Innovative Logistics Practices: Assessment of Third-Party Logistics Services Providers In Malaysia

Abstract

In the contemporary business global sphere, it is so problematic, if not impossible, for a organization to be competitive deprived of working in alliance, closely with external associates. The idea of Supply Chain management, (SCM), arose in this track and strives to optimally manage the physical goods and/or services. Logistics is the key competitive factor in the manufacturing sector because of the innovative models' variants and options. For instance, in Malaysia, manufacturing sector is a major contributor to the annual GDP, hence, there is need for sustainable technology that can project a significant business operations and supply chain management impacts. But this is far from being the case in the contemporary. Based on the increasing logistics benefits, the important of the assessment of logistics efficiency and impact is attracting increase consideration. Green Logistics (GL) involves not only the delivery of green products or services to customers, but also the inclusive logistics flow of items from cradle to grave, and this is in addition to reverse logistics. Numerous green events and operations have been instigated, such as manufacture scheduling and network construction. This article aimed at investigating the innovative logistics practices relationship with the operations of third-party logistics service providers in Malaysia. To achieve this, the study engages structured questionnaire survey. 256 questionnaire was retrieved out of 333 questionnaires distributed electronically and 27 questionnaire was rejected based on some parallel errors and 229 questionnaire was eventually analysed. This is 69% of the questionnaire. In the analysis, SPSS version 20 was utilized. The outcome showed that innovative green logistics serve as a moderating factor in the relationship between 3PLs service provider's key performance factors and green logistics in the Manufacturing industry of Malaysia. Hence, it fulfils one of the key economic growth activities or operations under strategic thrust 2 of SPV2030.

Keywords: Third Party Logistics, Supply chain management, Innovative green logistics.

Introduction

The concept of green logistics and supply chain management was initially introduced in 1990 and it involves management of inventory, relationship between supplier and customers, delivery of product and all other activities that is connected with the flows of goods commences from procurement of raw materials to the phase of distribution to the end users. Based on the ever-increasing awareness of environmental impact, green logistics and supply chain management was introduced and it became an innovative revolution in the present era. (Vijayvargy, 2021). And it was established in previous research study that adoption of certified EMS according to ISO 14001 would result to a prefer environmental

performance in a standard organization. The process of adoption of environmental management system, (EMS, can result to greater ease for the application of green logistics and supply chain management and after all all brings about overall performance impact of the organization. Any organization that embraces green logistics and supply chain management process and procedures may likely have a boost in their performance economically and their competitive advantages, as a result of ISO 14001 in connection to their related positive performance (Vijayvargy, 2021).

In this same vein, green purchasing is expressed as a method of purchasing to ensure waste minimization when engaging in purchasing process such as suppliers selection, process of evaluation, acquisition of raw materials, recycling and reuse in total compliance with international and national standard of environmental protection (Younis et al., 2016). The method is also in consonance with the vision and objectives of organization relative to sustainable performance (Hassan et al., 2016). As established in a study, green purchasing practices which spur green logistics and supply chain management will surely bring about a boost to the performance of an organization in the long run (Nderitu & Ngugi, 2014). This is because all the process of purchasing will comply with standard procedure of environmental protection and thereby build a right green image in the society especially in the market and eventually maintain the performance of the business.(Audu, 2018).

This innovative practice consists of so many operations which might be beneficial to the overall performance of the organization involves. It will also spur the evolvement of cleaner technology to attain sustainable performance in manufacturing as well as logistics and supply chain management operations. All these combine is assumed to offer a significant input to sustainable performance of any organization in logistics and supply sector. (Muma et al., 2014).

Green Logistics and supply chain management are observed to be eco-friendly practices, and it involves water efficiency, environmental conservation, waste management, reuse and recycling, management of toxic and hazardous substances and transportation optimization (Sabat, & Krishnamoorthy, 2018). It was also highlighted that logistics green logistics and supply chain management can be implemented at the following stages design stage of the product, at the source stage, and the supplier selection stage, procurement and logistics control stages, as well as manufacturing stages.

Even when many other research studies have analysed innovative green logistics and supply chain management in many developed countries, these particular studies may not measure up to what is obtainable in developing countries like Malaysia, may be due to differences in cultures and the degree of economic development. It was asserted in research, (Dubey, Gunasekaran, & Papadopoulos, 2017), that in comparing to developed nations, the application of green logistics in the emerging market are with features like lower levels of economic development. It is observed that all necessary variables for the adoption of innovative green logistics and supply chain may differs from one country to the other. This justifies the significant and rationale of conducting this type of research on innovative logistics services and focusing on 3PLs service provider in Malaysia manufacturing sector. This is to breach the knowledge gap that may arise as a result of this innovative logistics services in the sector within Malaysia context.

Striking an adequate balance between economic contribution and environmental protection is seen as an immediate step to be taken in the logistics industry as it an issue of concern for government and environmental stakeholders and institute globally. To resolve this great challenge of environmental pollution that causes global warming, green logistics has been advanced. In a general view, organizations executives implement green logistics, its successful operation relies heavily on the operation details of the organization and the

employees' values of the green logistics policy (Kim & Choi, 2013). Hence, a research based green logistics awareness and the character tendencies of those in charge of implementing the green logistics policies, particularly in Malaysia, are important and germane. The research can offer insight regarding the operation and practices of green logistics, standardize organization green logistics behavior in Malaysia and as well promote the organization policy making. Hence the important of this research in Malaysia third party logistics service provider context.

Currently, striving of business receive an upsurge to prove that they at competitive advantage over their competitors. This comes with the challenges of the necessity of have aptitude adapting of ever-changing cutomers' demand. Hence, any slightest mistake or negligence in acquiring the trust of customers' satisfaction may result to a catastrophic loss in business. Based on this fact, it is germane for an organization to be able to come to terms with strategies that are relevant in the modern days marketing mix to improve the logistics performance and services quality by engaging the services of third-party logistics providers. (Rahmat, et al., 2019;). Therefore, 3PL is very germane and acceptable concept. It involves all organization that coordinates, supplies, and engage logistics techniques and operations in supply chain process. The performance quality of innovative logistics outsourcing relative to third party logistics is still on going research field which still call for more indepth study.

The current trend of logistics sector in Malaysia is concentrating on the logistics operation out-sourcing as well as growth of Third-Party logistics (3PLs) according to (Mustaffa & Potter, 2009). Nevertheless, the issue related to cost seems most significant influence on the development and 3PL growth with higher aids for both minimization of lead delivery time and cost (Mustaffa & Potter, 2009). This cogent view was corroborated by Sohail et al. (2006) where the authors established that 67.7% Malaysian organization engaged

the contract logistics services with principal focus on the local operation meanwhile, Singapore 3PL sector focused on international level.

In term of economic, social and environmental benefits of green logistics and supply chain management, there are general believe and all-embracing acknowledgements which reflects that sustainable logistics and supply chain management yields the significant benefits, as well as anticipated negative ecological influence (Thiell et al., 2011). One, out of all the logistics procedures that have the emissions of carbon dioxide and similar greenhouse gases are automobiles, vessels for good transport, and airplanes produces environmental pollution, this is overall known as the main cause of global warming that is usually consider as a threat to the universe. Likewise, associated logistics operations result to acute water and air pollution, fuel consumption and solid garbage disposal (Lin et al., 2011). In order to militate against all these challenges, the idea of green or sustainable logistics was born to alleviate it and also to describe logistic system that implement technology facilities that are of cutting edge, so as to minimize ecological harm in the process of increasing assets utilization. Logistics with green features is a unique sustainable growth idea that can alleviate environmental challenges while maintaining the operations and organization economy as well as country in the process of goods and services exchanges, (Guirong et al., 2012). Likewise, green logistics aid organizations as well in dealing efficiently with the relationship between environmental protection and logistics growth, as well as make interest economically, social interest and environmental interest, in bond of unity (Guoyi & Xiaohua, 2011). It is highly significant that organizations acknowledge that green logistics can result into a sound stream of business benefits conventionally (Piecyk et al., 2012). Hence, the aim of this study to investigate the influence of Innovative logistics practices on the performance and operations of third party logistics service providers in Malaysia.

In the period of last decade, the Malaysia economy grew with an outstanding rate of 6.2% in 2017 when compared to what was recorded in 2016 which was 4.1%. Aside the global trade level of trade which also contribute to the dramatical membership of the Malaysia in the World Trade organization (WTO). But with increasing globalization derive on environmental issues, Malaysia as a country need to consider the environmental implication of their logistics and supply chain management processes and procedures(Mangan, & Lalwani, 2016). In addition to this, sharing their interests with international communities and partners is germane matters by means of competitive operations, economic pressures and environmental influence with good results to show for it . Hence, Malaysia has grown in term of logistics and supply chain management practices (Othman, et. al.,2016). Therefore, a research study of this article is necessary to see the impact of the innovative logistics by third party logistics service providers in Malaysia manufacturing sector.

Literature Review

Third Party Logistics (3PL) is playing a noteworthy role in today's supply chain management. Business organizations need the service of this company to outsource part or all of their supply chain procedures to lessen the load of logistics activities and attain customer satisfaction and general performance. Logistics with green features (GL) is fast attaining growing thoughtfulness among experts in both academic and industry. This is owing to the mounting weakening of the environment. Countless green actions and processes targeting at refining GL performance that have been functional unnaturally, and tangible number of their operations can be displayed as combinatory optimization complications. This research goal is to investigate and advance, by mean of coordination, the performance of a green supply chain involving of a monopolistic manufacturer, a third-party logistics (3PL) service provider and numerous autonomous retailers. In the face of the difficulty of each retailer's demands that is

uncertain but sensitive to retail price as well as the unexpected production disruption which may occur at the source at any time, push more pressure on the 3PLs company.

In the contemporary business global sphere, it is so problematic, if not impossible, for a organization to be competitive deprived of working in alliance, closely with external associates. The idea of SCM arose in this track and strives to optimally manage the physical goods and/or services. Logistics is the key competitive factor in the manufacturing sector because of the innovative models variants and options. Based on the increasing logistics benefits, the important of the assessment of logistics efficiency and impact is attracting increase consideration. LPM, (Logistics performance management), is a pivotal to ascertain and enumerating the present position and the capacities for growth in logistics. In order to give adequate details of the increase importance of supply chain, logistics performance management is expected to commence from the supplier and pending the original equipment manufacturers (OEM) get-together line is reached. Likewise, logistics PM must be in tune with the modern day's concepts which is mainly focused on lean logistics.

The performance of GL cannot be dignified merely in an economic way, but also in a sustainable process taking into consideration of environmental and societal factors as well, which is also the objective of GL (Hervani, et. al., 2005). GL can be expressed as the amalgamation of traditional logistics and reverse logistics (RL). Traditional logistics in itself encompasses the drift from the raw materials to finished products, while RL is a relatively new research arena, which includes the notion of reutilizing used products so as to reduce waste and to increase an industry's performance and ensuing profits. RL is of boundless significance, as it not only balances cohesive logistics research, but also develops the

performance of GL significantly relatively to all the economic, environmental and societal objectives Lee & Lam (2012).

The 3PL has been extensively endorsed by the sensation of outsourcing, on which companies progressively rely. Logistics outsourcing evolution is primarily accredited to the benefits it brings, relative to reducing costs, enhancing performance, concentrating on their fundamental business and building effective enterprises through tactical coalitions. Roughly, 60% of the affluence 500 companies in US testified having at least one 3PL contract and that the market for logistics providers continues to develop (Lieb & Bentz, 2005). Most 3PL have isolated their services through diversity, with the range of services covering a diversity of choices ranging from limited services to broad undertakings covering the supply chain.

Theoretical framework

Sustainability Strategy

Environmental management rose to a strategic concern for organizations after the Brundtland Commission Report (Sharma & Vredenburg, 1998). Strategy making is inherently concerned with long-term planning and long-term decision making, and as general awareness of sustainability issues grew, organizations started to realize that by incorporating environmental aspects in the strategy work they may gain long-term advantages in their jurisdictions as well as in other markets (Rao & Holt, 2005). The incorporation of environmental concern in the corporate and business strategies (Bourgeois, 1980) is thus a way to define and manage the interface between the environment and business (Sharma, 2000). In a recent survey, 77 per cent of the respondents claimed environmental issues to be important for the overall strategy of the firm (Eye for Transport, 2009). Sustainability strategies range from conforming to standard industry performance and regulations on the one hand, to voluntary actions for environmental preservations on the other hand (Buysse & Verbeke, 2003; Sharma, 2000). The reactive strategies are usually due to pressure from

industry associations, environmental NGOs, competitors' actions, governmental regulations, and other industry stakeholders, while proactive environmental strategies involve the search for and adoption of innovative technologies that help reduce the emissions (Sharma, 2000). Since both types of sustainability strategies affect the firm's design and control of the supply chain, no distinction has been made between them within this study.

Furthermore, sustainability strategies of an organization could embrace anything from pollution measurement, habitat protection, voluntary restoration, energy and materials substitution to process, and product redesign (Sharma, 2000). In any case, the establishment of an explicit sustainability strategy enables top management to support greening initiatives further down the hierarchy (Min & Galle, 1997). Having this top-management support is instrumental in any change process (Kotter, 1995) and the implementation of several logistics greening measures depends on decisions further up the hierarchy (Aronsson & Huge Brodin, 2006; McKinnon, 2003).

Greening Transport Operations

It was argued by, e.g., Wu and Dunn (1995) that transportation is the "single largest source of environmental hazard in the logistics system". In order to achieve a more environmentally friendly logistics system, they argue, one should thus make logistics decisions that minimize the amount of transport emissions. According to McKinnon (2003), logistics activities can lead to reductions in transport emissions through changes in either the mode of transport, transport demand, or vehicle utilization. Although improvement in any of the aspects would lead to improved environmental performance, the effect on logistics efficiency and logistics effectiveness is not completely clear-cut. For example, regarding the shift in transport mode, it has been shown that the general perception among shippers is that a shift to less polluting

transport modes would lead to a general decrease in logistics performance (Ludvigsen, 1999; Evers et al., 1996).

Similar arguments surround a potential reduction in transport demand. Reduced transport demand is often highlighted as a key to improved environmental performance. In reality this is commonly met by reduced transport frequency or local sourcing, changes that are generally considered more efficient but less effective than the counterpart (e.g. Wu and Dunn, 1995; Cooper et al., 1991). Lastly, improved vehicle utilization is generally considered a good way to align economic and environmental performance, as resources are utilized more efficiently. That is, improving environmental performance in this way is likely to lead to higher efficiency.

Methodology

Study Population and Sampling

The target population for this study is all managers and senior staffs in the selected Malaysian's manufacturing and logistics industry. The overall number of certified organization with MS ISO 14001 in Malaysia as at now is 522 organization, hence, only organizations with ISO 14001 certificates have been selected for this study since it is the only body recognized for controlling and monitoring logistics and supply chain operations and policies in Malaysia. The reason for this decision is because they are set of organization with the mandate to adopt green initiatives in their operations (Eltayeb & Zailani, 2009).

Sample Size

The sample size for this study was adopted from the earlier study, Adebare, Mustakim, & Richard, (2021).

Results and discussion

The respondents profile results is as shown in Table 1.

Table 1 Respondents Profile result

Demographic Info.	Details	Frequency	Percentage (%)
Gender	Male	123	53.7
	Female	106	46.3
Age	18 – 25 years	63	27.5
	26 – 35years	92	40.2
	36 – 45 years	53	23.1
	46 – 55 years	21	9.2
Qualifications	Diploma and Below	59	25.8
	Degree	101	44.1
	Masters	46	20.1
	PhD	23	10.0
Position	Senior Manager/Manager	52	22.7
	Executives	74	32.3
	Supervisor	18	7.9
	Planners	4	1.7
	Others	81	35.4
Services Types	Freight Forwarding	7	3.1
	Transportation	40	17.5
	Warehousing and inventory	18	7.9
	Manufacturing	19	8.3
	Logistics	145	63.3
Ownership Types	Public Liability Company	56	24.5
	Private Liability Company	93	40.6
	Sole Proprietorship	26	11.4
	Partnership	51	22.3
	Limited Liability Partnership	3	1.3
Full time Employees	Below 50 employees	109	47.6
	50 – 99 employees	39	17.0
	100 – 149 employees	15	6.6
	150 – 199 employees	4	1.7
	200 employees and above	62	27.1
Years of Operation	0 – 5 years	62	27.1
	6 – 10 years	83	36.2
	11 – 15 years	4	1.7
	16 – 20 years	11	4.8
	21 years and above	69	30.1
Annual Revenue	Below USD 500k	99	43.2
	USD 500k – 1m	36	15.7
	USD 1.1m – 10m	36	15.7
	USD 10.1m – 50m	14	6.1
	USD 50m and above	44	19.2

The results of the respondent's profile revealed that there are more male than the females. 53.7% of the respondents are male, while female is 46.3%. This may be because most of the

staffs in Logistics companies are more of male counterpart. Another perspective is the age range, the respondents are more of the age range 26-35 years. This category are consider as youthful and working age because of their ability and strength but probably young years of experience. But on the job training and inhouse training would have been their advantages probably. The other age range among the respondents is age 18-25 years, the age range has 27.5% next to the highest range. This are entrance point and age range probably and very young in the business.

Most of the respondents are graduate as the degree holders recorded 44.1% and followed closely by Diploma holders which recorded 25.8%.This is an indication that most of the respondents are graduates, hence, they are aware of what it takes to work in the logistics company and they all have what it takes to be a professionals in the field.. Respondents with Masters and PhD degree recorded 20.1% and 10.0% respectively. This shows that larger percentage of the respondents are qualified and professional. This makes the data more viable and reliable. In term of position, most of the respondents are executives' officers in various organisations. Likewise, about 22.7% of them are Senior Manager/Manager in the various organization. In terms of services rendered by respondents, it is on record that those respondents in Logistics section are 63.3% while those in transportation are 17.5%, those in manufacturing are 8.3%. This indicate that most respondents are quite familiar with logistics and transportation sector which is the main focus of the study. Most of the respondent's company are full time employees that are below 50 employees. And, company with 200 employee and above.

The result of innovation in green logistics of third party Logistics service providers is as shown

Mean and Standard Deviation of Innovation in Green Logistics

The descriptive statistics of the items ES1 – 6, SM1 – 6, GTO1 – 8, and GPT1 – 4 of environmental sustainability, strategic management, green transport operation and green transport procurement respectively as presented in Table 2 revealed the degree of innovation in green logistics thought among the respondents, these items have mean scores above 3. All the twenty-three (23) items were recorded high level of mean score. Specifically, "Consideration for procurement and selection of vehicle types based on cost, quality, and environmental impacts" recorded highest mean score of (M= 3.97; SD = 1.122), while the "Focusing attention on strategic aspects of business" recorded the moderate mean score of (M= 3.72; SD = 1.189). In essence, the result indicates that "Consideration for procurement and selection of vehicle types based on cost, quality, and environmental impacts" is the main feature representing the innovation in green management as shown in Table 2 below.

Table 2
Mean and Standard Deviation of the Innovation in Green Logistics

Constructs	**Mean**	**SD**
Level of environmental compliance	3.77	1.160
The purchased products are friendly to environment and environmental harmful products are avoided	3.75	1.125
The purchased raw material can be reused or recycled	3.76	1.081
The purchased raw material are produced from excess and environmental friendly	3.76	1.148
The computer network is used instead of papers in marketing between vendor and factory	3.80	1.125
Environmental Sustainability		
Learning existing work practices	3.78	1.122
Strategic planning (formulation)	3.80	1.145
Strategy implementation/execution	3.80	1.207
Focusing attention on strategic aspects of business	3.72	1.189
strategic decision making	3.79	1.163
Strategic capabilities	3.97	1.059
Strategic Management		
Managing strategic change	3.89	1.101
The concern on environmental management of provider	3.91	1.082
The concern of carbon dioxide releasing of provider	3.89	1.090
The distance between vendor and factory is minimized in order to reduce pollution and cost	3.87	1.088
The factory is concerned about the fuel consumption in distribution includes measuring the carbon dioxide emission	3.93	1.090

The delivering vehicles are well checked and maintenance plan are available.	3.94	1.091
The full truck load system is applied to increase the effectiveness of product delivering	3.91	1.074
The delivering routes are determined to safe the fuel and reduce the pollution	3.92	1.105
Green Transport Operation		
Consideration for procurement and selection of vehicle types based on cost, quality, and environmental impacts	3.97	1.122
Strategic planning the preventive maintenance of all vehicles	3.90	1.088
The pollution reducing system is paramount in transport procurement	3.86	1.173
The clean energy technologies are applied	3.83	1.175
Green Transport Procurement		

Mean and Standard Deviation of Services Performance

The descriptive statistics of the items SPS1 – 8 and SPA1 – 5 of services and appropriation performance respectively as presented in Table 3 revealed the degree of service performance thought among the respondents, these items have mean scores above 3. All the thirteen (13) items were recorded high level of mean score. Specifically, "The imports shipments are cleared and delivered as scheduled" recorded highest mean score of (M= 4.10; SD = .831), while the "Focusing attention on strategic aspects of business" recorded the moderate mean score of (M= 3.72; SD = 1.189). In essence, the result indicates that "Expedited customs clearance for traders with high compliance levels" is the main feature representing the service performance as shown in Table 3 below.

Table 3
Mean and Standard Deviation of the Service Performance

Constructs	**Mean**	**SD**
The imports shipments are cleared and delivered as scheduled	3.89	1.035
Logistics organization provides adequate services	3.90	1.054
The exports shipments are cleared and delivered appropriately	3.98	1.061
Timely and adequate information received when any regulations and government policy changes	3.97	1.084
Demonstrating high levels of compliances by expedited	3.92	1.085

clearance		
Standard inspection of all services	3.90	1.068
Less damaged and Lost of freight	3.93	1.118
Evaluating performance	3.96	1.038
Services		
All consignment reaches the consignee at the appropriate time and promptly	3.93	1.120
All order placement as well as the receipt are within stipulated time	3.90	1.120
All clearance and delivery of exports and imports are to schedule	3.94	1.110
Adequate and timely information on regulatory changes	3.96	1.127
Expedited customs clearance for traders with high compliance levels	4.10	.831
Appropriation		

Mean and Standard Deviation of Operational Performance

The descriptive statistics of the items OPS1 – 3 and OPT1 – 3 of shipment and tracking and tracing of goods respectively as presented in Table 4 revealed the degree of operational performance thought among the respondents, these items have mean scores above 3. All the six (6) items were recorded high level of mean score. Specifically, "Competitive trucking charges" recorded highest mean score of (M= 4.23; SD = .961), while the "Low operating cost and maintenance cost" recorded the moderate mean score of (M= 3.98; SD = .898). In essence, the result indicates that "Competitive trucking charges" is the main feature representing the operational performance as shown in Table 4.

Table 4
Mean and Standard Deviation of the Operational Performance

Constructs	**Mean**	**SD**
Competitive trucking charges	4.23	.961
Competitive trans-loading facility charges	4.12	.929
Low operating cost and maintenance cost	3.98	.878
Shipment		
Consignments are easily trace and tracked	4.10	.917
Short time for customer to respond	4.16	.942
Detailed information and timing about the location of the consignment	4.20	.899

Conclusion

Thus, the influence of the four independent variables (transportation, warehousing, packaging and inventory management) are essential in creating positive impact on third party logistics service performance, which consists of service, operation and financial performance. In an increasing competitive business environment, the role of innovation in green logistics as a moderating effect is important in creating alignment between those independent variables and third-party logistics service performance in order to ensure logistic and supply chain procurement function stays in tag with purchasers and objective. This research study indicates that there is a connection between several relationship of innovative green logistics service dimensions and the level of performance for the relationship. The findings able to offer support for the value of relationship of innovative green logistics within third party logistics industry practices. This research study may also reveal that innovation in green logistics in the area of environmental sustainability and strategic management play major role in 3PL performance in Malaysia. The framework of this study was designed based on the existing literature reviewed hence, the constructs such as: transportation, warehousing, packaging and inventory management and innovation in green management influence were proved.

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