Transition or Transformation? Emerging Freight Transportation Intermediaries

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Abstract

During the past two years, traditional freight transportation intermediaries, including freight forwarders and third party logistics providers have been joined by a large number of new intermediaries. The main drivers of the development of these new companies are advances in information and communications technologies, the development of web-based or on-line freight transportation marketplaces and the emergence worldwide of business-to-business (B2B) marketplaces and business-to-consumer (B2C) e-tailers. Advances in IT make possible many new operational paradigms and potentially enable the efficient integration of supply chains. In this paper we examine these new companies, discuss the potential benefits and costs of shifting from traditional 3PLs to these on-line service providers.

Key Words: freight transportation, intermediaries, Supply chain management, Third Party Logistics, 3PL, e-commerce, Information Technology
Introduction

During the past two years, traditional freight transportation intermediaries, including freight forwarders and third party logistics providers have been joined by a large number of new intermediaries. The main drivers of the development of these new companies are advances in information and communications technologies, the development of web-based or on-line freight transportation marketplaces and the emergence worldwide of business-to-business (B2B) marketplaces and business-to-consumer (B2C) e-tailers. Advances in IT make possible many new operational paradigms and potentially enable the efficient integration of supply chains.

On-line logistics providers are attempting to use the power of the Internet and emerging software tools to interact efficiently with shippers, carriers and traditional third party logistics (3PLs) providers. Some of these are online freight marketplaces that make the purchase and sale of freight capacity web-enabled ranging from the simplest form of load posting board to sophisticated online exchange. Some are developing software tools either to optimize freight operation or integrate shipping solution with web merchants. Others provide information or aggregate buying power to logistics industry. On the one hand, these “disintermediate” 3PLs by providing many of the services previously handled by those companies such as freight consolidation and transportation procurement. On the other hand, they provide a forum for 3PLs to operate more efficiently and to provide more lucrative value-added services to their clients. There appear to be four types of companies emerging: online freight marketplaces, application service providers (ASP), purchasing consolidation markets and infomediaries. Within each category a variety of business models are being used. We define each of these below:

1) Online freight marketplaces: Online freight marketplaces provide online transportation procurement services and/or other web-hosted logistics management services. These aim to match freight transportation demand and capacity to reduce the cost and increase the facility utilization. Based on different business model used, it can be sub-divided into the following:
Spot market: A spot market allows shippers and carriers to post available loads or capacity on the web. In a passive spot market shippers and carriers “post and browse” for matching capacity/loads. In the simplest case this is a bulletin board service. In more sophisticated cases shippers and carriers may be notified of matching capacity/loads from which they pick the best carrier or load, some also provide services to pre-select or rate the carriers according to some criteria. In an active spot market the equipment/load is matched automatically.

Auction: An auction space enables the purchase and sale of freight transportation capacity online based primarily on price. For example, the shippers post loads and define some selection criteria, and carriers make bids on them.

Exchange: An exchange may provide spot market and auction capabilities but must also provide creative solutions for shippers, carriers and 3PLs to handle logistics process and facilitate the transaction between them. It must do more than move paper or telephone based processes to the web. It should be an active participant in the business processes of its partners and member and should drive the creation of new, more efficient business practices.

2) ASPs: Application service providers are primarily developing web-enabling and e-commerce enabling technology for the logistics industry. Some are providing shipping solutions and freight optimization to the web merchants, the web merchants and exchanges often want to integrate their functionality with their web sites, the most common function is the rate quotes and shipping tracking. Many of these are also developing spot and auction markets and some are developing exchanges by themselves. Though it seems likely that the most successful will either give up their own marketplaces and partner with companies whose primary product is the marketplace itself or simply provide software to many of the successful marketplaces.
3) Purchasing consolidation sites: These sites provide an opportunity for member companies (typically small carriers) to aggregate buying power to purchase logistics-related equipment and supplies at bulk rates over the internet.

4) Infomediaries: These web sites are pure information providers to facilitate the logistics operations. Some online freight marketplaces also have information services which provide their members with transportation supply information, such as fuel and tires. These are also sometimes referred to as portals.

5) E-fulfillment Companies: Another type of ASP includes those companies providing web-enabling technology to handle the package and LTL shipments generated by e-commerce companies.

In this paper we examine the development of this new industry, discuss its promise and potential impact, and examine hurdles to its success.

Background

Freight transportation intermediaries typically act as a bridge between shippers and carriers to facilitate the flow of information and goods and to leverage economics of scale. Prior to 1978 the U.S. for-hire transportation industry was subject to significant economic regulation. Rates charged, market entry and exit and service levels were monitored by the Interstate Commerce Commission for trucking and rail and by the Civil Aeronautics Board for air freight. Since deregulation, third party logistics companies have emerged as providers of a wide variety of logistics and supply chain management functions.

Some 3PLs grew out of the shipper’s agents and freight brokerages that existed under regulation. The term freight broker applied to ICC licensed truck brokers that
handled general commodity freight. These brokers acted primarily as marketing agents and load matchers for smaller trucking companies while shippers agents were intermediaries who bought large volumes of intermodal services from railroads and then sold these to shippers (Brown, 1984). Until very recently most 3PL companies originated from a parent transportation or warehousing company, many operating as subsidiaries to their parent company. Based on the ownership of transportation equipment or warehouse facilities, 3PL providers were historically divided into two categories: asset-based and non-asset based (Sheffi, 1990). Now the vast majority of 3PLs appear to be non-asset based, but working closely with asset based carriers or warehouse managers. These tend to be either management or knowledge-based consulting companies. Rather than handling the physical distribution themselves, these companies appear to focus on activities on strategic or tactical level.

These firms typically provide some of the following services: freight consolidation and transportation procurement, freight payments and auditing, carrier selection and rate negotiations. In addition, these firms may develop information systems and manage inventory and customer order fulfillment (Boyson et al, 1999). The rapid growth of international trade activities has been followed by the birth of strategic channel intermediaries, such as foreign freight forwarders, non-vessel-owning common carriers, trading management companies, customs house brokers, export packers and port operators. Several recent studies have addressed the issue of growth in the 3PL market in detail. A study by Murphy and Poist (1998) provides a review and synthesis of research on this topic.

Lieb and Peluso (2000) and Lieb and Randal (1999) discuss insights gained from a multi-year survey of chief executive officers of the largest 3PL providers in the United States. Key findings reported in the paper are the following: most of the companies surveyed are autonomous subsidiaries of companies in the transportation and warehousing business; most have significantly increased their international operations in the past few years; most are increasingly forming strategic alliances with other 3PL companies as well as companies primarily involved in warehousing, trucking, freight
forwarding, and customs brokerage. That study followed an earlier study by Lieb (1992)[ ] that had as its focus large manufacturers, users of 3PL services. Similarly, Leahy, Murphy and Poist (1995) [ ] examine the determinants of successful third party relationships from the provider perspective. Twenty-five potential determinants of success are examined. Among these, customer orientation and dependability emerged with the highest importance ratings. More recently, Sankaran and Charman (2000) [ ] performed an exploratory study of the effectiveness of 3PL contracts as well as the process by which buying firms purchase services. Creative contracting may emerge as an increasingly important topic in the study of shipper behavior.

The benefits of outsourcing logistics services in some cases can be very significant. 3PL’s have made "build to order" manufacturing systems possible in the computer industry where there would have been otherwise infeasible (Harrington, 1999). Rapidly changing markets suggest that the industry should see phenomenal growth in the next several years.

**Potential Benefits**

The potential benefits of on-line freight transportation intermediaries are enormous. For small carriers, convenient access to spot markets could make a huge difference in profitability – providing the cost to use access these markets is reasonable. More than 70% of trucking companies operating in the U.S. in 1998 had six or fewer trucks. Access to inexpensive tracking and tracing and automated billing and freight payments systems will allow small carriers to operate with little administrative overhead. Many small carriers were already acting as sub-contractors to larger carriers, the fact that these relationships are moving on-line should make these relationships more efficient. Medium sized carriers could also benefit from participating in markets that encourage groups of shippers and carriers to collaborate. So called collaborative networks in which one or more shipper and one or more carrier cooperate to create a more dense network could provide significant added efficiencies. If issues related to proprietary information
and competitive issues can be resolved, truckload carriers in particular could benefit through scheduling loads for multiple shippers simultaneously. Large carriers will benefit most from participation in closed networks which facilitate improved communication (web based EDI rather traditional) and which allow them to subcontract sub-optimal loads in a (public or private) spot market.

Potential Drawbacks

Major carriers benefit significantly from the development of long term contracts with high volume shippers.

Market Growth of Transportation Intermediaries

Freight transportation intermediary market includes third party logistics or contract logistics firms, customs brokers, freight forwarders, freight consolidators and shippers associations who arrange and manage the movement of goods between shippers and carriers. In addition it includes the new on-line services and e-commerce fulfillment companies. Here we consider only the third party logistics market and the new on-line marketplaces. The service offerings of these new companies have considerable overlap with the traditional 3PL industry.

One of the difficulties in estimating the size and scope of the 3PL industry is that it is hard to draw the line between 3PLs and other freight intermediaries. There are various estimates of the total size of current 3PL market in the U.S., and the emergence of the online logistics providers complicates matters further. A fairly reliable estimate is that the revenue of third party logistics market is estimated to be $64 billion in U.S. with
another $75 billion globally in 2000[x -- Bear]. The annual revenue growth rate has been in the 10-20% range of 15-20% over the last five years. It is not clear how many firms exactly are providing third party logistics services currently in U.S., one source lists [logistics] listed over 400 3PL companies [Logistics]. If we include the roughly two hundred online logistics providers that have emerged in the last few years, we estimate that there are roughly 600 ~ 700 3PL companies operating in U.S.. These companies vary widely in size. Among them, big players like C.H. Robinson and Ryder logistics have an annual revenue of billions of dollars with thousands of employees, while hundreds of small companies only have a few millions of dollars of revenue with less than 100 employees.

The third party logistics industry emerged in U.S. during the 1980's and 1990's about and is still relatively young. It has a bright future with huge potential. Optimistic estimates expect 3PL, and especially the e-logistics market to increase exponentially in the near future [Bear, x]. The predicted increase in the size of the 3PL market is well founded. Logistics costs continue to increase and logistics services continue to be more and more complicated. This has led to an increase in logistics services out-sourcing. In 1994, business spent $421 billion on transportation costs move 3.5 trillion tons of freight across U.S., this number increased to nearly $562 billion in 1998, and that year the total logistics cost including carrying costs and other logistics-related costs reached $921 billion, 9.9% of U.S. economy[BTS, American Trucking Associations, BEARS][Bearx]. While not all of this market is appropriate to be outsourced to third parties, many logistics services are. This point is further supported with an executive survey of U.S. Fortune 500 manufacturers. Their study indicates the rate of 3PL service usage among businesses
increased to 77% in 2000, from 69% and 65% in 1999 and 1998 respectively. 75% of respondents also indicated that they expected to at least moderately increase the use of 3PL services [Leib].

The development of E-commerce and participation of new online transportation intermediaries will likely add to the growth of third party logistics market. While the B2B and B2C e-commerce markets are still growing, many of these companies lack the necessary resource to handle the logistics services, and some have a changed freight pattern with increase of smaller and expedited shipments, so it seems natural for them to outsource their logistics function. The e-commerce logistics cost in U.S. is about $42 billion in 2000, and it is expected to grow up to $274 billion in five years [bear].

Despite the current (early 2001) dip in demand for freight transportation services, due to the overall decline in demand for high tech and other durable goods, over the next several years, the steady growth of total logistics costs and trends of outsourcing, as well as the development of e-commerce and the plethora of online logistics providers, will help freight transportation intermediaries particularly those with reliable web-based solutions to increase their market penetration.

Recent Market Re-Organization and Trends
During the last few months this new industry has witnessed rapid changes. Some online freight exchanges ceased operation or merged with other companies; many announced changes in their top management; others formed strategic alliances with new partners. New players continue to enter the already congested market. For example, just a short time after FreightWise, a relatively well funded online multi-modal freight marketplace backed by BNSF rail, suspended operation last year, and iCargo, an online air freight marketplace shut down early this year, a U.K. based web transportation marketplace, eLogistics opened for trucking business in March of 2001. Most recently, in April, 2001 Trantis, “a new type of online transportation trading system” and a potential heavy hitter in the industry, launched its beta-operations.

Though the shakeout and consolidation of online logistics providers was anticipated by many analysts, the number of e-business completely shutting their doors has been so far, unexpectedly small. Last year, several observers identified more than one hundred online logistics providers (for example [Regan & Song]. Armstrong & Associates, a logistics consulting firm, maintains a current list [ ]. Most of them are still operating though some have slowed their initial launch plans or shifted their focus. Despite this, there are numerous indications that the online freight transportation markets are undergoing important changes.

The most frequently observed change is that both the e-businesses and the mainstream freight transportation industry has begun to realize the limitation of pure online public freight exchange. The pure online public freight exchanges were originally
targeted towards matching freight and transportation capacity. The main idea is that these can leverage economies of scale, reduce search costs and disintermediate redundant links in the logistics supply chain. Nonetheless, the actual transaction volumes on online exchanges to date has been far short of expectations. While most exchanges do not disclose their transaction volumes for competitive reasons, according to an article published last year, NTE, the oldest online U.S. freight exchange in U.S. “gives shippers access to 400 trucking companies”, while C.H. Robinson, which claims to be the largest traditional 3PL has connections with 24,000 carriers. As a result, we will continue to see more closures during the next year. NeoModal, an application service provider closed its online load-matching and rate-negotiation site – eRateRequest, and Celarix, one of the apparent market leaders, also closed its Celarix Marketplace very recently.

The reasons why shippers, forwarders and carriers hesitate to participate in online freight exchanges was discussed earlier in this article. Those have lead many on-online marketplaces to shift their focus. One shift is from the public online freight marketplace to the private collaborative network. Instead of being open to any shipper and carrier, the private marketplace is a platform with access only for one or small group of companies and their transportation partners to trade on the Internet. This model allows shippers maintain the long-term relationships with their transportation providers, gets rid of “unqualified” traders but continues to aggregate volume and automate the transaction process. Companies like Nistevo of Eden Prairie, Minnesota and 3Plex of Cambridge Massachusetts, and ___ offer technologies to help customers to set up their own private exchange with their carriers.
Recent data also indicates that online logistics providers are making efforts to offer integrated supply chain solution and one-stop shopping. Single functions are not very attractive to the shippers, 3PLs and carriers, they not only want to use the online freight exchange to trade with their partners, but also wants sole sites to provide ASP (application service provider) based software to optimize their routing and scheduling and manage their orders and billing processes. Several consolidations and acquisitions during recent time reflects this tendency. For example, last year I2 Technology, one of the world’s largest logistics software vendors invested an online transportation service marketplace FreightMatrix to broaden its service offerings. Descartes Systems Group, a Canadian supply chain management software company bought Sameday.com after its acquisition of another online transportation service company to help it to develop online freight exchange and e-commerce fulfillment software. In addition to merging with ASPs, the online freight marketplaces are taking steps to evolve into true multi-modal transportation service providers. Logistics.com, the online transportation software and marketplace company in Cambridge Massachusetts announced several months ago the acquisition of Quoteship, an online air-cargo load-matching site and expect to provide online transportation service in air, ocean and the trucking industry in the future.

In addition to the merges and acquisitions, a more frequent action taken by the freight transportation e-businesses is to form strategic alliances with other companies to offer broader services. One of the models is to form partnership to gain multi-modal capability for both companies. One example is RightFreight.com, an air freight
transportation exchange site that teamed with NTE. Their partnership will create a seamless real-time exchange for air and ground freight used by member-based shippers, third-party logistics firms and carriers. In addition to adding value to its service and products, strategic alliances also increase access to new market channels. For instance, most recently Transportation.com, an online transportation marketplace funded by Yellow Freight Corp., has formed an alliances with the Used Equipment Network (UEN) to provide transportation services to more than 10,000 used machinery and equipment dealers worldwide.

Another observation related to this e-business evolution is that logistics expertise is at least as important as new technologies to ensure the success of online freight transportation industry. This is acknowledged by all but often ignored. Indeed, transportation is not a pure commodity, rather a service in which expertise and relationships are very important. The recent shift of top management in several online freight transportation ventures clearly demonstrated this point. Online exchanges are increasingly seeking out seasoned transportation and third party logistic professional to fill important management positions.

What recently occurred in the young online freight transportation intermediary market, including closings, new entries, consolidation and acquisition, strategic partnerships and new business models, indicates several points. The market will continue to weed out more businesses that lack of competitive advantage and a small group of dominant players will emerge; True multi-modal, one-stopping integrated service offerings will
become a necessity. In the near future, private collaborative freight exchanges may become more popular.

**Conclusion**

Freight transportation intermediaries have entered a period of rapid expansion and transformation. The number of market entrants is enormous, particularly among on-line service providers. While it is generally believed this market will continue to grow, we predict that stability will elude market for several years at least. Many companies will quickly exit the marketplace as new entrants continue to stream in. In the not too distant future a few market leaders will emerge. Observing this transition provides very interesting opportunities for researchers in many fields.

The traditional distinctions between asset and non-asset owning 3PLs are not fine enough to describe today’s intermediary industry which includes a wide variety of both asset and non-asset owning companies. Characterizing the industry in transition will be challenging and interesting. Future research should examine shipper, carrier and service providers behavior under these conditions.

The rapid development of information technologies and the e-commerce initiatives render current optimization and supply chain management tools obsolete. New optimization tools and integrated management systems as well as new business models, especially for the online brokers, will need to be developed and implemented.

During this period of change, new opportunities will emerge both for practitioners and academic researchers. Observing and participating in the near term development of e-commerce initiatives will be extremely exciting.
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