ISBN 978-93-5156-328-0
International Conference of Advance Research and Innovation (ICARI-2015)

Study of Best Practices and Challenges for Logistics Providers in India

Anchal Gupta [a], Rajesh K. Singh [b], P. K. Suri [c]
[a] Apeejay School of Management, Dwarka, New Delhi, India
[b] Department of Mechanical and Production Engineering, Delhi Technological University, New Delhi, India
[c] Delhi School of Management, Delhi Technological University, Delhi, India

Article Info
Article history:
Received 8 January 2015
Received in revised form
15 January 2015
Accepted 22 January 2015
Available online 31 January 2015

Keywords
Logistics Service Providers (LSPs),
Third Party Logistics Providers (3PLs),
Best Practices,
Opportunities,
Challenges,
India

Abstract

In today's cut throat competition when organizations are competing for survival, firms need to focus more on their core competencies and deliver quick and efficient response to demands arising from the market. The firms usually practice outsourcing of various non core activities like transportation, warehousing, order fulfilment, value added services, etc. to remain focussed to their core areas. The outsourcing part is now transformed into fully integrated logistics solutions and well taken care by Logistics Service Providers (LSPs) by providing the benefits of reduced cost, timely delivery and increased efficiency of supply chain. India spent around 14 per cent of its GDP on logistics in 2014 and experts believe that India's logistics sector would grow at fast rate and expected to create worth of $385 bn by 2015. Many industries like Automobile, Electronics, FMCG, Pharma and food processing apart from agricultural sector also take support from third party logistics providers (3PLs) for smoothening up their relationship with supply chain partners, optimizing their scarce resources and improving customer satisfaction in terms of timely and quality delivery. The objective of this paper is to highlight the best practices provided by LSPs to serve end users in the form of one stop solution comprising of bulk procurement, accurate order processing to inbound/outbound transportation, efficient warehousing operations, fleet management, speedy on-time delivery services, etc. This paper also aims to identify the opportunities and challenges which come across logistics providers. Increased impact of globalization, wide use of IT, expansion of business through e-commerce, and logistics alliances can be upcoming opportunities for further enhancing the scope. Some challenges like inadequate and inefficient infrastructure, behavioural complexities, rising competition and unrealistic expectations of end users, need to be overcome for betterment of logistics operations.

1. Introduction

In order to respond faster to market demands and to focus more on core competencies, outsourcing of logistics operations can become a key to survival and success for organizations in cut throat competition. The outsourcing part is now transformed into fully integrated logistics solutions and well taken care by Logistics Service Providers (LSPs) by providing the benefits of reduced cost, timely delivery and increased efficiency of supply chain. Logistics cost is 14% of the GDP of India. India is also ranked 46th in the logistics performance index among 155 countries (LPI Survey, World Bank, 2012). Third Party Logistics providers (3PLs), also referred to as logistics outsourcing or contract logistics but actually this service is something more than outsourcing or subcontracting (Marasco, 2008). Mostly outsourcing or subcontracting deals with a single product or for a single function or with a single vendor whereas 3PLs provides multiple logistics functions for multiple products to multiple vendors simultaneously (Tan et al., 2014). The functions of logistics providers is not limited to bulk procurement, inbound and outbound transportation, order processing, warehousing, fleet management, shipment consolidation, distribution network optimization, value added services and speedy on-time delivery to the end users. Now, logistics providers are just not performing simple supply chain operations but also play a very significant role in supply chain integration by facilitating collaboration among all supply chain partners (Kumar et al., 2012).Moreover, use of information technology enhance accurate and effective coordination between all parties involved and also has direct impact on efficiency of supply chain performance by tracing and tracking shipments easily.

The role of logistics service providers is very essential in conducting smooth flow of material and information in both upstream and downstream of supply chain. The contribution of 3PLs services are increased to a big extent due to its direct and indirect benefits throughout the world. In global scenario, from more than two decades, the firms are supported by logistics providers for the benefits of cost reduction, better service quality and speedy delivery. Sometimes, lack of internal capability and need of flexibility becomes main reason for outsourcing their logistics activities. According to Sahay et al. (2006), the major reasons for usage of 3PL services in India include- cost reduction (27%), strategic reasons (26%), process effectiveness (24%) and lack of internal capability (11%). Many best practices followed by organizations become an important reason of wide adoption of logistics services provided by LSPs (Table I). Channel partnering, route optimization, supply chain integration, concern towards environment i.e green and reverse logistics, advancement in

Corresponding Author,
E-mail address: anchal.gupta1503@gmail.com

information technology, resource optimization and flexibility in service are few to name.

Most manufacturing industries like automobile, electronics, cement, processed foods, oil & gas and FMCG apart from agriculture need multimodal transport services to serve wide customer base with limited production base. Many firms are dependent on logistics providers for their warehousing activities, wide geographical coverage, developed IT solutions and strong network. Transportation activities (61.8%) is considered to be the most important logistic function for all the industries, followed by freight forwarding (25.7%), warehousing (8.3%) and VALS (4.1%) (Source: http://www.frost.com). According to CMIE Prowess Database (Centre for Monitoring Indian Economy), a huge list of around 350 firms involved in business of logistics service is available, specifying details of LSPs and also the information about the different market segments and industries catered by them.

The categorization between various logistics providers are done on the basis of selected industry, targeted market and product differentiation. The Indian logistics service providers are now providing their services are Shipping Corporation of India, Container Corporation of India, Transport Corporation of India, Om Logistics, Safe express etc. The International service providers are Schenker, DHL (Blue Dart) TNT etc. As for instance, Om logistics, well-recognised LSPs from 1980s, has their core competence in serving automobile and electronics sector. Similarly, Blue dart is known for their competence in providing courier and ODC (Over dimensional cargo) services in air mode (they have their fleet of own crafts). Likewise, Retail sector distribution is efficiently managed by Safe Express and Gati, well-known brands in logistics sector.

The selection of 3PL is done on various criteria decided by the shipper and performance is always evaluated to decide upon the continuity of business and to acknowledge the fulfilment of promised expectations. When selecting a 3PL for their non- core activities, firms usually give more importance to few criteria like logistics cost, service quality, compatibility with user, consignment tracking capability, total revenue, geographical coverage, information systems and on-time delivery(Kumar et al.,2012).Firms are also interested in evaluating performance of logistics providers to ensure efficient and value added contribution for betterment.

The objective of the paper is to highlight the best practices adopted by logistics providers in order to serve end user with quality service. This paper also aims to identify opportunities and challenges come across in the path of logistics provider. The reminder parts of the paper are organised as follows: Section 2 explores the literature review. Section 3 discusses the best practices followed by Indian logistics providers. Section 4 outlines the opportunities and challenges faced by 3PLs and Section 5 concludes and summarizes the paper.

2. Literature Review

From last three decades, many researches has been done on logistics providers and logistical services provided by LSPs. Marasco (2008) analysed 152 articles published from 1989 to 2006 in 33 international journals. Busse and Wallenburg, (2011) provided comprehensive review of innovation practices of logistics management from 2001 to 2009. In general, outsourcing refers to giving some part of business to third party for the benefit of cost reduction and better customer services. Nowadays, Third party logistics (3PLs) become more important for logistics sector. There are different definitions of 3PLs, exist in literature. Traditionally, it is defined as "the use of external companies to perform logistics functions that have traditionally being performed within an organization", (Lieb, 1992). LSPs are "Companies which perform logistics activities on behalf of others" as stated by (Delfmann et al., 2002). According to Jiang et al. (2014), the 3PL provider is an external provider who manages, controls and delivers logistics services on the behalf of a shipper. According to our understanding, 3PL is just not only handling day to day logistical transactions but simultaneously, responsible for effective supply chain integration and increased supply chain profitability.

Tezuka (2011) highlights the three characteristics of service provider as integrated, contract and consulting service providers. Different authors analysed 3PL businesses, their categorization, structure and services on the basis of different types of industry they served. According to Hertz et al. (2003), LSPs serve multiple roles as a service developer, customer developer and customer adapter altogether. Some logistics providers have their own assets like fleet or warehouses to support organizations, generally called as "asset type" or if they do not have sufficient resources of their own to satisfy organizations then they termed as "non- asset type" (Tezuka, 2011).

LSPs services are extended from transportation and warehousing into integrated logistics solutions in form of all shopping at one stop (Kumar et al., 2012). Sahay et al. (2006) found that the common logistics services in India are inbound and outbound transportation, warehousing activities, order fulfilment and fleet management. Gilaninia et al. (2011) and Fasanghari et al. (2008) highlighted the importance of information technology in effective coordination among all supply chain partners. Supply chain integration being an important component for increasing effectiveness and profitability of LSPs is discussed by many authors (Jayaram et al. (2010); Huang et al., 2014) Declining margins and a tougher competitive environment together are the main driving factors for the growth of 3PL (Tan et. al). Flexibility in service (Naim et. al, 2010), value added services (Soinio et al., 2012), optimal delivery time (Ulku and Bookbinber, 2012) and network optimization (Basligil et al., 2011) are also found most frequently used outsourced logistics functions. Many studies exist in literature on latest logistics practices like innovation management (Busse and Wallenburg, 2011), green supply chain() and reverse logistics(Govindan et al.,2012).

Globalization has been a major reason for organizations to redesign their strategies, develop products to meet international market needs and enhance capability to reach globally (Kumar et al., 2012). This requirement gives full opportunity to logistics providers to come up with wide market reach and better connectivity with other nations. Many developed countries are in phase of well-established logistics providers handling all non-core activities whereas few are still in infancy phase (Tan et. al, 2014). Bhatnagar et al. (1999) have analysed that more than 50% of firms outsource shipment consolidation to logistics

providers whereas around 40% outsourced order fulfilment, carrier selection and freight payment in Singapore. Logistics outsourcing practices are comparatively slower in North America and Latin America than Asia-Pacific Region and Western Europe (Kumar et al., 2012).

The firms need to be very critical when they are selecting logistics provider. The firms clearly define criteria for selection and future expectations from the provider. Aghazadeh (2003) provided a optimal solution for choosing a third party logistic provider in simple five step process. The firms indicate their interest in evaluating LSPs performance for future business continuity (Kayakutlu and Buyukozkan, 2011). Kumar et.al (2012) discussed the methods for performance evaluation of logistics providers on various parameters. Many mathematical models and techniques are discussed in literature to support efficiency analysis and performance measurement of LSPs. (Marco et al., 2014 ; Huang et al., 2014; Kumar et al., 2012; Rajesh et al. (2012) Kayakutlu et al., 2011; Hamdan et al. 2007).

In this paper, best practices followed by LSPs are identified from literature and summarized below in Table I.

Table: 1. Best Practices followed by LSPs

S. No	Best Practices followed by LSPs	Source
1	Cost Reduction	Marco et al. (2014), Wong et al. (2010), Kumar et al. (2012), Tan et al. (2014), Sahay et al.(2006), Tezuka (2011), Busse et al. (2011)
2	Resource Optimization(Facility, Fleet & Manpower)	Naim et al. (2010), Jayaram et al. (2010), Sahay et al. (2006), Tezuka (2011), Aghazadeh (2003), Forslund (2012)
3	Advanced IT Support	Wong et al. (2010), Sakun (2011), Tezuka (2011), Fasanghari et al. (2008), Gilaninia et al. (2011), Evangelista et al. (2013)
4	Wide geographical/market coverage	Wong et al. (2010), Kayakutlu et al. (2011), Gilaninia et al. (2011), Soinio et al. (2012)
5	Supply chain Integration	Jiang et al. (2014), Huang et al. (2014), Sakun (2011), Jayaram et al. (2010), Tezuka (2011), Gilaninia et al. (2011), Evangelista et al. (2013)
6	Relationship Building	Huang et al. (2014), Wong et al. (2010), Jayaram et al. (2010), Tezuka (2011), Hertz et al. (2003)
7	Warehousing& Value added Activities	Hamdan et al. (2008), Tan et al. (2014), Basligil et al. (2011), Sahay et al. (2006), Aghazadeh (2003), Soinio et al. (2012)
8	Improved Customer Service/Satisfaction	Sahay et al. (2006), Ellinger et al. (2008), Hertz et al. (2003), Busse et al. (2011), Soinio et al. (2012), Rajesh et al. (2012)
9	Flexibility in service	Huang et al. (2014), Naim et al. (2010), Kumar et al. (2012), Millen et al. (1998), Soinio et al. (2012)
10	Reduction in Lead time	Kumar et al. (2012), Zapfel et al. (2002), Hertz et al. (2003)
11	On-time and accurate delivery	Kumar et al. (2012), Sahay et al. (2006), Busse et al. (2011), Millen et al. (1998), Ulku et al. (2012)
12	One stop solution	Marasco (2008)
13	Distribution network optimization	Basligil et al. (2011), Sahay et al. (2006), Zapfel et al. (2002), Ellinger et al. (2008)
14	Career selection	Boyson et al. (1999), Ulku et al. (2012)
15	Rate negotiations	Boyson et al. (1999), Sahay et al. (2006)
16	Shipment Planning (Routing & allocation)	Basligil et al. (2011), Zapfel et al. (2002), Ellinger et al. (2008), Ulku et al. (2012)
17	Searching ability	Tezuka(2011)
18	Bulk procurement	Kumar et al. (2012), Sahay et al. (2006)
19	Handling environmental uncertainity	Huang et al. (2014), Naim et al. (2010), Tezuka (2011), Ulku et al. (2012)
20	Service Quality	Kayakutlu et al. (2011), Kumar et al. (2012), Sahay et al. (2006), Busse et al. (2011)
21	Order fulfilment	Kumar et al. (2012), Boyson et al. (1999), Basligil et al. (2011), Sahay et al .(2006)
22	Product Returns(Reverse Logistics)	Sahay et al. (2006), Govindan et al. (2012)
23	Globalization	Busse et al. (2011), Hertz et al. (2003)

3. Best Practices followed by Logistics Providers-

Most commonly used best practices are selected from the above table after discussing with experts from both academia and corporates. The selected best practices followed by logistics providers are discussed in detail in this section-

1. **Cost Reduction-** The main objective of any organization is of cost reduction when they outsource their logistics activities. LSPs serve multiple customers simultaneously with almost same requirement of resources. High volume procurement, bulk transportation by their own fleets, huge storage capacity and wide distribution network support them to provide services at reduced cost, as per the concept of economies of scale.
2. **Resource Optimization-** The logistics providers gives an opportunity to organizations to save their

investment on resources required for their logistical movements. Generally, the facility of warehouses, the fleets needed for to and fro activities, the manpower required for loading and unloading of goods and the IT support required for tracing and tracking movement of goods etc. are provided by LSPs (Sahay and Mohan, 2006). This becomes win-win situation for both parties, as firms can save direct investment and further maintenance of resources and 3PLs can make their profit margin by sharing common resources among many firms.

3. **Advanced IT Support-** Each and every organization is making use of IT applications for sharing, processing and retrieving information within and across organizational boundaries. Nowadays, LSPs are well equipped with advanced and updated IT tools and they support their clients by delivering accurate and timely information about the movement of shipments. Latest systems like Enterprise Resource Planning (ERP), Electronic Data Interchange (EDI), Warehouse Management Systems (WMS), Radio Frequency Identification Device (RFID), GPS (Geographical Positioning Systems) etc. enables service providers to streamline their processes and can result in more satisfied customers.
4. **Wide geographical coverage-** The LSP, being an external service provider manages controls and delivers shipments to various destinations on the behalf of a shipper. For a firm, it may be difficult to establish or expand business in an unknown region or country but with the backup of logistics provider, they can extend their market coverage to wide geographical regions. Lack of specific knowledge of customs, tax regulations and infrastructure issues of destination countries have pressurised firms to acquire expertise of 3PL service providers.(Kumar et al., 2012) Wide market coverage by LSPs provides an opportunity to firm to enhance their businesses and can meet arising demands of markets even globally.
5. **Supply Chain Integration-** It refers to coordination mechanisms in the form of business processes that should be streamlined and interconnected both within and outside company boundaries (Romano, 2003). LSPs assist in integrating all supply chain partners in a cooperative manner to arrive at mutually acceptable outcomes. They also build relationship among all separate parties and they work together to achieve a common goal of maximizing supply chain profitability. The healthy relationship between channel partners can enhance information and resource sharing which can reduce bull whip effect also.
6. **Warehousing and Value added activities-** Firms also take advantage of storing their goods at service providers' warehouses. LSPs conduct various value added activities like packaging/ labelling/ marking of products for safe and secure delivery of goods. Many processes like sorting/ splitting/ consolidation are also done at warehouses for efficient and accurate shipments at desired destinations.
7. **Improved Customer Service–** Any company or LSPs are working for a common goal of serving end user in effective and efficient manner. LSPs usually provide door to door services, integrated logistics solution and provision of one stop shop. Additionally, customer can trace and track the exact location of shipment and can know the current status of product due to advanced IT tools. The transparency in entire process and involvement of customer at all stages resulted in more satisfied customers from service of LSPs.
8. **Flexibility in Service–** Flexibility and uncertainty are linked in supply chain (Naim et al., 2010). There is need of flexibility in varying sizes and duration of shipment under unstable and uncertain environment. LSPs can be flexible in their product delivery processes as well as can provide flexibility in transport. The service provider has ability to link with other providers to meet uncertainties in demand and deliver required goods to customers without any delay.
9. **Reduction in Lead Time-** The concept like VMI (Vendor Managed Inventory) and further facilitated by better logistics services, reduced the lead time of any product.

   The gap between when one orders and receives is usually known as lead time but in today's world definition is extended to meeting up the expectations at urgent basis.

   Timely order fulfilment, less delay in shipment and accurate update about movement of materials has supported in reducing lead time of products.
10. **On-time and Accurate Delivery-** There is need to have good coordination among all supply chain partners to provide materials on time. Due to infrastructure issues and long geographical distances, it is very difficult to supply shipments on predefined delivery schedule but still LSPs makes all effort to fulfil their promise of on-time and accurate delivery to customers.
11. **Distribution network Optimization-** The decision or planning of all routes, nodes and hubs through which shipment moves is termed as distribution network. With increasing complexities in transport network, LSPs designs route planning, scheduling and allocation of fleets, channel management etc. for timely delivery and better utilization of available resources. Companies as well as LSPs use hub and spoke concept to deliver goods for more speedy and customized services (Zapfel et al., 2002).
12. **Service Quality-** It involves accuracy in order processing, frequency of correct delivery to defined destination, frequency or loss of damage, customer complaint handling etc. In simple words, the satisfaction level of customers from the services provided by LSPs can be termed as service quality. Service quality can be treated as important factor for evaluating the performance of 3PL. In today's business environment, customer satisfaction is at prime priority for all organizations so all are working in direction of delivering best quality of services to the customers.

4. Challenges faced by logistics providers

Inspite of many best practices followed by LSPs, few challenges hinder their path to success. Some unavoidable issues create bottlenecks in providing services to end users.

1. **Non industry status-** Despite 14% contribution towards GDP, logistics business in India is still not referred to as industry. However, millions of employment opportunities are developed by the sector. Logistics business is the backbone and key driver to economic and industrial growth. Governmental focus is still missing towards policy framework, development and recognition of logistics business as an industry.
2. **The infrastructural bottlenecks-** Logistics infrastructure is a critical enabler for economic development and urbanization. India has already taken steps to expand road and rail networks and modernizing harbours and airports. In the process of globalization, India is making better position in world trade channelling upsurge in transport volume. But, expansion of logistics infrastructure is not in sync with increased industry requirements. This is one of the important reasons of failures of transport capacities as per the requirement. Pathetic condition of roads, poor connectivity and inadequate air and seaport capacities are the major infrastructural bottleneck (Sahay et al., 2006). Inadequate infrastructure promotes corruption on highways and hinterlands.
3. **Behavioural Complexities-** There is needed to develop a deeper understanding of behavioural complexities which can be emerged through interaction between the buyer and logistics providers (Marasco, 2008). Many logistics providers have initiated approach of relationship marketing in order to investigate behavioural attributes of 3PL arrangements and their links with outcomes of such relationships. This is basically to understand the bonding processes and philosophies within 3Pl arrangement which can enhance successful buyer-supplier relationships.
4. **Poor quality of logistics operations-** Lack of policy framework, infrastructure issues, unskilled manpower in the trade and fragmented business share(More than 95% of LSPs are those who own less than 2 trucks and 98% are those who own less than 5 trucks) impairs quality of services.
5. **Inefficient Inspection Strategies-** In India, the inspection strategies and policies adopted by customs and border authorities are inefficient. Multiple handling at check-posts leads to delay and damages to goods. The central and state government levied various direct and indirect taxes on goods which makes their movement dificult within and across countries.
6. **Increasing globalization-** In the era of globalization, Indian products may lose competitive edge if not supported by efficient logistics functions. There is need to redesign things from scratch like warehousing is still considered as a real estate than logistic service. There is need to develop multimodal solutions to serve end user with integrated logistics services.
7. **Low rate of technology adoption-** Advanced IT tools are already in process which helps end users to trace and track their shipments but there are around only 2% LSPs which follows these practices. India is upgrading its resources technically but adoption rate is still very low. There is needed to create awareness about importance of IT adoption to all the stakeholders for better economic development.
8. **Skill Shortages-** Lack of specialized training and education in logistics business .Despite of very high contribution to GDP, unlike engineering or manufacturing sector, there is hardly any focus on training, education and technical knowledge is very low.

Table: 1. Core Infrastructural Bottlenecks

Mode of Transport	Infrastructure	Key Constraints
Road	• Total road network- over 4,689,842 kilometres (2,914,133 mi) in 2013 • National highways include 2% of Indian roads, they handled 40% of the traffic.	•Bad condition of roads •Low average speed(30-40km/hr) •Low Daily average distance travelled(250 km) •Issues at check-post and toll-post
Railways	Track Length-63,463 Kms	• Low service guarantee • No dedicated freight corridors • Low connectivity to industry • No fixed schedule for departure/arrival
Airports	• Domestic/International Airport- 125 •5 main metros account for over 85% of total freight traffic	•Only major airports has infrastructure to handle air cargo •High Waiting time •Poor warehousing infrastructure
Ports	• Ports-212(Major 12 & Minor 200) • Capacity-Major ports at 500mm MT & Minor ports at 230mn MT	• Heavy congestion at ports • Lack of good connectivity with roads • Out-dated equipment and technology • Low port capacities and no. of berths

5. Opportunities for Logistics service providers

Due to increasing globalization and expanding scope of businesses, there are many opportunities available for LSPs to grow and expand their scope. According to CII(2010), the

factors that impacts logistics in the country, like increase in domestic consumption, growth in manufacturing sector, new retailers from outside setting up businesses, growing export industry, government initiatives like setting up FTWZ AND FUZs, opening of new ports, National Transport policy being spearheaded by the planning commission, improvement of infrastructure etc.The areas which require more focus from LSPs so that they can act as competitive advantage in today's business market. Some instances like DFC (Dedicated Freight Corridors) development should be given more importance for better transport mechanism. In India, the concept of coastal shipping is just initiated so LSPs can increase its use by enhancing internal transportation through seaports. Similarly, the government can also motivate dedicated railway tracks for logistics activities. At present, only 2% of railway mode is used for shipments whereas in developed countries, the use of railways is around 14% of total freight. The shortage of cold chain warehousing result in huge wastage of perishable goods so one can work in same direction to improve and reduce wastage or spoilage. In the era of e-businesses, the requirements of 3PLs will be more as companies will promise for speedy, accurate and on-time delivery to customers. The functions of logistics providers can also be expanded by collaborating with other logistics parties serving same market segments. Today, the industrial focus is more towards making logistics activities leaner and greener. Industry is also focusing on reducing and compensating on carbon footprints they leave on the environment. Reverse logistics and green supply chain practices are more common practices followed by organizations in order to save environment.

6. Conclusion

From more than three decades, logistics providers are serving various organizations for their non-core activities including transportation, warehousing, value added service and distribution of goods to clients. .Many best practices followed by organizations become an important reason of wide adoption of logistics services provided by LSPs Reduction in cost, optimization of all resources, flexibility in service ,reduction in lead time service quality and customer satisfaction are few to name. In today's business world, all industries are taking support from 3PLs for their warehousing activities, wide geographical coverage, developed IT solutions and strong network. In spite of many best practices followed by LSPs, few challenges hinder their path to success. The infrastructure bottlenecks, recognition as industry, shortage of manpower skills, behavioural issues and poor logistics operations are some challenges which need to overcome for improvement of logistical activities. Due to increasing globalization and expanding scope of businesses, there are many opportunities available for LSPs to grow and expand their scope. Growing export industry, increasing domestic consumption, government initiatives for infrastructure expansion green perspectives and advanced warehousing & IT solutions can be options which can be chosen by LSPs for betterment and progression.

References

[1] A. Seyed-Mahmoud, How to choose an effective third party logistics provide, Management Research News, 26(7), 2003, 50 – 58
[2] Alberto De Marcoa, Anna C. Caglianoa, G. Manganoa, F. Perfetti, Factor influencing Logistics Service Providers Efficiency in Urban Distribution Systems, Transportation Research Procedia, 3, 2014, 499 – 507
[3] A. Marasco, Third-party logistics: A literature review, Int. J. Production Economics, 113, 2008, 127–147
[4] B. Huseyin, K. S. Soner, A. Pelin, C. B. Ozkan, E. Gozde, A distribution network optimization problem for third party logistics service providers, Expert Systems with Applications, 38, 2011, 12730–12738
[5] R. Bhatnagar, A. S. Sohal, R. Millen, Third party logistics services: a Singapore perspective, International Journal of Physical distribution and Logistics Management, 29(9), 1999, 569-587
[6] Boon-itt,Sakun, Achieving Product Quality Performance: The Roles of Supply Chain Integration and Information Technology, International Journal of Innovation Management and Technology, 2(5), 2011
[7] S. Boyson, T. Corsi, M. Dresner, E. Robinovich, Managing the third party logistics relationships:what does it take?, Journal of Business Logistics, 20(1), 1999, 73-100
[8] B. Christian, W. C. Marcus, Innovation management of logistics service providers Foundations, review, and research agenda", International Journal of Physical Distribution & Logistics Management, 41(2), 2011, 187-218
[9] W. Delfmann, S. Albers, M. Gehring, The impact of electronic commerce on logistics service providers, International Journal of Physical distribution and Logistics Management, 32(3), 2002, 203-22
[10] E. Ellinger Alexander, Ketchen Jr. David J. , Hult G. Thomas M., Elmadag Ayse Banu, Richey Jr. R. Glenn, Market orientation, employee development practices, and performance in logistics service provider firms, Industrial Marketing Management, 37, 2008, 353-366
[11] E. Pietro, M. Alan, S. Edward, Technology adoption in small and medium-sized logistics providers, Industrial Management and Data Systems, 113(7), 2013, 967-989
[12] F. Mehdi, R. F. Habibipour, C. S. Kamal, Assessing the Impact of Information Technology on Supply Chain Mangement, World Applied Sciences Journal 4(1), 2008, 87-93
[13] F. Helena, Performance management in supply chains: logistics service providers' perspective, International Journal of Physical Distribution & Logistics Management, 42(3), 2012, 296-31
[14] G. Shahram, M. S. Javad, T. Fatemah, P. Mahtab Panjtan, A. Somayeh, Touhidi, R. N. Roya, A. Nadia, S. F. Zadbagher, The Impact of Information Technology Application on supply Chain Performance, Interdisciplinary Journal of Contemporary Research in Buisness, 3(8), 2011
[15] H. Amer, K. J. Rogers (Jamie), Evaluating the efficiency of 3PL logistics operations, International Journal of Production Economics, 113, 2008, 235-244
[16] H. Susanne, A. Monica, Strategic development of third party logistics providers, Industrial Marketing Management, 32, 2003, 139-149

[17] H. Ming-Chang, Y. Ghi-Feng, Liu Tzu-Chuan, Reexamining supply chain integration and the supplier's performance relationships under uncertainity, Supply chain management: An International Journal, 19(1), 2014, 64-78
[18] J. Jayanth, T. Keah-Choon, Supply chain integration with third-party logistics providers, Int. J. Production Economics, 125, 2010, 262–271
[19] J. Lin, W. Yong, Y. Xiaoming, Decision and coordination in a competing retail channel involving a third-party logistics provider, Computers & Industrial Engineering, 76, 2014, 109–121
[20] K. Govindan, M. Palaniappan, Q. Zhu, D. Kannan, Analysis of third party reverse logistics provider using interpretive structural modeling, Int. J. Production Economics, 140, 2012, 204–211
[21] K. Gulgun, B. Gulcin, Assessing performance factors for a 3PL in a value chain, International Journal of Production Economics, 131, 2011, 441-452
[22] P. Kumar, R. K. Singh, A fuzzy AHP and TOPSIS methodology to evaluate 3PL in a supply chain, Journal of Modelling in Management, 7(3), 2012, 287-303
[23] R. C. Lieb, The use of third-party logistics services by large American manufacturers,Journal of Business Logistics, 13(2), 1992, 29-42
[24] M. Robert, S. Amrik, M. Simon, Quality management in the logistics function: an empirical study, International Journal of Quality & Reliability Management, 16(2), 1999, 166-180
[25] M. Naim, G. Aryee, A. Potter, Determining a logistics provider's flexibility capability, International Journal of Production Economies, 127, 2010, 39-45
[26] D. Rajasekar, Bhuvaneshwari, A study on the complexities of Indian Logistics Infrastructure, International Journal of Applied Engineering Research, 9(14), 2014, 2567-2574
[27] R. Rajesh, S. Pugazhendhi, K. Ganesh, Ducq Yves, Koh S. C. Lenny, Generic balanced score card frame work for third party logistics service provider, Int. J. Production Economics, 140, 2012, 269–282
[28] P. Romano, Coordination and integration mechanisms to manage logistic processes across supply chain networks, Journals of Purchasing and Supply Management, 9, 2003, 119-134
[29] B. S. Sahay, M. Ramneesh, 3PL practices: an Indian perspective", International Journal of Physical Distribution & Logistics Management, 36(9), 2006, 666-689
[30] S. Juho, T. Kari, F. Max, How logistics-service providers can develop value-added services for SMEs: a dyadic perspective, The International Journal of Logistics Management, 23(1), 2012, 31-49
[31] Tan Albert Wee Kwan, Yifei Zhao, Zhang Dali, Hilmola Olli-Pekka, State of third party logistics providers in China, Industrial Management & Data Systems, 114(9), 2014, 1322-1343
[32] T. Koichiro, Rationale for utilizing 3PL in supply chain management: A shippers' economic perspective, IATSS Research, 35, 2011, 24–29
[33] T. U. Daim, A. Udbye, A. Balasubramanian, Use of analytic hierarchy process (AHP) for selection of 3PL providers, Journal of Manufacturing Technology Management, 24(1), 2013, 28-51
[34] W. C. Yew, K. Noorliza, Explaining the competitive advantage of logistics service providers: A resource-based view approach, Int. J. Production Economics, 128, 2010, 51–67
[35] M. Ulku Ali, H. Bookbinder James, Optimal quoting of delivery time by a third party logistics provider: The impact of shipment consolidation and temporal pricing schemes, European Journal of Operational Research, 221, 2012, 110–117
[36] Z. Gunther, W. Michael, Planning and optimization of hub-and-spoke transportation networks of cooperative third-party logistics providers, Int. J. Production Economics, 78, 2002, 207-220