

Third Party Logistics and Beyond

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ABSTRACT: A transportation revolution occurred forty years ago with the deregulation of the industry, particularly in the United States. With the deregulation complete, the transportation industry has been slow in developing a total customer satisfaction environment particularly in terms of the industry-wide total-customer package. The bulk of the transportation service offered in the U.S. has not exceeded third-party logistics (3PL). Since our barriers for entry are low and at times non-existent, what roadblocks hamper U.S. transportation companies from developing services that its global competitors already offer its customers? The end game of supply chain logistics is to augment customer value (Bowersox, Closs, Stank, 2000). This paper aims to identify what obstacles have prevented transportation companies from transforming into fifth party logistics (5PL) providers who can ensure optimum customer service by resolving fundamental logistical problems efficiently. The transformation into 4PL or 5PL can help current 3PL transportation and other companies to provide maximum benefits to customers by resolving complex supply chain issues, improving warehouse technology, increasing efficiency in transit times and creating a seamless process through the use of information technology (IT).

KEYWORDS: Supply Chain Management, Logistics, 3PL, 5PL, Transportation, Evolving logistics systems

Introduction

Fierce competition in global markets, the introduction of products with short lifecycles, and the heightened expectations of customers have forced business enterprises to invest in, and focus attention on, the relationships with customers and suppliers (Simchi-Levi et al. 2000). Supply Chain Management (SCM) has become part of the senior management agenda since the 1990s. Executives are becoming aware that the successful coordination, integration and management of key business processes across members of the supply chain will determine the ultimate success of the single enterprise (Van der Vorst 2000). According to Christopher (1998) businesses do not compete as solely autonomous entities, but as supply chains. To assure competitive advantage and improve organizational performance, it is important to manage supply chain effectively (Li, et al. 2006). The increased interest in SCM has been spurred by developments in Information and Communication Technology (ICT) that enable the frequent exchange of huge amounts of information for coordination purposes.

Supply chain management emerged in the early 1980s as companies migrated to thinking about the different forms of integration using IT, EDS, and emerging warehouse technologies. Houlihan (1985) as well Jones and Riley (1985) stated that supply chain management (SCM) was first an integrative approach to the management of material flows from material sources to customers. Currently there are no asset-based or non-asset-based transportation firms that offer fifth-party logistics (5PL) as it is considered a relatively new model by American industry standards. A marginally higher number of companies such as UPS and Deloitte offer fourth-party logistics (4PL). Thus, UPS (asset-based) and Deloitte (non-asset based) can be considered “full service” transportation companies. Previous research has shown that excellence in forming logistics activities and capabilities is associated with superior organizational performance (Lambert & Burduroglo 2000; Lynch, Keller, & Ozment 2000). As a result, customers have rewarded such companies with a healthy financial bottom line. According to Rutner and Langley (2000), the logistics function has long been under pressure to demonstrate its contribution to organizational performance.

Table 1 demonstrates the distinguishing characteristics between the different layers of (x) party-logistics, with 1PL being the simplest logistical chain and 5PL being the most complex in terms of supply chain management. As seen in Table 1, 1PL is a straightforward relationship between the manufacturer and the consumer. On the other hand, 2PL and 3PL, both require tactical relationships with other firms for a manufacturer to connect with the consumer. Both, 4PL and 5PL systems go beyond tactical relationships into the realm of strategic relationships, using extensive technology and information exchange between, among, or within the firms involved in the complex supply chain. The drawbacks are loss of control and relationships with supply chain members. The distinguishing factor for 5PL is that the strategic relationship relies on a strong Information Technology (IT) component (Sangam 2006; Sohail and Al-Abdali 2005).

Table 1. What do different Party Logistics Mean?

X-PL	Implies:
1PL	A manufacturer that delivers its own product to the consumer
2PL	An asset-based transportation company that owns equipment such as UPS or Yellow Transportation Company that works directly with customers internal employees (warehouse personnel).
3PL	An asset-based or non-asset-based company that acts as a broker for the manufacturer or where the shipment originates. This is also a tactical relationship since the 3PL provider works closely with warehouse management.
4PL	A company that performs all supply chain functions, manages and improves the client's supply chain, has few physical assets but has extensive knowledge and technology-based assets such as real time GPS tracking. This is a strategic relationship since it now involves executive level logistic managers within the manufacturer's workforce.
5PL	A company that turns customer's supply chain into a function that is completely driven by technology, has physical assets, possesses extensive knowledge with leading edge technologies. This is a strategic relationship since it now involves executive level logistic managers within the manufacturer's workforce.

Asset-based party logistics companies provide a comprehensive schedule, better pricing, tracking and tracing capabilities such as UPS, XPO Logistics, and Yellow Freight Lines than non-asset-based organizations. A non-asset-based party logistics company is one that does not own or operate tractor trailers, cargo vans, airplanes, ships, or trains such as UNILINK Transportation and C.H. Robinson. A non-asset-based logistics company has a lot of freedom in choosing service providers that can best meet the needs of their customers. There are currently no 5PL service providers in the United States.

Brief History of Logistics

The 1980s was a volatile time in American history. In late 1975, public interest increased in deregulation and became intense thus federal laws changed with the Railroad Revitalization and Regulatory Reform Act, which was passed by the 94th Congress on Feb 5, 1976. Since the deregulation of transportation via the Motor Carrier Act of 1980, American roads have seen an increase in trucking carriers from 20,000 in 1980 to a whopping 1.2 million today. Warehousing companies that exclusively provided storage for the trucking industry expanded their footprint in the whole supply chain and emerged as freight movers. The rise in the number of companies providing both storage and transport services and the advent of information technology created space for third-party logistics companies (Symbia 2019).

In the 1990s, the logistics management industry took off when countries such as China and India opened their economies to a global business and began to attract the interest of companies looking to take advantage of cheap labor and local resources. As a result, the demand for

companies capable of streamlining complex supply chain processes skyrocketed, both domestically and globally. The increase in the number of companies providing third-party logistics (3PL) services led to some companies specializing in niche markets such as frozen food products and construction industries and in offering vehicles and facilities capable of handling the specific needs of the industries (Bookbinder, James & Tan 2002).

Between 2004 and 2008, the use of Information Technology was responsible in adopting its growing footprint towards IT based value-added services (internet-based transportation and logistics markets) in logistics (supplier management systems and supply chain planning). In 2008, web enabled communications and visibility tools were considered highly favored IT services by logistics users, closely followed by warehouse and distribution center management and transportation management and execution. Logistics players have many concerns in deciding to adopt a technology. One example of this is the Radio Frequency Identification Technology (RFID) which is quite unique and is widely considered by many logistics players. In 2005 and 2006, RFID was a technology with the highest future expectations. However, the 3PL growth analysis in 2007 noted that these lofty expectations were not fulfilled and there was no growth in actual use from the figures for 2005 and 2006 (Langley 2010). In short, due to its infancy, too many problems were not addressed, and the idea was dropped.

A. Creating Customer Value

Radical advances in managing supply chains stem from electronic commerce, notably in transportation and distribution, now widely adopted (Hosie et al. 2012). There were four (4) emerging trends in the logistics industry as early as the 1990s, as presented by Langley & Holcomb (1992). The first, and perhaps the most significant trend was the growing recognition of logistics as a means of creating customer value even though the concept of logistics was still unfamiliar in the early and middle 1980s. While the understanding was not clear, it was more frequently acknowledged by companies in the 1990s. While the logistics literature certainly lends substance to the statement there is increasing number of initiatives being taken by business firms to capitalize on the customer already created by logistics. La Londe & Masters (1994) have described the implementation of powerful and inexpensive technology as the factor that has had the greatest positive influence on the operation of logistics systems in the 1990s. The second trend in the 1990s was that firms were directing greater resources towards logistics and the senior logistics executive, a relatively new position, was becoming more visible and involved on a firm-wide basis (Langley & Halcomb 1992). The third trend was directed towards the integrative aspects of logistics and the fact that the length and consistency of the customers “order cycle” was emerging as a key concern of firm-wide interests. In effect, the integrative aspects of logistics qualified this area as a major contributor to the creation of customer value (Langley & Halcomb 1992). The fourth emerging trend in the 1990s was the development of partnership arrangements with suppliers, customers, other channel members, and external third parties in the interest of achieving desired results in logistics. Langley et al. (1992) argued that the four observations had become “wholistic” and proved that expanded logistics must be adopted by firms because it was one where the “win-win” paradigm was recognized as being valid.

B. IT Integration

In 2008, web-enabled communications and visibility tools were considered highly favored IT services by logistics users, closely followed by warehouse and distribution center management and transportation management and execution (Hosie, Tan, Sundarakani, Kozlak 2012). A remarkable rise in the international significance of services is also evident in the late 1990s and early 2000s, which has been associated with a host of dynamic changes in global economies, including customer expectations and demands, and the opportunities offered by new technologies investigating more ways of enhancing the efficiency and effectiveness of business processes. The development and inclusion of integrated IT platforms give rise to customer expectations of immediate service information like tracking and tracing capabilities, a service that was deeply lacking in the industry.

These changes in the world economy are driving growth in customer expectations and demands to leverage the commercial opportunities offered by new technologies (Haynes and Thies, 1992). The industry realized that a network approach is a suitable theoretical approach for conceiving the interrelated relationship between Logistics Service Providers (LSPs), their customers, and the suppliers (Hertz and Alfredsson 2003).

C. Why research 4th PL and beyond

Logistics runs at the speed of business, as a result of such speed its forever changing to suit customers. Hosie et al (2012) argued that the theory and practice of a networked approach to Supply Chain Management (SCM) are used to trace the evolution of management logistics. Reforming influences on competitive forces have deregulated and globalized. These technological and process advancements help companies to make improvements in their business processes but also give freight forwarders more freedom to modernize their propriety systems and become increasingly sensitive and perceptive to customers’ needs. The power of the Internet and World Wide Web cannot be ignored. No other technology has made information so accessible and thereby changed the scope of business, entertainment, and society. The claim that the Internet is a participatory space (Kim, Tan, Bielaczyc 2015) is an optimistic view, as participation does not necessarily translate to active contribution in many cases.

Information technology (IT) plays a key role in disseminating 4PL & 5PL processes. Hosie et al (2012) discussed why businesses should consider and embrace 4PL & 5PL technologies: expansions of marketing channels, more efficient transportation modes. Customers can finally realize satisfaction, become more efficient and make optimum logistical decisions. As the services for X-Party logistics are continually evolving it is important to draw a fundamental distinction between them. As shown in Table 2, services could be tactical (doer) or strategic (develops/planning/implements).

Table 2. Summary of Services

	Custom Broker (Non-asset)	Freight Forwarder (Non-asset)	3PL (Non-asset or Asset)	4PL (Non-asset or Asset)	5PL (Non-asset or Asset)
	Tactical	Tactical	Tactical	Strategic	Strategic-IT Supply Chain
Service	Prepare docs for import/exports, payment of duties/taxes	Arranges transport/ of goods/preps docs/storage & insurance	Performs all logistical functions for customer	Performs and manages/improves client’s supply chain functions.	Develops client’s supply chain into a function that driven by technology
Assets	Narrow Assets, knowledge and technology assets	Some assets (physical, knowledge and technology)	Some or no physical assets. Primarily knowledge-based, technology for tracking shipments	Some physical assets. Extensive knowledge and technology-based assets	Some physical assets. Extensive knowledge and technology-based assets
Potential Benefits	Expert in customs clearance	FF can arrange costs and help with route efficiency for those companies who ship international.	Help companies who lack internal supply chain, resources and knowledge. <ul style="list-style-type: none"> • Inventory storage and management • Picking and packing • Freight forwarding • Shipping/distribution • Customs brokerage • Contract management • IT solutions • Cross-docking 	Help companies with supply chains <ul style="list-style-type: none"> • Logistics strategy • Analytics incl. transportation spend, analysis, capacity utilization, & carrier performance • Freight sourcing strategies • Network analysis/design • Consultancy • Business planning • Change Mgt. • Project Mgt. • Control tower and network mgt. services, coordinating a wide supplier base across many 	Help large companies with highly complex supply chains. <ul style="list-style-type: none"> • This applies when the switch is made from supply chains to supply networks. • service provider guarantees the management of networks of supply chains. • The industrial actor hires third parties for the supply of strategic, innovative logistical solutions and concepts. • provider develops

				modes and geographies • Inventory planning and management • Inbound, outbound and reverse logistics mgt.	and implements, preferably in close consultation with the client, the best possible supply chains or networks. • often linked to E-business.
Potential Draw-backs	Unknown	Unknown	<ul style="list-style-type: none"> • Focused on freight movement. Don't focus on the management and efficiency of the supply chain. • You have less control over your inventory and the customer experience • Finding the right provider who you can trust and rely on can be time consuming • 3PL can be an expensive cost, especially when you only have small quantities of orders • Generally, 3PL providers won't handle perishable, hazardous, or flammable goods 	<ul style="list-style-type: none"> • Loss of control/relationships with supply chain members. • Risk is high losing long-term partnerships. Likely to be expensive 	<ul style="list-style-type: none"> • Loss of control/relationships with supply chain members. • Risk is high losing long-term partnerships. Likely to be expensive

Consequences of Not Moving to 4PL & 5PL Systems

U.S. industry is adopting integrated strategic supply chain management, but it is doing it very slowly. The reason for the slow adoption is complexity, which explains one of the impediments to the adoption of integrated supply chain management strategies (Monczka and Morgan 2001). Integrated supply chain management is a strategy based on using a company supply function as a competitive tool. The chain, itself, is a connected series of company organizations, resources, and activities involved in creation and delivery of value in the form of both finished products and services to end customers. An additional explanation to the slow adoption is due to a variety of factors including the complexity of higher-level strategies, the resources, and commitment necessary to execute the strategy, a lack of a supply base optimization effort, and personnel who lack the skills and capabilities necessary for developing advanced sourcing strategies (Monczka, Handfield, Guinipero, Patterson 2009).

Monczka et al (2009) stated that strategy involves integrating all decisions that affect the design and flow of purchased items, materials and services into finished products in a way that makes the company more competitive. In addition, a supply chain management involves significant changes in traditional thinking in terms of how a company views supplies, uses technology and communications, maximizes its use of standardization and outsourcing opportunities, develops value-oriented management sourcing techniques, and shapes its supply base. Monczka et al (2009) concluded that is at the heart of the slow take off for supply chain management as a competitive strategy.

Lai et al. (2009) explain that from an operations perspective, the scope of business logistics is very broad. For this purpose, many businesses have found logistics to be an area in which to reduce costs and improve the benefits of services. Examples include unnecessary expedited shipments due to a lack in the visibility of shipments and requirement schedules, excessive production due to inaccurate forecast of market demand, and lost sales due to a misunderstanding of or slow response to customer requirements.

Supply Chain Management (SCM) has been changing rapidly since the early 1990s. These contextual changes have been driven by changes in strategic management and business structure at the firm level and from changes in the external business context within which business is embedded (Monczka & Morgan 2001). This has created a need to identify the business drivers causing this contextual change. Eventually however, this view of logistics management changed

in response to emerging managerial philosophies and practices. Logistics management thinking and practices have evolved from a purely operational clerical function to a sophisticated approach which integrates complex strategies and technologies.

Varma, Wadhwa & Deshmukh (2006) define logistics as “confined to movement of material, storage and inventory management, whereas SCM has a larger scope covering issues related to purchase, partnerships and customer satisfaction in addition to logistics related issues.” A prominent option for U.S. service providers is to effect changes and move its direction to the next phase of (X) party logistics is by highlighting innovation thereby decreasing competition. While the U.S. has over 3,000 transportation companies offering a varied menu from 1 Party Logistics (1PL) to 4th Party Logistics (4PL), extremely few have evolved to provide customers the next phase of evolution: 5th Party Logistics (5PL). The base infrastructure has already been laid out. By not moving towards 5PL, service providers and customers miss opportunities that are reachable.

From a customer’s perspective, not utilizing technology as a force in supply chain management (SCM) amounts to a misuse of emerging technologies since the issues surrounding the technological forces driving changes in logistics are the focus of this treatise. In concert with technology as a force, SCM services are rapidly evolving due in large measure to the widespread adoption of electronic commerce (Cabdoi, 2003). Improved Warehousing Technology is impacted with bar coding technology. It has been in use for order picking and fulfilment. Customers can now track their orders via internet (Li, Liu, Lei, Zhao, Ren 2003; Mankowski and Weiland 2018).

A supplier’s impact of underutilizing these emerging technologies cannot be understated. These are some value-added services that suppliers are missing out on therefore not enhancing services to its customer base. Something as important as the expansion of marketing channels which impacts expenses. Costs for information processing have dropped since the 1900 forward resulting in managing global production systems (Hosie et al. 2012). The transportation industry has undergone changes for the last two decades with Geographic Information System (GIS), Global Positioning System (GPS) and radio-frequency communication system (Hosie et al 2012). More powerful Information Technology has grown exponentially from the 1980s. This has subsequently had a massive impact on all business areas, especially transportation and distribution (Lewis & Talalayevsky 2000).

There are emerging technologies that still need to be utilized, albeit, and top managers that must learn to bring technology and adequate skills together. Partial solution is represented in a paradigm shift (thinking outside the box) and knowing that progress is being limited to the current talent. In addition, recognizing managers are latent in continuing to develop the next logistic professional due to fear of losing their current position. The consequences are real and will be felt in annual revenues and profits which are currently lost with European firms that are capitalizing on the “sleeping giant.”

Solutions to Encourage Growth of 4PL & 5PL Companies

In the face of challenging global competition, businesses are becoming more focused on customer needs and finding ways in which to reduce costs, improve quality and meet the growing expectations of their customers (Lai and Cheng 2009). 5PL can meet those challenges. Although there a few 4PL providers, the future lies in 5PL. The complete solution is to fully integrate information technology (IT), executives and managers accepting new paradigms in the development of skills and sales to move businesses toward presenting the next level of full customer service. The solutions include Internet, RFID, electronic data interchange (EDI), bar coding, tracking and trace software, and transportation software. When that is accomplished, the results will be that 5PL level of service can be profitable to both service provider and customer. The interesting thing to observe is that all the solutions required to move towards a 4PL or 5PL status are already available and implemented in varying degrees in the industry. The problem arises when these are not simultaneously used to maximize efficiency within one firm. However,

let us visit each of the solutions and identify what they would consist of, and how they could be simultaneously implemented to achieve a 4PL or 5PL status.

The first solution is outsourcing inventory management and providing key 4PL & 5PL activities such as warehouse management, inventory planning, forecasting activities, customs management, routing operations and network optimization (Win, 2008; Schramm, Czaja, Dittrich & Mentschel 2019). The second solution is to outsource the Supply Chain Management (SCM), an auxiliary service, to another organization which encompasses both evolutionary PLs (Ansari and Modarress 2010) which will enhance the efficiency and effectiveness of business processes. Thus, the strategic management of services requires managers to delineate the services provided through the development of measurable criteria and those associated with service operations. In other words, getting managers to shift their supply chain into a function that is completely driven by technology. This is particularly the case with intangible services such as outsourced SCM (Langley 2016; 2018).

The third solution to achieving a 5PL evolution is changing the landscape of logistics service providers (LSP) service. LSPs are most categorized in terms of the services that they provide on a continuum of asset intensive activities to IT intensive activities (De Souza, Sundarakani, and Shun 2008). Integrating LSPs with the business model of a company would ensure an efficient customer service model, without having to completely redesign the firm's primary goals.

The fourth solution that has not been fully captured by executives is how the internet should be integrated in the development of 5PL services. More than 50% of all transactions between carriers and their customers are estimated to be dealt with over the internet (Stock and Lambert 2001). EDI is probably one of the oldest technologies used in transportation and distribution. It can be defined as the application-to-application exchange of standard format business transactions. EDI replaces verbal and written communications with electronic ones. Stock and Lambert (2001) document the benefits of EDI implementation and demonstrate how it can enhance the logistical efficiencies in a business. The fifth solution that is embedded within the use of EDI is the use of bar code technology. Bar coding at the warehouse makes data collection more accurate, speeds up receiving operations and the labor of data collection and helps to integrate data collection with other areas, leading to better database and inventory controls (Li et al. 2003). The development of bar code reading techniques and a drive to include in the code as much information as possible led to the creation of a new code type with greater density of data recording.

The sixth solution to achieving a consistent shift to 4PL & eventually 5PL is the consistent use of RFID to track and trace transports, shipments and products. The technology has been greatly improved in recent years. Swedberg (2018) states that in 2018, RFID reduced the amount of time that drivers of inbound trucks spend checking in and receiving instructions by 60 percent. RFID allows users to relay information such as global positioning which provides real-time knowledge of a good's current location and directions to the intended destination. If used in the warehouse or distribution center, radio frequency results in significant improvement to the quality of order picking and shipping accuracy (Coyle et al. 2000). The seventh solution, implemented in tandem with the RFID application would be the use of other transportation software such as McCloud (Haverly and Whelan 1996). Transportation-specific software have several functions and are divided into four groups: transportation analysis, traffic routing and scheduling, freight rate maintenance, and auditing and vehicle maintenance.

The last solution for the realization of 5PL structures is the usage of e-Ports. It is designed for the use of e-commerce techniques to improve container terminal productivity. Trucking companies use e-Ports as the interface into the vehicle booking system at each of the company's container terminals, as well as the source of information on vessel movements. e-Ports permit industry to have access to real-time container tracking, together with as a range of reports tailored to the requirements of types of business (Rosencrance 2000). The level of technology used will vary between and within firms. Despite such variation, the use of technology is expanding at a rapid

pace in the area of transportation and distribution and it will continue to grow well into the future (Cabdoi 2003). The above discussion highlights the complexity involved in the SCM function by technological innovation, which in turn must be dealt with by a growing number of experts.

Conclusions

To reiterate, a revolution in transportation occurred 40 years ago with the deregulation of the industry. Since then, the industry has been lacking in developing total customer satisfaction by not developing an industry-wide total customer package. The roots of today's IT challenges lie in yesterday's technology investments. Many 3PL providers operate legacy ERP and operational applications that run on mainframes or mid-range systems. Acquisitions add to the systems complexity. As a result, 3PLs are spending the lion's share of their IT resources keeping it all running. The difficulty of rationalizing and modernizing legacy applications means some 3PLs are maintaining multiple data silos with duplicate and incorrect data. Integration that does occur within the 3PL as well as with partners is often based on proprietary protocols and legacy EDI standards. Shippers, too, face issues with legacy technologies that consume resources and impede integration efforts.

Our findings, based on looking at a variety of studies on Logistics systems, suggest that the industry has a long way to go to give customers true value due to the lack of efficient expansion from 3PL to 4PL or 5PL systems in various industries. There are some emerging technologies such as RFID, EDI, tracking and tracing, and some transportation software, that are being sporadically or inefficiently used by various companies, but this is not enough to ensure sustainable solutions to logistical issues. As with the initial resistance to accept change and move towards the adoption and implementation of the 5PL value proposition, executive managers are slow to break the paradigm in their current thinking by not marrying technologies, having the will to change, and having the necessary skills to push clients to greater efficiency. Innovative business approaches are needed to meet the challenge of these new competitive environments and the diffusion of innovation within and between companies will be essential in redefining SCM.

In short, users are just beginning to understand the differences and related benefits of the various relationship models. Thus, companies are becoming pessimistic about adopting the "strategic" type of relationship models because of the general confusion of terms, lack of proven case studies, and complexities involved. No comprehensive studies have been undertaken in the last five years; therefore, information is limited as to the development of 5PL technologies. There is a long-standing need for a comprehensive and holistic approach to the fulfillment of the most intricate and complex supply chain requirements across the entire spectrum of logistics. There is a potential drawback: without a paradigm shift, the concept that 5PL may not achieve the claim of improving supply chain efficiency and effectiveness in the form of cost, service, performance, and value.

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