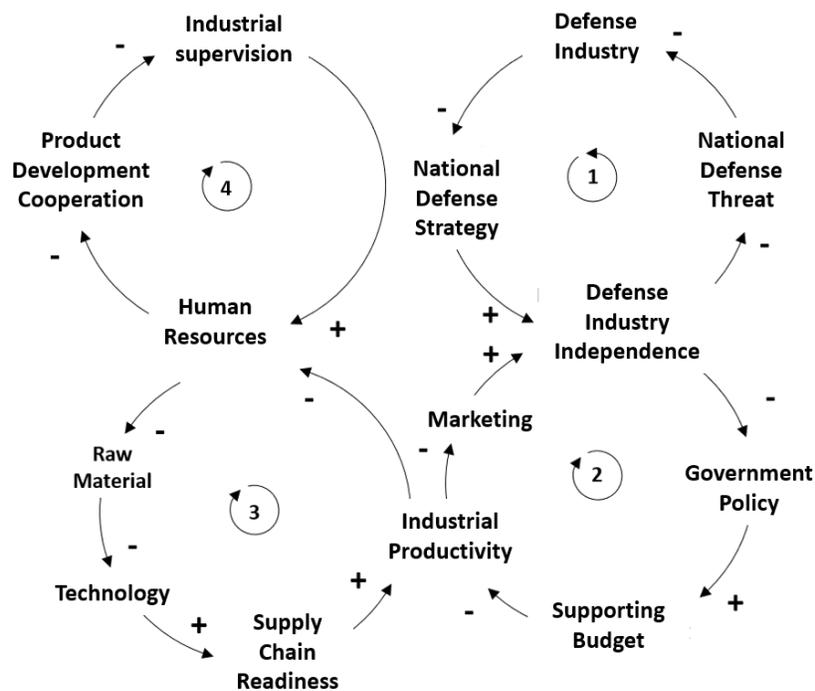


Figure 1. Causal loop diagram defense industry independence

The strategy is to realize the independence of the defense industry. The independence of the defense industry requires support from government policies in the form of a budget to support the independence of the defense industry. In addition, government policies to optimize private involvement in the defense industry supply chain will also be able to support the development of the national defense industry (Dwiguna et al., 2022). With this budget and optimizing private involvement is able to influence industrial and marketing products which will add strength to realize the independence of the defense industry. Meanwhile, company productivity requires human resources, raw materials, and technology, all three of which will increase supply chain readiness, which is a process from upstream to downstream. And supply chain readiness will certainly increase industrial productivity. The next circle is human resources. The actual need for human resources is still lacking. This can be seen from the number of incompetent human resources. So human resources require development cooperation for production purposes. This collaboration includes research and development. Institutions that are competent in research are required to take part in this development collaboration, not forgetting to involve academics from universities whose knowledge will be able to contribute to development in many ways. In addition, there is a need for the supervision in industrial activities by experts. It is hoped that this supervision will be able to direct human resources and good development.

Overcoming supply chain problems and improving them, Indonesia needs to contribute and speak a lot in the global supply chain context.

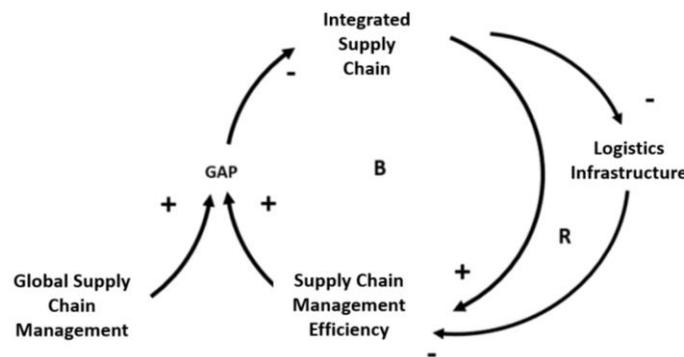


Figure 2. Archetype Fixed That Fail Global Supply Chain Management Diagram

Figure 2 above describes, in order to push Indonesia into global supply, there is a gap, namely the domestic supply chain system that has not been integrated. For this reason, it is necessary to have an integrated domestic supply chain system to increase supply chain efficiency. So that the goods produced will be of value at a cheaper price and good timeliness. However, in its application, the integrated system in the supply chain has a problem, namely the poor domestic logistics infrastructure. This results in moving the product which takes a long time and the cost of moving the product is expensive. So that these constraints reduce the efficiency of the expected supply chain management.

In analyzing the problem system, an analysis is carried out using SWOT. The analysis contains the strengths, weaknesses, opportunities and threats of the problems that have been unraveled from the previous system thinking. The SWOT analysis of the problem system is shown in Table 1 below.

Table 1. Problem System SWOT Analysis

Strength
The status of a BUMN for Strategic Industries can be used to support an integrated supply chain system
Indonesia's geostrategic position supports easier rotation of defense products
Have BUMN and BUMS defense industry
Have qualified natural resources
Weakness
Manufacturing process support technology that is less supportive
The cost of technology investment and synchronization of manufacturing processes take a long time and are expensive
Poor domestic logistics infrastructure
The development of regulations that change frequently in a short period of time
Opportunities
Government support through policies that encourage the independence of the defense industry that is able to attract attention and open competitive opportunities for companies producing the raw materials needed to facilitate the supply chain flow
Indonesia's geostrategic position can be utilized to contribute to the global supply chain circle
Collaboration between business entities to overcome GAP in the form of insufficient funding for raw materials because they rely on imports of raw materials
Adequate with the resources owned by the state which can be utilized whenever there is a demand for the manufacture of raw materials that support the country's supply chain
Threats
Manufacturing processes and skilled personnel that require adjustments
Long time and is expensive for supply chain initiation
Imported raw materials are prone to embargoes
Competitors who have a stable manufacturing system that has been proven to produce products that meet the company's needs

In compiling the solution structure, the weighting of each SWOT column is carried out. So that from the weighting can be determined the position of the quadrant used for the calculation of strategy determination. The weighting obtained is as Table 2. follows.

Table 2. Weighting Analysis IFAS and EFAS

IFAS	Strength	Weight	Rating	W x R
	The status of a BUMN for Strategic Industries can be used to support an integrated supply chain system	0.135	3	0.405
	Indonesia's geostrategic position supports easier rotation of defense products	0.133	3	0.399
	Have BUMN and BUMS defense industry	0.138	3	0.414
	Have qualified natural resources	0.12	3	0.36
	Weakness			
	Manufacturing process support technology that is less supportive	0.14	2	0.28
	The cost of technology investment and synchronization of manufacturing processes take a long time and are expensive	0.13	2	0.26
	Poor domestic logistics infrastructure	0.085	2	0.17
	The development of regulations that change frequently in a short period of time	0.117	2	0.234
EFAS	Opportunities	Weight	Rating	W x R
	Government support through policies that encourage the independence of the defense industry that is able to attract attention and open competitive opportunities for companies producing the raw materials needed to facilitate the supply chain flow	0.133	2	0.266
	Indonesia's geostrategic position can be utilized to contribute to the global supply chain circle	0.133	2	0.266
	Collaboration between business entities to overcome GAP in the form of insufficient funding for raw materials because they rely on imports of raw materials	0.11	2	0.22
	Adequate with the resources owned by the state which can be utilized whenever there is a demand for the manufacture of raw materials that support the country's supply chain	0.115	2	0.23
	Threats			
	Manufacturing processes and skilled personnel that require adjustments	0.25	1	0.25
	Long time and is expensive for supply chain initiation	0.14	1	0.14
	Imported raw materials are prone to embargoes	0.3	1	0.3
	Competitors who have a stable manufacturing system that has been proven to produce products that meet the company's needs	0.43	1	0.43

From the weighting results obtained, then a SWOT matrix is made as shown in Table 3 as follows.

Table 3. SWOT Matrix

EFAS/IFAS	Strength	Weakness
Opportunity	SO = 1.58 + 0.98 = 2.56	WO = 0.944 + 0.98 = 1.926
Threat	ST = 1.58 + 1.12 = 2.698	WT = 0.944 + 1.12 = 2.064

So that from the matrix it can be determined the position of the quadrants, namely as shown in Figure 3. as follows.

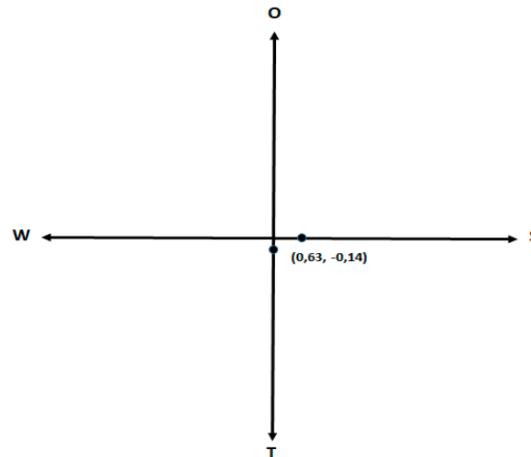


Figure 3. Quadrant Positioning

So that the results of the quadrants that have been determined produce a strategy that can be implemented, namely ST or Strength Threat, described in Table 4 below.

Table 4. Results of Strength and Threat Strategies

SWOT Analysis		Strength	
		1	The status of a BUMN for Strategic Industries can be used to support an integrated supply chain system
2	Indonesia's geostrategic position supports easier rotation of defense products		
3	Have BUMN and BUMS defense industry		
4	Have qualified natural resources		
Threats		Strength & Threat Strategy	
1	Manufacturing processes and skilled personnel that require adjustments	1	Conduct an integrated supply chain study with the facilities and supply chain used so that simulations and studies can be carried out for budget adjustments and determining demand cost forecasting (S1, T1, T2)
2	Long time and is expensive for supply chain initiation	2	Carry out line balancing plans in the production process by taking into account machine capacity and production floor area as well as calculating plans and forecasting of the company's production processes both short and long term to adjust personnel/employee allocations and budget plans. (S1,S4,T1,T2)
3	Imported raw materials are prone to embargoes	3	Dissemination of raw material product quality standards to BUMS so that they can be adjusted to the internal development process to achieve quality according to specified standards (S1, S3, S4, T1, T3, T4)
4	Competitors who have a stable manufacturing system that has been proven to produce products that meet the company's needs	4	Determining the location of logistics points to increase flow efficiency in the global supply chain by taking advantage of Indonesia's geostrategic position (S2, S4, T2)

So the recommendation from the results of the analysis is that the Ministry of Defense needs to carry out the mandate of UU Cipta Kerja No. 52 to issue regulations regarding defense sector business

fields that are open to private and foreign investment. This needs to be done in order to reduce the burden on the state as an effort to collect capital outside the APBN. In addition, the right foreign investment can pave the way for the national defense industry to become part of global supply chains. With so much capital owned, it is able to support the improvement of the domestic logistics system. There is also a need for collaboration with the ministry related to transportation and development so that the problem of facilities and infrastructure can be handled properly for the benefit of the domestic logistics system. Another policy recommendation is that the Ministry of Defense needs to map appropriate technology for military transformation purposes and determine maintenance and development priorities. But on record not to buy completely, meaning that there is a need for investment for own production. That way it can have an impact on the independence of the defense industry and supply chain management arrangements can be regulated and properly managed to produce valued and timely defense products (Laboratorium Indonesia, 2021).

Conclusion

The cause of the weak supply chain in Indonesia is a supply chain problem, namely there is no optimal support from the logistics system for the domestic defense industry. The domestic logistics system is considered poor, from the condition of the existing roads to the service. In the implementation of the transportation system, there are still many transaction costs to illegal levies that are detrimental to the parties concerned. The impact of the inadequate existing logistics system is the high national logistics costs, which reach 27% of the Gross Domestic Product (GDP). The consequence of the high cost of national logistics is that it will cost a lot in the production of defense equipment to its delivery. Apart from that, raw materials still depend on imported raw materials, so they are prone to embargoes. This weakens the supply chain because the circulation relies on foreign industries.

The structure of the solution can be carried out with an integrated supply chain study with the facilities and supply chain used so that simulations and studies can be carried out for budget adjustments and determining demand cost forecasting with assistance from the government in planning an efficient logistics system. In addition, it is also necessary to socialize raw material product quality standards to BUMS so that they can be adjusted to the internal development process to achieve quality according to specified standards and reduce dependence on raw material products from abroad. The third solution is to carry out a line balancing plan in the production process by taking into account machine capacity and production floor area as well as calculating plans and forecasting for the company's production process both short and long term to adjust personnel/employee allocations and budget plans. And the fourth is determining the location of logistics points to increase flow efficiency in the global supply chain by taking advantage of Indonesia's geostrategic position.

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