

Comment: The Current Challenges and Future of Logistics

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ABSTRACT

Logistics has been evolving by facing challenges and adopting innovation. This comment paper provides a better understanding about what will be logistical challenges in the future and how the future logistics industry will be reshaped by these challenges. The future logistics market is expected to offer great benefits for the society, for industry, for each logistics service provider, for all stakeholders, and ultimately for shippers. In the future, the logistics industry needs to design for additional parameters such as carbon emission reduction, reduced fuel consumption, lower traffic congestion, higher visibility on the cargo and information, enhanced collaboration, shared physical distribution, identifying sourcing issues, and increased logistics innovation.

Keywords: Logistics, logistical challenges, future logistics, future supply chains

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1. Introduction

Logistics has been evolving by facing challenges and adopting innovation. Historically, efficiency and effectiveness of transport have leaped by the advent of innovative ideas, such as Hanseatic League, steam engines, containerisation and lean thinking (DHL, 2016). From a customer's perspective, logistics quality is divided into market qualifiers and order winners (Hill, 1993). The former makes the logistics survive in the market whilst the latter enables the logistics to win customer orders. Market qualifiers and winners are not static but ever changing; today's order winners become tomorrow's market qualifiers. For instance, door-to-door service of shipping companies was once a market winner, but now became a norm. Trace and tracking service saw the same destiny. Hence, logistics companies as well as any companies involved in logistics should be aware of the expectations from the market in order to successfully identify and adopt the order winners; this is the only way to survive in the near future. Moreover, in consideration of the accelerated pace of changes, forecasting future logistics trends and preparing for them will be a pre-requisite for maintaining a competitive advantage of a firm.

The term, logistics, was recognised as a military term before 1950s. It was concerned with maintenance, procurement and transport of military material, facilities, equipment and personnel. By that time, the enterprises were not aware of the importance of logistics and their departments of marketing, production and finance were fragmented with diverging aims (Ballou, 2007). This causes conflicts between logistics activities and firms' stance because of inertia of traditional way of business, a lack of comprehensive understanding of key cost trade-off, and focus on more important areas than logistics. After a decade later, firms start recognise the importance of logistics as a major means of reducing costs, which can be seen as another competitive advantage. The firms can benefit from converging their interests in logistics in several ways. Firstly, they reduced total costs by calculating the trade-off relationships between efficient logistics systems and other activities. Secondly, they changed the firm structure that effectively controls logistics. Thirdly, top management started recognising that logistics is final areas for reducing costs. Logistics became more integrated not just within an organisation but also with suppliers and customers.

It is evident that logistics is a drastically evolving market. Recent rise of Asia, especially China, and globalisation have changed the perception of manufacturers, retailers and investors, as they have noticed that global logistics networks are needed to underpin their effective global supply chains. Hence, the role of logistics service providers (LSPs) is getting salient. Uncertain global economy makes the LSPs attuned and responsive to macro environmental changes. The complexities and uncertainties inherent to global supply chains required LSPs to be more resilient by equipping greater visibility and flexibility within their operations. The emergence of information and communication technology (ICT) provided a solution to enabling firms to get a real-time access to the information from remote places thus to be more responsive to disturbances and disruptions in logistics. Logistics evolution has been achieved by effectively addressing logistical challenges in order to satisfy customer needs.

Recently, McKinsey (2015) revealed the megatrends that will have influences

on logistics and supply chain management in the future global market. These encompass shifting growth patterns due to mega cities and new trade routes, shared transportation, the expansion of digital frontiers, the fiercer race for efficiency, rules and regulations to foster growth and competition, bigger organisations with M&A or partnerships and the increased turbulence due to interdependence and complexities. In addition to these, the new trend of industry 4.0 and smart factories are expected to change the shapes of logistics. The overwhelming amount of information to be generated by internet of things (IoT) will be both opportunities and threats to LSPs because a successful big data analysis and its application will decide a firm's sustainable advantages in the future market.

In these circumstances, it is imperative to understand what will be logistical challenges in the future and how the future logistics industry will be reshaped by these challenges. This article aims to cover these two questions in the following sections.

2. Logistical Challenges due to environmental changes

When forecasting the future, it is inevitable that many external environments or trends which cannot be controlled by a certain industry shape the industry. Hence, this article takes account for the external changes as well as internal or technical changes. The rapid changes of world may lead to the logistical challenges. Such challenges chiefly incorporate environmental concerns and sustainability, demanding customer expectations, and risk and complexity. This section aims to reveal the challenges owing to the environmental changes in the world.

• *Environmental Concerns and Sustainability*

Environmental issues and sustainability are a key consideration for future logistics, because transportation accounts for approximately 13 percent of world carbon emissions. Climate changes also will obtain urgency. A number of regulations e.g. Kyoto Protocol (Dec 1997), United Nations Climate Meeting, Bali (Dec 2007), Carbon Disclose Project, EU Directive on Renewable Energy (Jan 2008), and United Nations Framework Convention on Climate Change (Dec 2009) have attempted to address sustainability issues (GCI, 2008). Nowadays, firms have no option but to conduct in the most environmentally sustainable way possible, because legislation is rapidly driven that way. In 2007, The EU positioned a target of twenty percent green energy usage by 2020, whilst developing countries attempt to meet a certain standard (e.g. China decided the target of twenty percent of its energy capacity from renewable energy by 2020) (SMI, 2016). In a logistical viewpoint, from April 2013, all transport companies in EU have to comply with the EU policy, which claims that they must incorporate carbon emissions data in their annual report (Lombard, 2016). On top of that, they should measure carbon output and uncover it to customers if necessary. Tracking carbon emission might be a relatively simple task compared to next issue. Probably, LSPs are required to document all types of negative impacts of transportation

such as nitrogen oxide and noise so as to quantify the comprehensive impact of their transportation operations in the more distant future. Also, it should be noted that the customers may be attracted to the firms that are operated in an environmental-friendly responsible fashion in the future.

A recent Delphi survey reveals that experts see a notable growth in renewables, whilst they do not believe that a major energy is replaced by 2030 (SMI, 2016). Nonetheless, it is strongly argued that the world will find a solution to drive significant technological changes in this area by setting new regulations in a growing number of countries or in supra-international bodies. In the LSPs' stance, it might be likely that the reduction of carbon emissions is a bigger challenge over the next two decades than acquiring a sufficient supply of energy (SMI, 2016).

• *Demanding Customer Expectations*

LSPs suffer pressures of demanding customer expectation. In particular, customers demand on time delivery and guaranteed delivery date. This forces the LSPs to acquire higher predictability, agility, and flexibility. Furthermore, customer expectation pertaining to the visibility of logistics flows is heightened. Indeed, customers demand more accurate real-time information at their fingertips, implying that LSPs need to proactively utilise integrated ICT systems. Meeting such expectation is not an easy task to LSPs. It is attributed to a fact that the customers do not only demand aforementioned services, but also expect the same or reasonably low price. It is well known that the achieving cost and differentiation strategy at the same time is extremely tough.

Furthermore, the customers will have growing emphasis on green logistics and corporate social responsibility. More environmentally concerned consumers will prefer locally produced products, giving propagation to regionalisation of supply chains, and they would like to involve in control over the logistics process. It may be likely that this tremendously intervene or hinder the effective logistics process.

• *Increasing Risks and Complexities*

Risks and complexities also significantly reform the logistics and supply chain trends (Lee, Seo, and Dinwoodie, 2016; Kwak, Seo, and Mason, 2015) Political instability, terrorism and natural disasters cause global shippers' concern in regard to the buffering stocks against above risks. For instance, tsunami and earthquake in Japan in 2011 force automotive manufacturers to close their plants. This example typically shows that even the large enterprise (multi-national enterprise) is sometimes vulnerable to such risk. Thus, logistics managers require re-thinking redundancy built in and contingency planning. In fact, they are required to possess proper risk management capabilities to cope with the unexpected crisis. In this regard, LSPs are putting more efforts on collaboration with the shippers so as to handle the demand fluctuation via joint planning, execution and monitoring.

Oil price volatility can be regarded as another complex issue, even though recent media points out that oil prices are not likely to rise due to the over-supply from

OPEC countries and shale oil from United States. However, if the oil price becomes very expensive (e.g. four digit figure), it is likely that the proliferation of regionalisation of supply chains and production sites' relocation are unavoidable. Furthermore, the oil price may decline the growth of world economy and development, so such a slow global growth will have a negative impact on the demand for international logistics. Moreover, manufacturers will re-examine current locations of production sites in the developing countries in which the labour cost is cheap, as the current operation may be detrimental to their profits due to the high oil prices. On the other hand, should the oil price remain in the three digit figure range, global sourcing and logistics are still dominant to offer reasonable transport costs (SML, 2016). Therefore, the LSPs will need to reduce future risks by identifying alternative use of energy or reducing their reliance only on oil. More fuel-efficient vehicles and equipment would also be beneficial to them.

3. Future Logistics

Often, it is argued that LSPs do not only have a few opportunities to differentiate their services, but also have a difficulty in power game with large shippers who keep asking lower rates. Nevertheless, there will be a room for them to differentiate themselves over rivals, at the same time pursuing lowest costs and efficient logistics operations. In the future, the LSPs may simultaneously achieve both cost and differentiation advantage by adopting following ways: (1) enhanced collaboration; (2) shared physical distribution; (3) identifying sourcing issues; and (4) logistics innovation.

3.1 *Enhanced Collaboration*

LSPs are required to collaborate with customers and with each other so as to shape the optimum supply chains, since a future logistics model may be based on multi-partner information sharing amongst various stakeholders such as customers, suppliers, manufacturers, retailers and LSPs. Here, information sharing amongst them is of paramount importance. Enhancing such collaboration via information sharing requires a new way of working together across the supply chains. With an emphasis of the integrated information technology (IT), the accumulated data can be used for a big data analysis, which helps the LSPs to implement an accurate forecast in customers' demands. It helps to satisfy the demanding customers' needs which are highlighted in the previous section, but also reduce the risks that are stressed in the prior section by preparing their services in peak times based on the customers' patterns.

In addition, today's LSPs are obsessed with the customer's demand with service-driven orientation. If the customer asks them to deliver goods to 'Hong Kong, tomorrow', they immediately identify air transport. However, in the near future, this aspect may be completely different from today. They may ask the customer as to why this transportation should be done by tomorrow. Instead, the logistics managers

may suggest the better logistics planning, which fits with the customers' business patterns. By doing so, the customers are able to save the cost and maintain the appropriate level of stocks. Hence, the collaboration between the LSPs and customer (shippers) can be seen as a win-win strategy for the future.

3.2 Shared Physical Distribution (Shared Transport, Shared Warehouse, Shared Distribution Centre and Shared Infrastructure)

A large number of companies in developed countries have adopted the concept of shared physical distribution. Once manufacturers produce the goods, the goods are delivered to collaborative warehouse where a diverse range of the manufacturers keep the goods. Then, collaborative transport is undertaken via shared load planning and truck capacity from the collaborative warehouse to regional distribution centres (shared distribution centres). In general, the warehouse may be located in the edge of cities in the urban areas, whilst it can be found at the regional distribution centres in the rural area. Next, final delivery is taking place by consolidated deliveries using state-of-the-art equipment and vehicles. For instance, ECR Europe has initiated collaborative physical logistics with the aim of helping to lower the negative environmental impact of transport and save the cost. It can be argued that this strategy is very effective to save the fuel costs of vehicles regardless of aforementioned oil price volatility, whilst it is helpful to afore-stated sustainability issue.

3.3 Identifying Sourcing Issues

In some developed countries, people pursue the sustainable local supplies wherever possible in order to reduce the sourcing distances. In other words, they are more likely to make more sustainable purchase decisions. This issue is related to sustainability which is described in the previous section. The LSPs will need to understand the customers' sourcing preference in the future. This may include their main customers (manufacturers or shippers) and final customers of goods in order to quickly respond to the changes of transport demands. If the LSPs comprehensively understand this phenomenon in advance, they are more likely to invest their assets such as distribution centres, warehouses, and facilities for value-added services (e.g. packing and labelling) in the right place at the right time.

In addition, as LSPs' future strategy, they should rigorously observe how the manufacturers' sourcing strategies are evolving over times, because this may significantly affect the demands for transportation and transport geography. No matter what strategies the manufacturers use for sourcing, it is apparent that lowering costs and enhancing efficiency by re-examining the location of production sites will be a major issue to remain competitive in the future. Therefore, identifying their behaviours in advance or in the right time can provide LSPs with a source of competitiveness.

3.4 Logistics Innovation

The salience of technology to LSPs cannot be overstated. For future LSPs, the pathway to profitability may lie with logistics innovation, which can be categorised into process innovation and technology innovation (Kwak, Seo, and Mason, 2015; Seo, Dinwoodie, and Kwak, 2014). These two innovation approaches can minimise the errors and differentiate the logistical capability, improving customer satisfaction. Small upfront investment onto these innovation can provide integrated additional services during warehouse management, consolidation, distribution, and handling and receiving of goods.

Technology innovation aims to enhance the integrated information system, real-time tracking technology and innovative logistics equipment across global supply chains so that it provides cutting-edge and real-time information, reduced inventory cost and high quality logistics services. It is a key variable and the means of differentiation for logistics intermediaries. The application of contemporary technologies such as GPS, RFID and ERP can effectively support risk management in global logistics practices. In the future, the range of usage of further advanced technologies such as Real-Time Locating Service (RTLS), Optical Character Reader (OCR), and Global Navigation Satellite System (GNSS) would be enlarged. Technology innovation plays an important role in exploiting economies of scale in purchasing, logistics and central distribution centres. Technology innovation helps firms to heighten labour and capital productivity and offer real-time visibility regarding the flow of cargoes and information and sales data so that firms can enhance inventory management, enlarge value proposition for final customers, and obtain an ability to rapidly respond to abnormal circumstances. Numerous technology innovations derived from technological experimentation, whilst the greater efforts aiming at improving customer value result in process (service) innovation such as agile and responsive processes against changes and creative service in the global supply chains. In addition, via the technology innovation, the LSPs may conduct big data analysis combining with logistical data. The data are accumulated by integrating the information via RFID or Electronic On-Board Recorder (EOBR) equipped in the trailer, truck, vessels and so on. As a result, they can apply such analysis into the logistics planning, performance measurement and risk management. Big data may simultaneously provide the LSPs, shippers and manufacturers with competitiveness, since they can control their human resources and assets with higher visibility, which is derived from the big data analysis. Besides, they are able to make effective strategies by grasping the customers' patterns and quickly respond to the changes of supply and demand.

Process innovation is concerned with the effective re-design and re-engineering of the logistics system. Wagner (2008, p. 222) noted that "a process innovation is the implementation of new or improved techniques, methods and procedures with the goal to continually improve the quality of a service or reduce the cost of providing a service". In terms of process innovation, by understanding how the LSPs in the supply chains transfers innovation as well as knowledge, meaningful process innovations and ultimate value for better services can be stimulated. It focuses on operational issues and processes that enhance management practices, networking, distribution,

procurement and so on.

4. Concluding Remarks

The future logistics market is expected to offer great benefits for the society, for industry, for each LSP, for all stakeholders, and ultimately for shippers. Current logistics managers primarily aim to lower logistics costs, enhance logistics performance, and yield sound financial figures. Some LSPs may consider themselves as low-cost logistics providers, where the customers select them due to primarily cheap rates, whilst other LSPs put their position into innovative logistics providers equipped with cutting-edge technology to provide highly sophisticated real-time control of the cargoes' flows. In the future, the logistics industry should design for additional parameters such as carbon emission reduction, reduced fuel consumption, lower traffic congestion, higher visibility on the cargo and information, enhanced collaboration, shared physical distribution, identifying sourcing issues, and increased logistics innovation. The influence of such parameters are getting more important in the coming years than today. Logistics managers may need to plan the strategies based on the priority to these parameters. Consumer demand and awareness for these new parameters to employ new practices might be another source of competitive advantage. Furthermore, it should be noted that using a big data analysis based on accumulated data through the integrated IT system amongst various stakeholders is of paramount importance. By doing so, the LSPs are able to set a feasible and accurate plan so that they can reduce the risks involved and respond to expected demand in advance. It is also a core determinant factor to satisfy their customers by having robustness and resilience in response to any upcoming unexpected events.

The logistics managers should possess the insights into the development of future logistics that effectively responds to and satisfy tomorrow's customers in a sustainable and green way. They must not only pursue the efficiency, but also understand the potential of logistics innovation and collaboration. Finally, it should be noted that to effectively prepare the future logistics, logistics industry has to consider how to attract more trained and intelligent staff. It is important to appropriately train and develop the staff's capability to absorb, diffuse, and apply such logistics innovation into the real logistics operations. On top of that, the government may able to encourage intelligent young generations to enter the logistics industry by setting a decent logistical training programme. It does not only include basic knowledge regarding logistics but also help them to deal with aforementioned future logistical trends in advance in order to heighten the competitiveness of the logistics industry.

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