

LOGISTICS PERFORMANCE MEASUREMENTS: A DESCRIPTIVE ANALYSIS

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Abstract

Logistics give a positive impact for the competitiveness of the country. Thus, the measurement of logistics performance for logistics industry will give a benchmark for industry to enhance industry's performance towards competitiveness. The purpose of this paper is to examine logistics performance based on update of Abu Bakar, Jaafar, Faisal, & Muhammad (2014) paper and a questionnaire mailed to the logistics and operation managers with 121 respondents from logistics service provider (LSP) companies. The questions consist of eight (8) items of performance measurement in logistics. The finding in this paper provides a benchmark for organisations for assessing the quality of Malaysian logistics performance measurement practices and helps identify opportunities for improvements.

Introduction

An International Journals of Benchmarking has published a number of studies of logistics performance related with various perspectives (Anand & Kodali, 2008; Chan, Chan, Lau, & Ip, 2006; Keebler & Plank, 2009; Rahman, 2011; Shaw, Grant, & Mangan, 2010) including green logistics, reverse logistics, benchmarking models and the benchmarking from the view of LSP. It is increasing in academic topics about benchmark in a recent decades and significant as a practical method for such improvement in areas of business (Anand & Kodali, 2008). The articles that related to body of this research has summarized some significant findings :

1. Components of benchmarking include quality, technology and competitive cost.
2. In terms of performance, quantifiable characteristics such as speed, reliability and price etc. are measured.
3. Benchmarking tools vary and only a few could work with particular service industry

Anand & Kodali (2008) have pointed out very comprehensive views in regard benchmarking. They also concluded definitions of benchmarking as *[...] a continuous analysis of strategies, functions, processes, product or services, performances, etc. compared within or between best-in-class organisations by obtaining information through appropriate data collection method, with the intention of assessing an organisation's current standard and thereby carry out self-improvement by implementing changes to scale or exceed those standards.*

The World Bank has also developed Logistics Performance Index (LPI) survey, which collects data from 160 countries. This survey is a benchmarking tool to measures performance along the logistics supply chain within a country (Arvis et al., 2014). On the other hand, there are few academic journals and papers focuses on the Malaysian logistics industry (Md Ali, Jaafar, & Mohamad, 2008; Sohail & Sohail, 2003) and performance context. Zursimi, Mohd Rafi, & Dahlan (2013) focus on logistics development in East Coast region of Malaysia, whereas Ali, Jaafar, & Mohamad (2008) emphasize four difference perspectives to views Malaysian logistics industry. From that study, policy has been regarded as the significant component that influence the competitiveness of the industry. Sohail & Sohail (2003) conducted a survey to determine a usage of third party logistics (3PL) services in Malaysia. They found out by using 3PL, give multiple benefits such as time and cost savings, improved customer services and the benefits of freight payment.

Eventhough the World Bank has released a report regarding the LP, however, to date, most of the studies, and consequent publications, in the area of transport and trade facilitation performance to benchmark were developed by non-academic institutions (Batista, 2012).

Theoretical Definitions

A definition of performance measurement (PM) still remains a broad topic (Neely, Gregory, & Platts, 2005) by reason of differences in objectives and focus of study. Several authors discussed on performance measurement with different structures and details based on their performance functions (Adel El-Baz, 2011; Amaraturanga & Baldry, 2003; Banomyong & Supatn, 2011; Beamon, 1998).

Mentzer & Konrad, (1991) defined PM is an analysis of both effectiveness and efficiency in accomplishing a given task. Efficiency is a measure of how economically the firm's resources are utilized and effectiveness refers to the extent to which customer requirements are met. Langley & Holcomb (1992) extended the definition by adding differences as the ability to create value for the customer through the uniqueness and distinctiveness of logistics services.

In today's competitive environment, the context of PM becomes broader. Waggoner, Neely, & Kennerley (1999), suggested four elements that force impacting PM system:

1. Internal influences: power relationships, poor pressure
2. External influences: legislation, market volatility
3. Process issues: manner of implementation, innovation saturation
4. Transformational issues: degree of top-level support, risk of gain/loss from the change.

Review of The Existing Researchs on Measuring Logistics Performance

Abu Bakar et al. (2014) make some conclusion based on an exploratory study that found customs and logistics cost are the main discussed by practitioners in Malaysia. Whereas, the other two components, namely communication and environmentally in logistics also have been highlighted. Ling, Goh, & Desouza (2008) have identified cost and service capabilities are the top criteria in the selection of the service providers and find out that visibility and pro-activeness are key factors for total customer satisfaction. Andersson, Aronsson, & Storhagen (1999) have identified model for evaluating a company's overall performance focusing on balancing the conflicting purposes of financial and physical measurement.

On the other side, policy is recommended as priority area to reform an expansion of trade both within South Asia and with the rest of world, thus it demonstrates the importance of trade facilitation as instrument to expanding the trade activities (Otsuki, Honda, & Wilson, 2013). Batista, (2012) using Delphi study to developed a framework structure by critical operations performance factors operationalized in terms of trade and transport facilitation. Gupta, Goh, Desouza, & Garg (2011), found some barriers to freer cross-border trade within ASEAN. Unwidely customs procedures and inspections, lack of coordination and arbitrary rulings are some barriers that were highlighted.

The overview of some of existing research shows that, there are important to establish a benchmark with operational and trade facilitation for future development. This paper presents a descriptive analysis from the practitioners of the Malaysian logistics performance and provide a benchmark for improving the current level of performance.

Research Methodology

Based on these findings, the components of Arvis et al., (2014), as well as previous research, a questionnaire was developed. The mailing list came from the membership list of the Federation of Malaysian Freight Forwarders (FMFF) and the Companies Commission of Malaysia (SSM). All data then merge and strictly there are no missing data and redundancy. The final list represented local and international LSP, as well as with asset and non-asset LSP. The final list included a total of 1030 companies. A total of 17 surveys were undeliverable for a net mailing of 1030 surveys, and with 121 returns. The net response from this survey is 12 percent which is almost the same as study by Kaebler & Plank (2009) by 11 percent. Most of the list contained potential positions such as executives, managers and directors with experience within two to 20 years in logistics operations.

Next, the research instrument has been analysed using the statistical analysis software to generate frequencies and mean to provide scores for every component. The scores are illustrated in a graph to show the performance provided by the respondents. The results are compared for further analysis and the significant findings in this study that will be concluded for the future research.

From the analysis, it was identified that the Cronbach's Alpha of this 8 items is 0.71-0.73. According to Gitem & Gitem (2003), they provide the following rule of thumb based on George and Mallery (2003), the Cronbach's alpha coefficient is greater than 0.70 is considered as good. It is indicated good internal consistency of the items in the scale. This is supported by Nunnally & Bernstein (2008) that indicated a reliability coefficient of 0.70 and above considered more than acceptable for most behavioral science applications.

Findings and Analysis

Characteristics of respondent

The sample respondents have a broad range of characteristics. From 121 respondents of LSP, 72.7 percent or 88 respondents are an asset based company, whereas the balance of 26.3 percent or 33 respondents are non-asset based. Based on the finding, almost half of the companies (47.9%) were established more than 20 years in Malaysia and 14.9% as second largest respondents had been operating between 5-10 years. Table 1 shows the results the classification of organizations.

Characteristics	Frequency	Percentage
Years of Establishment		
Less than 5 years	15	12.4
Between 5-10 years	18	14.9
Between 10-15 years	13	10.7
Between 15-20 years	16	13.2
More than 20 years	58	47.9
Classification of Asset		
Yes	88	72.7
No	33	26.3
Experience in logistics area		
2-5 years	70	57.9
6-10 years	20	16.5
More than 10 years	31	25.9

Table 1: Profile of organization

Eight key components measuring LP in Malaysia are answered accordingly. It is based on their experience and working arrangements in the logistics industries to assess the LP. It is based on five-scale measurements 1 (lowest) to 5 (highest).

Question 1: Efficiency of customs

Two subsections are according to (a) logistics process and facilities and (b) experience dealing with the customs department.

Efficiency of customs	Mean
(a) The efficiency of the following logistics processes and facilities	3.02
(b) Experience dealing with the customs department	3.08

In general, the overall average score (mean) for customs efficiency is 3.04. Thus, it is between average and efficient score. For the efficiency process measures, most of the respondents (more than 50 percent) are not satisfied (inefficient) with import and export clearance process due to lateness in the process of documentation and declaration. Thus, it is affected on time delivery to the consignee. In addition, it is about 28 percent of respondents have an experience with criminal activities such as stolen cargo.

Question 2: Infrastructure

Malaysia has a good quality trade and transport related infrastructure	Mean
	3.33

As expected, the exploratory study (Abu Bakar et al., 2014) showed that Malaysian infrastructure in general have an excellent infrastructure. Based on surveys, respondents agree that we have a good quality related to infrastructure. However, for the specific questions, more than 35 percent of respondents stated that they disagree with the quality of telecommunications infrastructure and IT service. Even though it is a minority of the respondents, but again this will give an effect in the future and the same continuing issues need to be resolved.

Question 3: Logistics Cost

Two subsections are according to (a) Competitive price shipments (Based on transport modes) (b) Operational logistics charges and rates in Malaysia (Based on transport modes)

<i>(a) Competitive price shipments</i>		<i>(Mean)</i>
Trucking		3.35
Air Freight		3.54
Sea Freight		3.69
Rail Freight		3.56
Warehousing/Transloading Facilities		3.66
Agent Fees		3.67
<i>(b) Operational logistics charges and rates</i>		<i>(Mean)</i>
Trucking		3.02
Air Freight		3.26
Sea Freight		3.36
Rail Freight		3.11
Warehousing/Transloading Facilities		3.01
Agent Fees		3.12

The third question attempted to place logistics performance measurement in the logistics industry in terms of logistics costs. The respondents were given four major transport modes and additional with warehousing and agent fees. The results are interesting. It is not surprising that the logistics cost average showed for a competitive price is 3.58, which is competitive. Based on the overall average score, logistics charges remains 3.15. The lowest logistics charge is sea freight. However, most of the respondents agreed that trucking and warehousing/transloading facility charges are high.

Question 4: Competence and quality of logistics services (Mean)

Three subsections are according to: (a) Competent of logistics operators (b) Transport and logistics industry provides good quality service and (c) Activities and procedures of the following has improved

(a) Competent of logistics operators	<i>Mean</i> 3.62
(b) Transportation and logistics industry provides good quality service	3.60

<i>(c) The following activities and procedures of the following has improved (Mean)</i>	
Customs clearance procedures	3.61
Other border-related government agencies clearance procedures	3.49
Quality of trade and transport related infrastructure	3.61
Quality of telecommunications/IT infrastructure	3.49
Quality of private logistics services	3.51
Regulation related to logistics	3.60
Solicitation of informal payments in connection with logistics activities	3.44

The fourth question addressed the competence and quality of logistics services in Malaysia. Based on the survey, average scores for subsection (c) is 3.51 and overall score for the fourth question is 3.58. From this point of view, this study concerned about informal payments because of lowest score received. In addition, the telecommunications/IT infrastructure also received lower scores from the surveys and other border-related government agencies clearance procedures as well.

Question 5: Track and trace consignments

<i>It is easy to track and trace consignments</i>	<i>Mean</i>
Trucking	3.71
Air freight	3.67
Sea freight	3.58
Rail Freight	3.72

Track and trace consignments is a complement to physical infrastructure. This component plays a key role in a global supply chain to be a competitive advantage in logistics operation and movement. This application also can be an impact in terms of preparation an schedule of manufacturing operations.

The average overall score for this key component is 3.67. Most of the respondents agree that the consignments are easy to track and trace. The results show that the mean score above 3.70 were for trucking and rail freight item – 3.71 and 3.72 respectively.

Question 6: Timeliness

Consignments reach the consignee within the expected time (Mean)	
Trucking	3.53
Air freight	3.39
Sea freight	3.35
Rail Freight	3.35

The sixth question addressed the respondents view of timeliness for logistics performance measurement. Rail and sea freight are shared the lowest score of 3.35. We constructed „Strongly Disagree“ to „Strongly Agree“ with the center point being labeled neither/or. Based on overall average, the score for timeliness is 3.37 which is equivalent to “agree” that most of consignments reach the consignee within the expected time.

Question 7: Others	Mean
a. Environmentally friendly Environmental activities in your company with logistics activities	3.60
b. Communication	3.68

Last but not least, the perception of respondents regarding environmental activities within their company. The specific questions, including set environmental objectives and have planned their operations to take productive action to solve environmental problems. It is not surprising that almost all respondents agree that they set environmental activities in logistics operation. However, according to Abu Bakar et al. (2014), the practitioners claimed their priority is delivering goods on time at the lowest cost possible.

Based on the result of the communication – 3.68 for better and important of communication such as developing information system, improving customer service an utilising mobile solutions are indicated as important for Malaysian logistics industry. These future developments are needed for most of the firm in logistics operations.

Discussion and Conclusions

This research has provided a remarkable contribution in that it has provided a benchmark for the logistics performance measurement in Malaysia. Several conclusions from the research can be done. Most respondents to the survey are not understood about logistics performance measurement and the components itself. Even though the components of LP is a broad topic, but they need to comprehensively measure logistics performance. From the results, we can conclude that the average score of this LP is between 3.00 to 4.00. In addition, several significant items should be noted namely customs that received the lowest score 3.04 as well as timeliness and cost. In addition, further study also needs to figure out on the customs procedure process that has been improved, but the overall score for customs is lower. Figure 1 shows the overall score for the 8 items that were highlighted above.

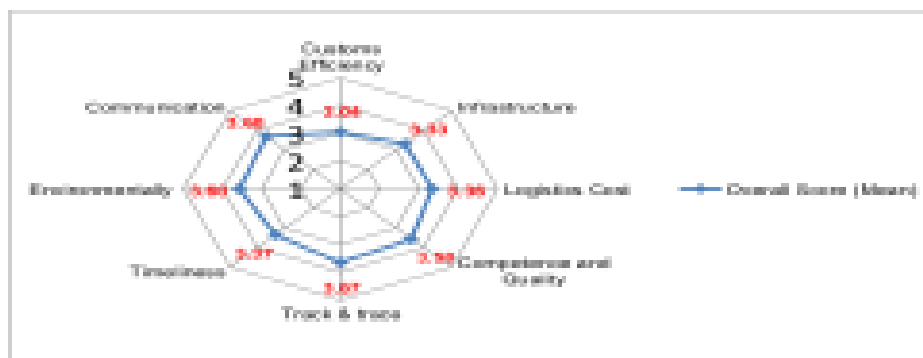


Figure 1: Overall Score (Mean)

For Malaysian logistics industry, it is important to establish a clear relationship between performance and variables. Further research on correlation analysis between performance and variables (cost, infrastructure, cost, competence and quality, track and trace, timeliness, environmentally and communication) in the context of Malaysian logistics will be an interesting result. In addition, comparison in perspective of manufacturers also gives a positive impact in the development of the Malaysian logistics industry.

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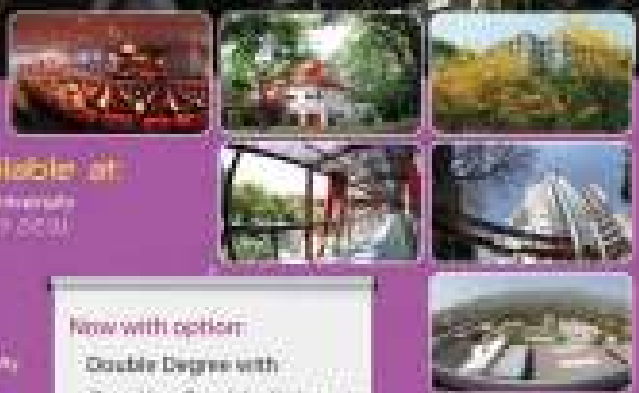


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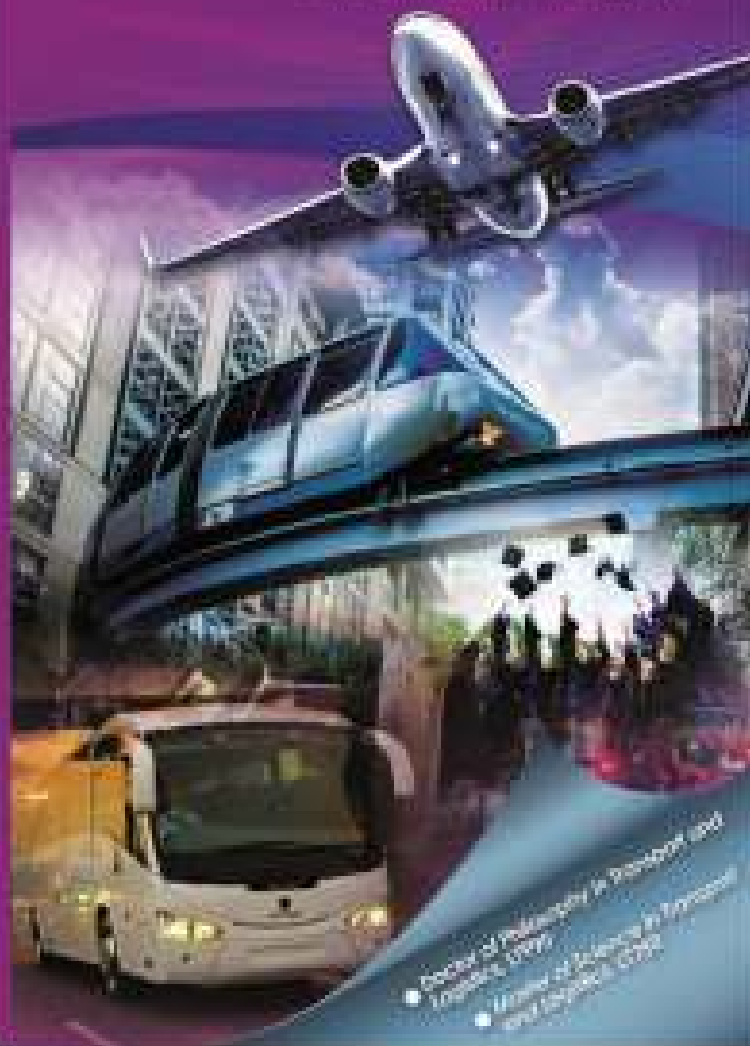


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