

IMPLEMENTATION OF GOVERNMENTAL LOGISTICS POLICIES TO ENHANCE COMPETITIVENESS IN THAILAND'S INDUSTRIAL SECTOR

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Abstract

Thailand industrial sector is now facing intense logistics cost disadvantages, amounted to about 14.3% GDP. Cost control from supply chain and logistics management is the main priority for every companies. The Bureau of Logistics, Department of Primary Industrial and Mines, one of the major governmental offices who are responsible for National logistics cost reduction has introduced a number of policies to cut down industrial logistics cost. With significant and regular funding to focused industries, tangible results and achievements have been realized and demonstrated.

Purpose: This research paper aims to highlight the outcomes from the “Northern Thailand Logistics Improvement Project”, which was supported by the Bureau of Logistics in 2012. This paper provides insight into the improvement of the logistics performance obtained from applying various logistics techniques to the six highest exporter industries, consisting of (i) food, (ii) petroleum and plastic, (iii) electrical and electronics, (iv) auto parts, (v) garment and textiles, and (vi) natural rubber industries.

Design/methodology/approach: Twenty-five selected companies from Northern Thailand have been evaluated using the industrial standard, Logistics Scorecard. Then, two improvement sub-projects are introduced to each company considering from the revealed weaknesses. Appropriate logistics and supply chain management tools are subsequently proposed to the company s' improvement team to resolve identified problems.

Findings: It has been shown that the average score from the Logistics Scorecard was increased from 2.57 to 3.15, where the highest increasing score belonged to the electrical and electronics industry (42.5% improvement). This resulted in a decline of the logistics cost in selected companies (Northern Thailand area) by more than 15% or in total about 2 million USD. Potentially, these players can expect to reduce the logistically related costs by more than 14 million USD within five years.

Research limitations/ implications: The findings here are based from only 25 companies in the Northern Thailand. The Bureau of Logistics involved with more than 350 companies countrywide in 2012. A great number of companies are expected to benefit from similar kind of projects in the near future to come.

Originality/ value: Similar approach can be extended to potential companies in different area or industrial sector in order to reduce companies' logistics cost or enhance their competitiveness.

Keywords: Logistics Policy Implementation, Productivity improvement, Logistics Scorecard

Paper type: Logistics Development Policy

Introduction

Thailand has been ranked highly worldwide as a major exporter in many industries, such as electronics, automobile or agricultural products. With potentially bright outlook, Thailand has been blessed with great opportunities to obtain increasing foreign direct investments from all over the World. However, Thailand's industry is currently facing intense cost competition, such as high labour and high transportation costs, which will affect the competitiveness of each industry. According to the statistics reported by the Siam Commercial Bank's Economic Intelligence Center (EIC), Singapore was ranked

first in having the lowest logistics costs per GDP, followed by Malaysia and Thailand. The Thai logistics costs per GDP was 14.3%, consisting of 1.3% of GDP on management, 5.9% of GDP on inventory, and 7.1% of GDP on transportation costs. For these reasons, the supply chain and logistics management is clearly the main issue for every companies.

The Department of Primary Industries and Mines (DPIM) is one of the Royal Thai governmental arms, responsible for improving supply chain and logistics of the country's industry. DPIM is well aware of the logistics cost situation in Thailand. The logistics policies have been established and put in place to increase the performance and decrease the cost, leading to continually improved competitiveness of Thailand. The logistics policy consist mainly of three strategies; to support human resources of the logistics management for each industry, to establish the logistics integration between each company, and to support and provide necessary facilities to increase the efficiency of the supply chain and logistics for the targeted industry. In order to decrease the logistics cost, DPIM took a serious action on making an improvement plan which can be applied to the industry. This action plan supported the strategy of logistics cost reduction plan which intended to decrease the logistics cost per GDP from 14.3% to 12.0% by 2016.

In this work, a showcase in Northern Thailand is highlighted. The logistics policy implementation and improvement are reviewed. From the detail of logistics policy in Thailand, the research methodology is put forward. The main results are analyzed, Finally, the main conclusions and recommendation are given.

Literature Review

Supply chain and logistics management policy in Thailand offers crucial solutions to increase the performance and efficiency of each company. There are several literatures describing in detail how to improve and implement those supply chain and logistics techniques to a company. For this research, two topics of literature review have been studied. They are logistics policy implementation on other countries and logistics efficiency improvement.

Logistics policy implementation in other countries

Over the last 30 years, many countries rapidly constructed and improved transport system and logistics infrastructure, which has successfully contributed to the economic growth and development. Singapore was ranked top on supply chain and logistics management worldwide. She has built her own strength as a transportation and distribution hub, becoming one of the leading logistics center. (Bhatnager et al., 1999). The long term policy on logistics improvement of Singapore consists of developing technical know-how, developing manpower, development infrastructure and enhancing the business process. Singapore also focuses on tracking and monitoring the trends and changes in the logistics industry, not only in Singapore but also in the emerging markets and economies in the Pacific rim (Sum and Teo, 2001). China is also a major player on logistics management. China logistics performance is among of the highest improved countries. China has reached the point of the most attractive destination for the foreign entrepreneurs. One reason is the low cost of manufacturing and vast domestic market potential (Einhorn, 2001). The key success of China is supply chain and logistics improvement such as, the improvement of transportation network, high-tech warehouse structure and knowledgeable skill labor force. For further improvement, China has been applying several logistics strategies and policies for both government and private organizations (Goh and Ling, 2003). It has been clearly demonstrated that logistics improvement would be the best way to increase the potential for each industry and gain more competitiveness.

Logistics performance improvement

There are several techniques and tools which can be applied to improve the logistics performance.

(i) Lean management is defined as principle of loss elimination which focuses on the input, process and output to increase the efficiency of each activity. The most important tool supporting the concept of lean management is value stream mapping (VSM). It can be used as a process diagnosis to define the value of activities in the process. Furthermore, VSM is accepted by every companies to be the best practice for analyzing and improving the process (Tapping, 2002). Based on VSM, each process can be grouped into 3 categories which consist of non-value added (NVA), necessary but non-value added (NNVA), and value added (VA). The NVA is the activity which does not increase the value to process and also can be eliminated from the VSM to increase the efficiency of the process

(ii) Inventory and warehouse management is one of the most important activity of the supply chain and logistics management because this activity supports the production process and the customer relation for rapidly response to the customer demand. The inventory management has the highest cost, compared with other activities. It could directly affect the profit of the company and the customer satisfaction (Baker and Canessa, 2009). The inventory management focuses on 4 main activities, consisting of receive, storage, pick up and deliver. To manage the inventory, several activities are taken into account, e.g. location selection, inventory sizing, inventory plant and layout design, warehouse management system, location control, delivery and record and data (Gu et.al., 2011). There have been many research works about inventory management. Chan and Chan (2002) applied inventory management and Pareto chart to prioritize the value of the material. Plant and layout technique was also applied to rearrange material storage by considering the inventory constraint such as type of material, inventory turnover or the space requirement for each material. Petersen et al. (2002) applied inventory management to improve order-picking performance through the implementation of class-base storage. Materials were classified by considering the effect of the number of storage classes, the partition of storage classes and the storage implementation strategy applied in the warehouse. They were grouped into 3 different types, consisting of class base storage, random storage and volume bas storage. It was shown that the class base storage can provide the significantly reduced time of order-picking. The inventory management is the most important and widely used technique to increase the supply chain and logistics performance.

Logistics policy in Thailand

Supply chain and logistics management is a serious issue, not only for Thai companies but also the Thai government. Strategies and policies have been established to increase the efficiency of the Thai supply chain and logistics management. This six perspective strategies consist of logistics and

<p>Objective</p> <ol style="list-style-type: none"> 1. Decrease Logistics cost per GDP to 12% in 2016 2. Increase Logistics performance to 4 out of 5 by using Logistics performance Index: LPI to evaluate the score. 3. Increase the economy value of logistics industry by 10% per year. 4. Increase the value of target industry by 10% per year
<p>Vision</p> <p>Thailand as the ASEAN Logistics Connecting Gateway to Global Markets</p>
<p>Goals</p> <ol style="list-style-type: none"> 1. To increase the efficiency and standard of logistics service in term of cost efficiency to increase the responsiveness reliability and security for customer 2. To gain more competition advantages on each industry and increase the country's economy value

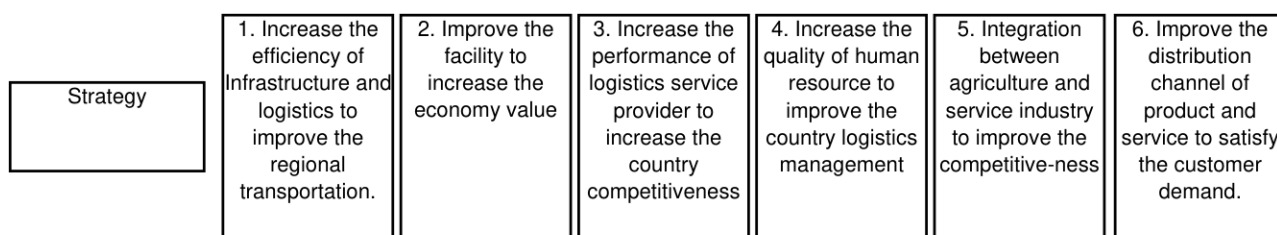


Figure 1: Thai logistics policy improvement 2012-2016

Regarding the research of Office of the National Economic and Social Development Board, transport cost still is the highest proportion of logistics cost structure corresponding to 49.8%, following by inventory cost and logistics management cost at 41.1% and 9.1%, respectively. Around 200 companies in Thailand were involved in data collection for evaluation of the logistics performance index (LPI). Result of the cost indicator showed that the electric and electronics industry has the highest inventory cost, while the automotive industry and plastic industry was ranked highest on transport cost. The result of time indicator showed that the automotive industry was the best in order management, while the food industry was the best in inventory management. For the reliability

indicator, the electric and electronics industry and the food industry gained the highest score of punctual shipment, while the plastic industry was the best in forecasting accuracy, shown in Figure 2.

From the data, each industry should improve their logistics performance to increase the competitiveness. DPIM is one of the governmental organizations who concerns with and focuses on logistics improvement, especially the inbound logistics. Along with the policy of Ministry of Industry (to decrease the inventory cost per sale by 15%) and the policy of Thai logistics improvement, the Northern Thailand project focuses on the logistics improvement in targeted industry to decrease the logistics cost per GDP.

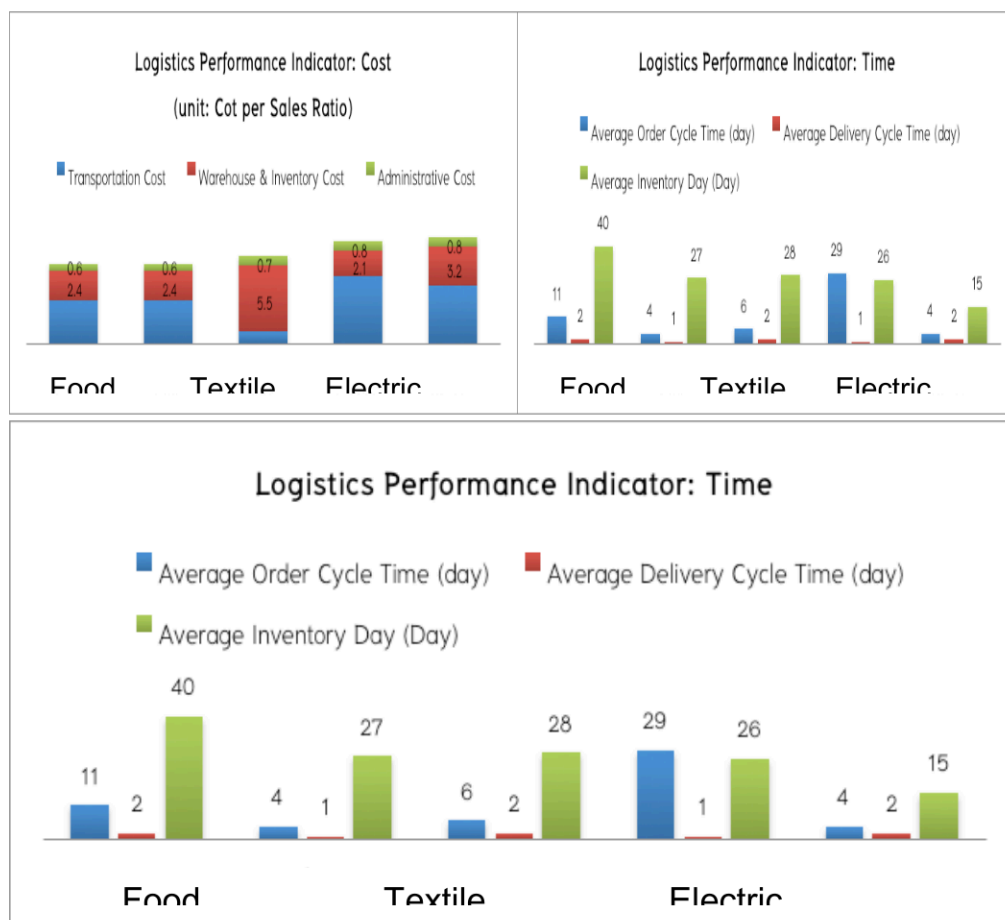


Figure 2: Thailand Logistics Performance Index (LPI)

Research Methodology

This research is about improving the supply chain and logistics management on the target industries. The target industries consist of five members namely, food industry, electric and electronics industry, automotive and automotive part industry, textile industry and petroleum and plastic industry. The methodology has four phases. The first one is preliminary investigation and company selection, following by the diagnosis, consultation, and dissemination, respectively, shown in Figure 3.

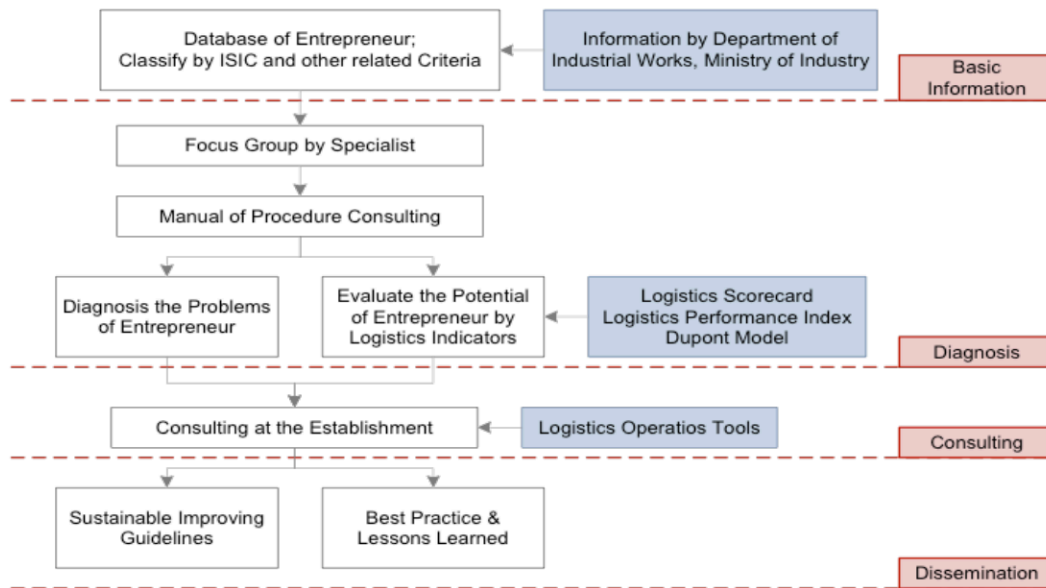


Figure 3. The research methodology

Preliminary investigation and company selection

The first phase of this research is to investigate and select the entrepreneur or target companies. The information about the revenue of each industry, the amount of investment and other primary data have been searched. This data was used to create the database of company, classified using the ISIC code and other related criteria to select the target industry. 25 companies were chosen, 15 from food companies, 2 from petroleum and plastic companies, 3 from electric and electronics companies, 2 from automotive and automotive part companies and 3 from textile companies.

Diagnosis

After the company selection, each company was evaluated for the current logistics performance. The Logistics Scorecard technique was used. After company diagnosis, the result showed that the average score was 2.84 out of 5. The highest average score belongs to the efficiency of lead time management indicator which has a score 3.44, followed by the customer satisfaction management indicator which has a score 3.14. Additionally, the industrial engineering techniques were also conducted, such as Fish Bone Diagram, Value Stream Mapping (VSM), Logistics Performance Index, and Dupont Models, to identify main causes of the problem. According to the result, the expert and company owner will discuss and decide which project would be the main focus. Two different projects were selected and both of them focus on the supply chain and logistics improvement.

Consultation

In this phase, the project will be implemented to the company. The consultation provided by the expert was separated into several times during the year, and covered all necessary topics such as the business plan, supply chain and logistics management, and industrial engineering tools. The outcome will be reported to the owner to show the detail about the company strengths and weaknesses. Appropriate techniques and tools were proposed and implemented to the company to develop existing

process. Several types of project were extended specially for each company such as the plant and layout design improvement, the inventory improvement or process improvement by optimization technique. After the implementation, the data will be collected to compare between the current and the improved processes.

Dissemination

After implementation, the data was collected and analyzed for the comparison. According to the result, the average score measured by Logistics Scorecard has increased by 22.6%. The best two improved companies were selected to be the role model for other companies. Conclusion of each company has been made and reported as the best practice improvement.

Results and Discussion

The supply chain and logistics improvement project was implemented in 25 companies. The result of this research consists of the logistics performance improvement and the logistics cost reduction.

Logistics performance improvement

The logistics performance improvement was evaluated by Logistics Scorecard in five criteria and 23 sub criteria. The category of five criteria includes Corporate strategy & inter-organizational alignment, Planning and execution capability, Logistics Performance, IT implementation and management and, Collaboration with external business partners. The result after improvement showed that the average score of every criteria was 3.15 (22.6% increase compared with the previous score 2.57). The highest score was 3.7, belonged to sub-criteria of "System for measurement and improvement of customer satisfaction". Furthermore, the score can be categorized by type of industry.

(i) Food Industry: The evaluation result of logistics performance in the food industry is shown in Figure 4a. The average score after improvement was 3.16 (20.6% increase compared with the previous score 2.62). The highest score was achieved in the sub-criteria "system for measurement and improvement of customer satisfaction", scoring 3.83 out of 5. The lowest score was achieved in the sub-criteria "Development of logistics activity department" (score of 2.47).

(ii) Petroleum and Plastic Industry: The evaluation result of logistics performance in petroleum and Plastic industry is shown in Figure 4b. The average score after improvement was 2.62 (19.1% increase, compared with the previous score 2.02). The highest score was achieved in the sub-criteria "Collaboration on logistics development with research and development institution, such as, research institution, university, etc", which scored 4.00 out of 5.

(iii) Electric and Electronics Industry: The evaluation result of logistics performance in the Electric and Electronics industry is shown in Figure 4c. The average score after improvement was 3.82 (47.5% increase compared with the previous score 2.59). There were two sub-criteria which scored the highest, the first one was achieved in the sub-criteria "Control and tracking of inventory (product/parts/WIP): accuracy and visibility" and the another one is the sub-criteria "Delivery performance and quality" which were scored 4.50, while the lowest score was achieved in 2 sub-criteria, "The Strategies for optimizing logistics system resources based on design for logistics" and "The Accuracy and adaptability of SCM planning" (scored 3.17)

(iv) Automotive and Autopart Industry: The evaluation result of logistics performance in automotive and auto part industry is shown in Figure 4d. The average score after improvement was 3.26 (6.2% increase compared with the previous score 3.07). There were three sub-criteria which scored the highest consist of the "System for measurement and improvement of customer satisfaction", "The Accuracy and adaptability of SCM planning" and "The Process standardization and visibility", which were scored 4.50 while the lowest score was achieved in the sub-criteria "Corporate strategy regarding logistics and its importance" (scored 1.75).

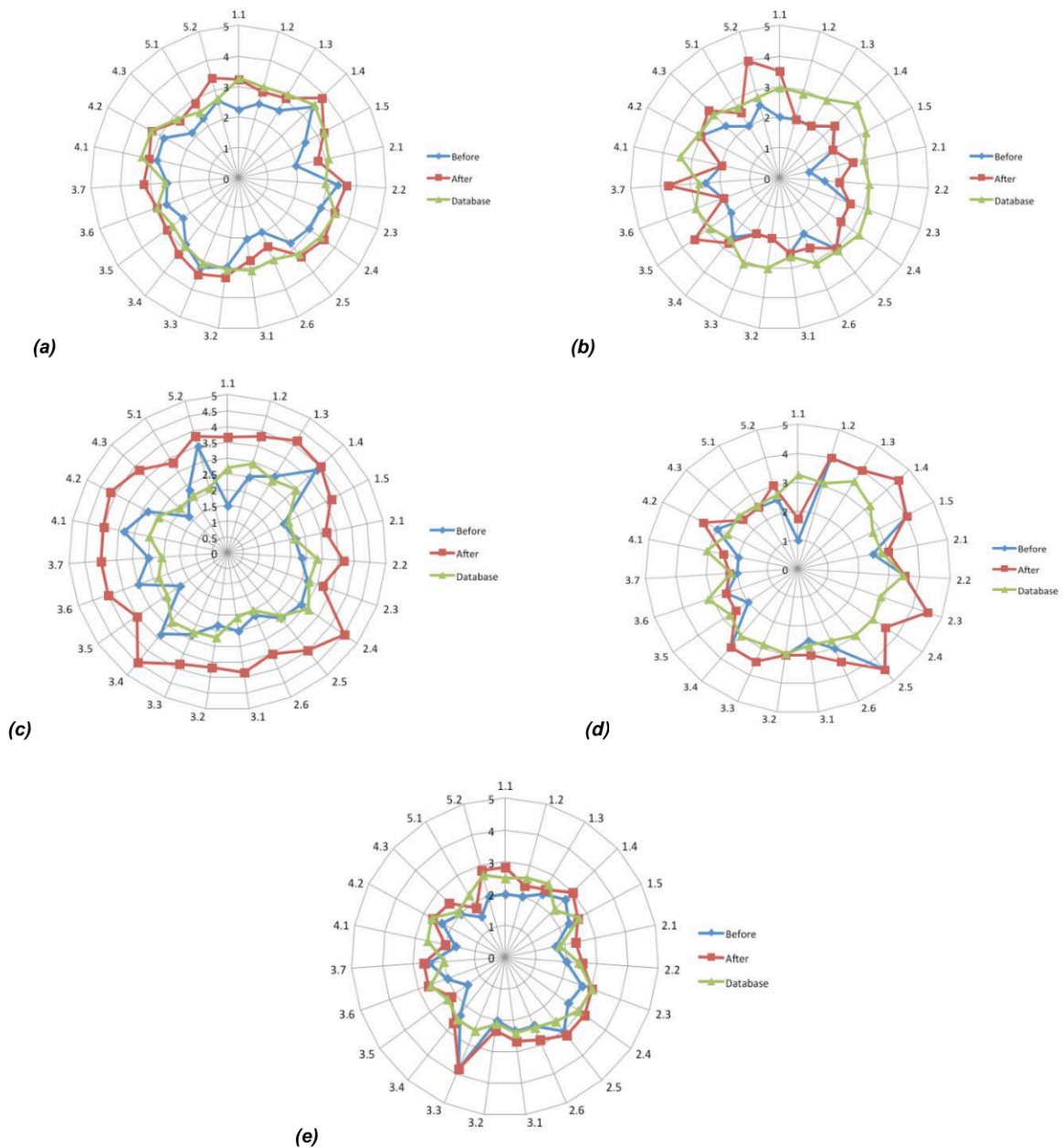


Figure 4. Evaluation results of logistics performance in the (a) food, (b) petroleum and plastic, (c) electric and electronics, (d) automotive and autopart, and (e) textile and garment industries

(v) Textile and Garment Industry: The evaluation result of textile and garment industry's logistics performance is shown in Figure 4e. The average score after improvement was 2.66 (18.8% increase

compared with the previous score, 2.24). The highest score was achieved in the sub-criteria "Customer lead time (from order placement to receipt) and load efficiency", which scored 3.83 while the lowest score was achieved in the sub-criteria "Collaboration on logistics development with business partners and with the same business cluster" (scored 1.83).

Company Code	Revenue, 2011 (Million USD)	ISIC Code	Industry VGO of each ISIC (Million USD)	VGO / sale	Cost reduction (Million USD)	Extended factor	An expected cost reduction (Million USD)	National extended factor	An expected overall cost reduction (Million USD)
F-01	10.67	1513	1946.83	182.52	0.043	10.0	0.432	15%	11.800
F-02	1.20	1513	1946.83	1,638.29	0.002	7.2	0.012	15%	3.033
F-03	1.67	1513	1946.83	1,163.45	0.005	10.0	0.054	15%	9.400
F-04	1.13	1513	1946.83	1,705.75	0.005	7.2	0.033	15%	8.467
F-05	491.30	1513	1946.83	3.96	0.061	7.2	0.441	15%	0.267
F-06	10.87	1541	1048.80	96.40	0.039	5.4	0.213	15%	3.067
F-07	38.20	1513	1946.83	50.95	0.041	4.2	0.171	15%	1.300
F-08	14.40	1513	1946.83	135.25	0.014	3.6	0.049	15%	1.000
F-09	4.97	1513	1946.83	393.03	0.037	7.2	0.268	15%	15.800
F-10	0.60	1544	866.33	1,443.89	0.123	5.4	0.666	15%	144.300
F-11	3.67	1531	3703.37	1,008.82	0.015	4.2	0.061	15%	9.267
F-12	0.73	1549	3073.60	4,231.67	0.075	7.2	0.540	15%	342.767
F-13	24.90	1513	1946.83	78.20	0.181	6.0	1.083	15%	12.700
F-14	43.03	1513	1946.83	45.24	0.018	4.8	0.087	15%	0.600
F-15	0.77	1513	1946.83	2,500.21	0.008	4.8	0.037	15%	14.033
P-01	0.40	2520	7996.60	20,142.57	0.002	8.0	0.013	15%	37.867
P-02	3.80	2520	7996.60	2,096.09	0.075	5.6	0.419	15%	131.600
E-01	0.33	2692	1223.43	3,819.20	0.007	9.0	0.062	15%	35.733
E-02	27.17	3210	16641.67	612.73	0.680	9.0	6.120	15%	562.500
E-03	31.97	3691	2381.90	74.55	0.115	4.8	0.552	15%	6.167
A-01	10.90	2899	4589.03	421.61	0.126	9.0	1.131	15%	71.533
A-02	1.03	3430	12465.47	11,966.85	0.145	4.2	0.609	15%	1092.967
T-01	2.73	1810	6607.60	2,403.64	0.066	4.2	0.279	15%	100.533
T-02	0.50	1810	6607.60	13,215.20	0.002	3.0	0.005	15%	9.033
T-03	6.43	1810	6607.60	1,028.05	0.024	4.2	0.101	15%	15.600
Total	733.37				1.908		13.439		2641.467

Table 1. Overall expected cost reduction

Cost reduction and performance improvement

The result of this project can be calculated as the percentage of cost reduction or increase in efficiency. By applying the logistics improvement project, logistics cost was reduced by 1.9 million USD (0.26%). By continuing this project, the total logistics costs can be decreased by 13.43 million USD (1.83%). If this project is to be applied all over Thailand, the logistics costs can potentially be decreased by more than 2600 million USD within 5 years, as seen in Table 1. According to the results shown in the research, we can clearly see that after executing the projects within the company, the logistics performances can be increased greatly.

Conclusion

Successful implementation of governmental logistics policy has been demonstrated. Case study of Northern Thailand is highlighted. This research work aims to improve the efficiency of the supply chain and logistics management of target industry. The outcomes are evaluated based on two criteria; improvement of logistics performance, and reduction of logistics cost. After the project implementation, increase in the logistics performance from 2.57 to 3.15 or 22.6% overall improvement for the industry was realized. This will directly translate into a reduction in the logistics cost of almost 2650 million USD within 5 years if these projects are to continue. With such a huge achievement, continual support and expansion of similar projects should be carried out in order to improve the overall logistics performance. This way, the industries and Thailand will become and remain winners in the current global market and the future to come.

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