Factors Influencing Company’s Logistics Performance in Industrial Areas, Phra Nakhon Si Ayutthaya Province, Thailand

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Abstract

This research aimed to compare company’s logistics activity management and examine the influence of each activity towards company’s logistics performance. The questionnaires were used and data were collected from 238 companies based in industrial areas of Phra Nakhon Si Ayutthaya Province, Thailand. Data were analyzed by way of descriptive and inferential statistics including frequency, percentage, mean, standard deviation, and multiple regression analysis. The finding revealed that those companies having altered number of employees, registered capital, and industry type were having logistics activity management differently. From regression analysis, the factors influencing company’s logistics performance could be prioritized as parts and service support, traffic and transportation, reverse logistics and logistics communications respectively.

Key Words: Logistics Performance, Influencing factors, Ayutthaya Province, Thailand  
JEL Classification:
1. Introduction

Today, the government has put a lot of emphasis on logistics management. It requires logistics to be one of the strategies for developing the country. Strategic plan for logistics system development in 2005-2008 and logistics industry development plan 2007-2011. The Ministry of Industry has prepared master plan for the development of industrial logistics system. (2012-2016), in line with the industrial development strategy and the framework of Thai industrial development in the period of 20 years (2010 - 2030), including the expansion of the strategic plan for the development of logistics system and logistics development plan for the industry in 2007-2011, to improve the potential of logistics and supply chain management to make it strong at both the enterprise and supply chain levels, and can effectively link business to the global supply chain. (Master plan for the development of industrial logistics systems (2012-2016) The Ministry of Industry). Phra Nakhon Si Ayutthaya is one of the most important economic zones in the country, with the third highest gross domestic product of the country, and is a province with continued economic growth. This province is located in Zone 2 Investment Promotion Zone. There are 3 industrial estates, of which there are 583 factories, both of which are Thai companies and multinational companies. Moreover, it has planned to develop the province for 4 years (2014-2017) to drive proactive strategy in the development of the province, with emphasis on the value chain of the economy and has set a policy to upgrade. The competitiveness of the industry aims to develop the manufacturing sector to be environmentally friendly and to create competitive opportunities. Moreover, there are strategies to increase production efficiency and reduce the cost of industrial enterprises to support the creation and expansion of industrial networks in accordance with the process of improving production efficiency. The goal is to increase the efficiency of production and reduce the cost of industrial operators, with the development of logistics in the industrial sector and promote continuous improvement in production management (TPM).

Therefore, the research team sees a great opportunity to raise awareness and develop the capabilities of industrial operators to ensure the logistics management of Ayutthaya and Thailand are in line with the policy, and industry operators will use it to develop and improve their performance to meet their customers’ needs and reduce the total cost of logistics to further enhance their competitiveness.

2. Literature Review

2.1 Logistics Management

Logistics is the key to the economy. It is a significant expense for businesses, which is affecting and affected by other activities in the economy. Improving the efficiency of the logistics process will directly affect the overall improvement of the economy. Today’s global business is increasingly focused on it. Because of it, the business can improve its
competitiveness. Its activities include activities such as transportation, inventory management and warehouse management. Good logistics planning will contribute to lower operational risk. (Rapana, 2009, p. 3). "Logistics" is a widely used term. The Council of Supply Chain Management Professionals; CSCMP, (2010) defines logistics as part of supply chain management in the planning, support and control of both the forward and reverse flow of goods and services, including the information from the beginning to the consumer to the highest efficiency, considering the customer satisfaction. It is concluded that logistics is the management of the work processes related to the main activities and supporting activities as follows;

**2.2 Key Logistics Activities**

Outlined below are the key activities required to facilitate the flow of a product from point of origin to point of consumption. All of these activities, listed alphabetically below, may be considered part of the overall logistics process (Joseph Canato,"A total Cost/Value Model for Supply Chain Competitiveness,"Journal of Business Logistics 13,no.2(1992)pp.285-301), While all organizations may not explicitly consider these activities to be part of logistics activities, each activities affects the logistics process. Stock and Lambert (2001) the activity is divided into 13 sections

1) Customer service has been defined as “a customer-oriented philosophy which integrates and manages all element of the customer interface within a predetermined optimum cost-service mix.” Customer service is the output of the logistics system. It involves getting the right product to the right customer at the right place, in the right condition and at the right time, at the lowest total cost possible.

2) Part and service support In addition to supporting production through the movement of materials, work in process, and finished goods, logistics also is responsible for providing after-sale service support. This may include delivery of repair parts to dealers, stocking adequate spares, picking up defective or malfunctioning products from customers, and responding quickly to demands for repairs.

3) Order processing entails the systems that an organization has for getting orders from customers, checking on the status of orders and communicating to customers about them, and actually filling the order and making it available to the customer. Part of the order processing includes checking inventory status, customer credit, invoicing, and account receivable.

4) Demand forecasting there are many types of demand forecasts. Marketing forecasts customer demand based on promotions, pricing, competition, and so on. Manufacturing forecasts production requirements based on marketing’s sales demand forecasts and current inventory levels.
5) Inventory management involves trading off the level of inventory held to achieve high customer service levels with the cost of holding inventory, including capital tied up in inventory, variable storage costs, and obsolescence.

6) Warehousing and Storage warehousing supports time and place utility by allowing an item to be produced and held for later consumption. It can be held near the location where it will be needed, or transported later is activities relate to warehouse layout, design, ownership, automation, training of employees, and related issues.

7) Traffic and Transportation a key logistics activity is to actually provide for the movement of materials and goods from point of origin to point of consumption involves selection of the mode, the routing of the shipment, assuring of compliance with regulations in the region of the country where shipment is occurring, and selection of the carrier. It is frequently the largest single cost among logistics activities.

8) Procurement is the purchase of materials and services from outside organization to support the firm’s operations from production to marketing, sales, and logistics. Procurement, also referred to as purchasing, supply management, and by a number of other names, includes activities such as supplier selection, negotiation of price, terms and quantities, and supplier quality assessment.

9) Reverse logistics is also involved removal and disposal of waste materials left over from the production, distribution, or packaging processes. There could be temporary storage followed by transportation to the disposal, reuse, reprocessing, or recycling location. As the concern for recycling and reusable packaging grows, this issue will increase in importance.

10) Plant and Warehouse site selection determining the location of the company’s plants and warehouses is a strategic decision that affects not only the costs of transporting raw materials inbound and finished goods outbound, but also customer service levels and speed of response.

11) Materials Handling is a broad area that encompasses virtually all aspects of all movement of raw materials, work in process, or finished goods within a plant or warehouse. Because an organization incurs costs without adding value each time an item moves or is handled, a primary objective of material management is to eliminate handling wherever possible. That includes minimizing travel distance, bottlenecks, inventory levels, and loss due to waste, mishandling, pilferage, and damage.

12) Packaging is valuable both as a form of advertising/marketing, and for protection and storage from a logistical perspective. Packaging can convey important information to inform the consumer. Aesthetically pleasing packaging also can attract the consumer’s attention. Logistically, packaging provides protection during storage and
transport. This is especially important for long distances over multiple transportation modes such as international shipping. Packaging can ease movement and storage by being properly designed for the warehouse configuration and materials handling equipment.

13) Logistics communications are becoming increasingly automated, complex, and rapid. Logistics interfaces with a wide array of functions and organizations in its communication processes. Communication must occur between, 1) The organization and its suppliers and customers. 2) The major functions within the organization, such as logistics, engineering, accounting, marketing, and production. 3) The various logistics activities listed previously. 4) The various aspects of each logistics activity, such as coordination warehousing of material, work in process, and finished goods. And 5) various members of the supply chain, such as intermediaries and secondary customers or suppliers who may not be directly linked to the firm. Communication is key to the efficient functioning of any system, whether it be the distribution system of an organization or the wider supply chain.

2.3 Performance

The researcher gave the definition of Performance as the final result of an activity for an organization's performance. It's the sum total of the final result of activities in all processes, all the activities of the organization. It is a complex concept, but it is important to understand the factors that drive high performance because the organization needs a high level of performance from every part in the organization.

Performance Measurement is as important as:

1. Asset Management: The process of acquiring, managing, improving, disposing of unnecessary assets, and designing business simulations to maximize the benefits of the assets.

2. Increase the potential for delivery to customers: It is very important to every organization, because if the customer does not get the expected value for the organization, they are going to search for another organization. Executives must think about how their organization can deliver the value the customer need.

3. Impact on organization reputation: We all know how important our reputation is in terms of how others view or think of us. It will influence the way that customers or partners will come to ask for advice that they will listen and trust us. This includes customers, suppliers, competitors, societies and others. The advantages of the organization's reputation include: Customer trust and it can set high prices.

There are several types of tools to monitor and evaluate tools organizations' performance such as.

- Financial Control
In this research, the researchers used Benchmarking for Best Practice tools to monitor and measure organizational performance. This is the best practice search among competitors or non-competitors. This will be comparable and will lead to better performance. (Dr. Asset. Prof. Dr. Ruth Panomyong, Logistics Performance Assessment Guide to the 2012 Standard Indicator for Entrepreneurship (LPI))

2.4 Conceptual Framework

The relationship model, there are independent and dependent variables. The technology marketing and technology self-efficacy are key determinant of using intention behavior mobile banking. They are hypothesized to have positive impact relationship between technology marketing, technology self-efficacy, technology acceptance and using intention behavior as shown in Figure 1.

The Studying Factors Influencing Company’s Logistics Performance in Industrial Areas, Phra Nakhon Si Ayutthaya Province, Thailand. There are independent and Company Performance dependent variables. as shown in Figure 1.
3. Methodology

3.1 Sample and Data Collection

In this research, data collection was conducted using questionnaires as a tool for data collection. The respondents were Representatives of entrepreneurs in Ayutthaya industrial area. Based on the Taro Yamane method, a total of 583 factories were selected by using the stratified sampling method. Simple sampling is then used to divide the population into industrial areas. The samples were classified into industrial areas in Phra Nakhon Si Ayutthaya, consisting of 5 areas such as Hitech Industrial Estate (it consisted of 138 factories and 56 factories were used as samples), Bang Pa-in Industrial Estate (it consisted of 89 factories and 36 factories were used as samples), Saharat Nakhon Industrial Estate (It consisted of 44 factories and 18 of them were used as samples), Rojana Industrial Park( It consisted of 252 factories and 103 of them were used as samples), and Factory Land( It consisted of 60 factories and 25 of them were used as samples), so there were 238 factories used as samples in this research. Most respondents were female (62.20%) aged 31 to 35 years (29.80%), holding Bachelor degree (78.60%), positioning in top management (47.90%). The company employs 201 employees or more (34.50%) with a registered capital of 50,000,001 or more (32.80%), forming a limited company (87.00%), classifying as a technology industry and clearly separates departments or divisions responsible for logistics (79.00%). Quality tools include: 13 logistic activities and 18 performance reviews. All of these structures were measured using a Likert scale of 1 to 5, with 1 indicating "strongly disagree". And 5 "strongly agree"

3.2 Reliability

In this point, we concern about the validity and reliability in the study. For testing the validity, factor analysis this analysis has a high potential to inflate the component loadings. It was employed to test the validity of data in the questionnaire. The reliability of the measurements was evaluated by Cronbach Alpha coefficient. In the scales reliability, Cronbach alpha coefficients are greater than 0.70 (Nunnally and Berstein, 1994). This study, Cronbach alpha coefficient higher than 0.70 and all constructs have values ranging from 0.79–0.91 Thus, internal consistency of the measures used in this study can be considered good for all constructs.

3.3 Statistical Techniques

Data were analyzed by way of descriptive and inferential statistics including frequency, percentage, mean, standard deviation, multiple regression analysis using Enter to present and the conclusion of research to test the difference of each sample significant level at 0.05 and gist to improve the system of logistics activity management.
4. Results and Discussion

Table 1 shows the One-Way ANOVA and Paired Difference Test using Least Significant Difference (LSD) analysis results that those companies having altered number of employees, registered capital, and industry type were having logistics activity management differently.

Table 1: One-Way Anova and Pair Difference Test Results of General Factors of Entrepreneurs, Logistics Activities Management and Company Performance

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Sources of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of Employees</td>
<td>Between Groups Within Groups</td>
<td>11.97</td>
<td>4</td>
<td>2.99</td>
<td>8.99</td>
<td>0.000*</td>
<td>Accept the assumption 1.1</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>77.53</td>
<td>234</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Registered Capital</td>
<td>Between Groups Within Groups</td>
<td>12.67</td>
<td>2</td>
<td>6.34</td>
<td>19.38</td>
<td>0.000*</td>
<td>Accept the assumption 1.2</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>76.83</td>
<td>236</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Type of Industry</td>
<td>Between Groups Within Groups</td>
<td>8.87</td>
<td>3</td>
<td>2.96</td>
<td>8.58</td>
<td>0.000*</td>
<td>Accept the assumption 1.4</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>80.63</td>
<td>235</td>
<td>0.35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05

From Table 1, it is found that the analysis compares the differences in the general factors of the companies in the industrial area by the number of employees. When considering income, it is found that the companies different number of employees are: Less than 25 people - 25 people, 51-100 people, 151-200 people and more than 201 people. The registered capital is different from lower than 10 million baht, 10 million baht - 50 million baht and more than 50 million baht. The different types of industry are found in agriculture and food groups, which differ from the technology and raw materials industries. This is consistent with Derwik Pernilla, Hellstrom Danie and Karlsson Stefan (2016) who explored the characteristics of logistics management and supply chain management. The findings suggest that logistics and supply chain managers use their general business management capabilities and practical behavior rather than supply chain management expertise which is exceeding the capacity of each person. In particular, the company's experience is a core competency that the manager will share with others, and will affect the manager's ability. This research has four proposals for future research and is consistent with Supatsara Panyorattaroj. (2016), who examined Logistics Management in a Competitive Advantage of the Entrepreneur Pottery Industry.
Table 2: Regression Results of Logistics Activities Management with Company Performance

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>Std.Error</th>
<th>( \beta )</th>
<th>t</th>
<th>Sig.</th>
<th>Adjusted ( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant (a)</td>
<td>-0.050</td>
<td>0.146</td>
<td>0.153</td>
<td>0.344</td>
<td>0.731</td>
<td>0.812</td>
</tr>
<tr>
<td>1. Part and service support</td>
<td>0.131</td>
<td>0.056</td>
<td>0.135</td>
<td>2.324</td>
<td>0.021*</td>
<td></td>
</tr>
<tr>
<td>2. Traffic and transportation</td>
<td>0.174</td>
<td>0.065</td>
<td>0.191</td>
<td>2.687</td>
<td>0.008**</td>
<td></td>
</tr>
<tr>
<td>3. Reverse logistic</td>
<td>0.146</td>
<td>0.051</td>
<td>0.169</td>
<td>2.855</td>
<td>0.005**</td>
<td></td>
</tr>
<tr>
<td>4. Logistics communications</td>
<td>0.171</td>
<td>0.052</td>
<td>0.190</td>
<td>3.312</td>
<td>0.001***</td>
<td></td>
</tr>
</tbody>
</table>

*\( p \leq 0.05, ^{***}p \leq 0.01 \) *Beta coefficients with standard errors in parenthesis

Table 2 shows the test results of the statistics by Regression analysis with the Enter method. The research found that Management of logistics activities positively affected the performance of the company in Phranakhon Si Ayutthaya industrial area (\( \beta = 0.153 \)) with the predictive coefficient (R2) and of 0.812 and can predict the efficiency of logistics activities management on the performance of enterprises 81.20 percent in terms of Part and service support, Traffic and transportation, Reverse logistic and Logistics communications, based on assumption 2. However, Customer service, Order processing, Demand forecasting, Inventory management, Warehousing and storage, Procurement, Plant and warehouse site selection, Material handling and Packaging are not consistent with the assumptions. The findings are in line with Lambert, Douglas M; Pohlen, Terrance L. (2001), who found that most supply chain indicators were true in terms of internal logistics measures and had a direct impact. On the performance of the company, Ramanathan, R. (2010) studied the role of risk-enhancing and performance variables in the relationship between logistic performance and customer loyalty in E-Commerce. This study aimed to examine the relationship between logistics performance. And customer loyalty in the context of conducting business between the company and its customers in the electronics sector (B2C). Analysis based on the ranking of the site www.epuliceye.com during 2006-2007. The ratings range from 1 to 10, meaning that 1 means poor logistics performance and 10 means the result in Logistics is very good. There were 490 web sites used for the analysis of this study and it was found that factors that affect the success of the operation were on-time delivery, satisfaction in customers' need responding, customer support, returning and refunding, easy accessing, payment process, price comparison and confidentiality. Moreover, research by Helena Forslund, (2017) found that reverse logistics management was a new concept that was important and profitable to sustainability. Some manufacturers were involved in product recovery to reduce costs and optimize reverse-shipment processes before pre-release. Jørsfeldt, Liliyana Makarova et al. (2016) studied the Danish company's perspective on sustainability, which would provide logistics services to 3PL, but still maintain internal logistics as a boundary function. Especially in terms of operational coordination, which was affected when the company introduces environmental sustainability targets.
Companies in the industrial estate had 13 activities in logistics management. However, the activities that influenced and affected the operation were part and service support. Replacement spare parts made it possible to continue production when the machine was damaged, and there were backup devices for customers when an emergency. There was clearly defined after-sales service policy, fast turnaround after sales service and the highest customer satisfaction achieved due to the company's focus on efficient after-sales service. Traffic and transportation: Delivering products to customers at the right time, at the specified amount and timely according to the agreed time, can choose the transportation method to meet the characteristics of the goods or business to create confidence to customers and can efficiently deliver and control the transportation costs. Reverse logistic: The company had a policy and process to handle the returned goods efficiently. There were ways to handle returned goods in the right way and strictly follow the rules with the standard return process in order to create confidence for customers. Policies were set in case the company's products were dangerous goods that affected the environment. The company had a product destruction system and Logistics communications with the establishment of a good logistics communication system can be linked to various departments quickly and accurately. Software used in communication, such as Electronic Data Interchange (EDI), which was linked to the flow of information, enabling continuous business operations, and had the form of data communication in the organization that was easy, fast, convenient and unified, which can meet the needs of customers effectively.

5. Conclusions and Recommendations

5.1 Theoretical Contributions

This research was trying to understand the relationship of management activities in logistics that affected the operation of the company in the industrial estate by using the frame theory to explain the difference and relationship. It was also intended to study the comparison of logistics activity management in the company and study the influence of each activity on performance of logistics. Moreover, this study was trying to include the influence of logistics activity management to the performance of the company. The overall results showed that the hypothesis had been accepted. This showed that this study can be applied to promote and develop the logistics activities. In addition, it confirmed the difference of the number of employees, registered capital, and the industry type that affected the performance of logistics activities in each company and confirmed the relationship between logistics activity management (part and service support, traffic and transportation, reverse logistic and logistics communications) considerably. In fact, presently, the performance of logistics management can enhance the ability of the organization and make organization has competitive advantage.
5.2 Managerial Contributions

This study helps entrepreneurs understand the difference between the information of the company in logistic activity management and the relationship between logistic activity management and the company’s performance due to increased competition from foreign countries. The organization needs to adapt by adding credibility and responsiveness. For this reason, businesses seek to find best practices by managing logistic activities as an important tool in business competition. To achieve efficiency with the lowest cost management by having a plan to reduce the costs associated with logistics. It also has a written target and cost information is analyzed to be used in the management process of logistics management to meet the goals and to meet the needs of customers effectively. Moreover, there is continuous control and follow-up service to customers, thus, customers are satisfied with every service. It is fast response to customer needs. Also, having a system in place to deal with customer complaints to improve operations or resolve them quickly by creating value in providing a variety of services.

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