

A CONCEPTUAL STUDY ON FOURTH PARTY LOGISTICS ACTIVITIES IN TURKEY

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Abstract

Companies give importance customer satisfaction to compete the developing and changing market. This is possible when customer reach the right product, right quality, place, time and cost. In this regard the extension of logistics services have played active role on formation and development of the different logistics services concept. The concept of logistics services have played important role involved in the healing of economic indicators today. Companies can use logistics providers, thus have competitive advantage and low cost, reducing time, to be flexibility. In recent years, Fourth Party Logistics (4PL) has emerged as a new concept that includes relationship between suppliers and firms in outsourcing. 4PL provider is an integrator that offers comprehensive supply chain solutions with the technology, resources and capabilities that it possesses. Also, 4PL has attracted as a popular research topic attention in the recent past. In this paper, logistics outsourcing and 4PL concepts are analyzed and a literature review on 4PL activities is given. Also the previous studies in literature and the approaches that are used in previous studies in literature is presented by analysing on 4PL activities. In this context a field study will be applied about 4PL providers and service buyer in Turkey. If necessary, results related to this study will be shared in scientific areas.

Keywords: fourth party logistics, outsourcing, literature review

DÖRDÜNCÜ PARTİ LOJİSTİK FAALİYETLERİ ÜZERİNE KAVRAMSAL BİR ÇALIŞMA

Özet

İşletmeler, sürekli gelişen ve değişen pazarda rekabet edebilmek için müşteri memnuniyetini ön plana çıkarmaktadırlar. Bu da müşterinin doğru ürüne, doğru kalitede, doğru yerde ve doğru zamanda, doğru maliyette ulaşabilmesi ile gerçekleşmektedir. Böylelikle lojistiğin rekabetteki önemi daha da artmaktadır. Bu bağlamda, lojistik hizmetler günümüzde ekonomik göstergelerin iyileşmesinde önemli bir rol oynamaktadır. İşletmeler, küresel dünyada rekabet avantajı elde etmek, ana faaliyet alanına odaklanmak, maliyetlerini düşürmek gibi nedenlerden dolayı lojistik hizmet sağlayıcıları ile çalışmak istemektedirler. Son yıllarda dış kaynak kullanımında tedarikçiler ve firmalar arasında ilişkiyi içeren yeni bir kavram olarak Dördüncü Parti Lojistik ortaya çıkmıştır. Dördüncü parti lojistik hizmet sağlayıcısı, sahip olduğu teknoloji, kaynaklar ve yetenekleriyle kapsamlı arz zinciri çözümleri sunan bir entegratördür. Ayrıca, Dördüncü Parti Lojistik son zamanlarda popüler bir araştırma konusu olarak ele alınmaktadır. Yapılacak çalışmada, lojistik hizmetlerinin dışarıdan sağlanması ve dördüncü parti lojistik kavramı incelenmiş ve dördüncü parti lojistik uygulamaları üzerine literatür araştırması yapılmıştır. Ayrıca, dördüncü parti lojistik uygulamaları üzerine yapılan çalışmalar incelenerek; çalışmalarda kullanılan yaklaşımlar ve literatüre katkıları üzerinde durulmuştur. Bu çerçevede, dördüncü parti lojistik hizmet sağlayıcılar ve hizmet alan işletmeler açısından Türkiye'de saha çalışması yapılacaktır. Bu çalışma ile ilgili sonuçlar gerekirse bilimsel alanlarda paylaşılacaktır.

Anahtar Kelimeler: dördüncü parti lojistik, dış kaynak kullanımı, literatür araştırması

1. Introduction

Logistics is defined as the function that plans, implements and controls efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and point of consumption in order to meet customers' requirements [1].

The world has become a small village. Companies are forced to move to countries where reducing costs and selling their products to compete in the global market. Thus in such situations, the importance of logistics management will continue to increase as companies continue to outsource, widen their international trade in a global marketing environment. Today, logistics management is based on the costs as transportation, warehouse and inventory management, handling. Third Party Logistics (3PL) providers help in taking the cost out of the supply chain and also enhance the customer service level.

In fact 3PL suppliers provide logistics solutions to clients on the basis of their domain knowledge they have acquired over the years. 4PL companies provide logistics solutions built around the domain knowledge provided by third party logistics companies. Thus, 4PLs have emerged out of the vacuum created by 3PLs.

This paper presents a review of the major literature and key findings on 4PL. The proposed 4PL research classification framework is based on a comprehensive literature review, which concentrates on peer-reviewed journal papers published. This paper has identified a need for a comprehensive classification framework of 4PL studies. It essentially provides both academics and practitioners with a conceptual map of existing 4PL research and also points out opportunities for future research.

2. 4PL Providers: Definitions and Operating Models

The term 4PL was used for the first time in 1990 by Accenture in United States of America [2]. In fact, Accenture reserved this name, so other terms are also used for similar entities, such as: Logistics Integrator or Lead Logistics Provider (LLP) [3]. 4PL is an integrator that combines its own resources, potential, and technologies with those of other organizations to design, construct, and implement comprehensive solutions for the entire supply chain. 4PL firms have no physical assets like a truck or warehouse. The 4PL is an integrator that designs and manages complex supply chains that combine own resources, abilities and technology and those of other service providers [3] [4] [5]. All parties in a 4PL arrangement contribute equity and distribution assets including systems capability, strategy development and process reengineering skills [6].

4PL are developing a capability for carrying authorities, together that, when assembled, constitute the column of the network organization. It is now possible to talk about a new kind of intermediation task, which increasingly makes 4PL systematically remind "transactional centers" see them [7]. It appears that the 4PL is a joint venture between one or more business partners. It also combines the advantages of internal resource and outsourcing [8]. Analyzing the literature, however, a kind of duality in identifying the operating model of a 4PL logistics provider can be observed. It is generally defined the scope of activities provided by a successful 4PL enterprises [9]. It is stated that 4PL service providers support both physical and information flows. Besides, 4PL firms should be transparent, serve only a certain sector, have its own logistics infrastructure [4].

In today's competitive environment, 3PL focused on the actual logistics and a range of services of customer facing needs, it strives to meet the needs of enterprise customers through

comparing and integrating supply chain information; while the 4PL is emphasis on the macro management of supply chain optimization, its superiority is transformation capabilities and innovative of management ideas, its goal is optimal allocation logistics resources of regional and global according to the changing needs. In addition; 3PL providers are mainly for operational decision-making and strategic decision-making and provide 3PL implement programs to customer enterprise, and improve the function of specific supply chain, manage the transportation, warehousing and other logistics functions; 4PL logistics provider focus on strategic decisions on the whole supply chain integration. Finally, 3PL logistics provider does not have enough capacity to meet all the logistics needs of enterprise customers, which indicates that the client enterprise must be implement logistics outsourcing based on internal or external conditions [2] [10].

Saglietto (2013) has tried to determine the service scopes and characteristics of logistics service providers. By going out of this way; has made a classification on 4PL service providers. 4PL service providers can be reviewed under four headings when classified according to the specifications of the service coverage [4];

4PL of document engineering manages the large projects is therefore the design and management of technical information in the informational chain of large projects (aeronautical, naval, defense, military...). In other words, 4PLs provide relevance information, data and documents of big projects rather than physical goods [4].

4PL of logistics simulation firms are independent divisions of big consulting or software publishing companies. They are specialized in consulting and simulating global logistics solutions as transformation of computer infrastructures and trade operations, improvement the planning and organization of the logistics and supply chain using a global and integrated information system and logistics databases[4].

4PL subsidiaries of logistics groups firms are legally independent subsidiaries of a LLP and 3PL logistics companies that operating through the world. They have mission as operating the hub of a network of central purchasing departments and plants belonging to a group and with transactional platforms. It applies high-performance (secure and available) decision-making information systems to optimize the flows of transport and data through in supply chain. They provide operation to companies as consolidation of data and orders transmitted by members of the network, collection of goods from the suppliers and organization transport flows and coordination of information flows with external service providers[4].

4PL "pure players" are independent companies of large or more small size, symbolized a heterogeneous. This category of 4PL can be define using as criterias as following[4];

- 4PL supplies expertise and consulting services.
- They are pure service companies, without physical assets linked to the operation.
- Ships, planes, truck transporters or storage facilities are the owner of them.
- They manage the all flows in supply chain and optimize logistics chain by using intellectual and computer resources
- 4PL is an integrator, communicated in the deployment of their own personnel to customers for a identified period to best participate them,
- 4PL selects of sub-contractors and other service providers, transporters. They assume responsibility, in their own name or in the name of their clients, for all the contracts with service providers, suppliers and partners,
- 4PL has an international network, several subsidiaries or local offices for clients' needs,
- 4PL is a brokerage for custom activity (management of customs formalities as duties and taxes, physical control of goods etc.,
- 4PL specialized by segment, international routes, modes of transport, certain sectors and several clients,
- 4PL has a strong skill as specific information systems for real-time tracking and traceability of goods,

- 4PL orchestrates their activities in an joint way by using complex computer solutions. Also combines of own capacities and outside know-how.

Büyüközkan, Feyzioglu, Ersoy (2009) evaluated 4PL operating models in their studies. Three 4PL operating models that based on the needs and resources of all participants [11];

- **The synergy plus**

This model relies on a working relationship between the 4PL organization and a 3PL company and this alliance provides a comprehensive integrated supply chain offering. Both the 4PL and the 3PL collaborate to market supply chain solutions, which capitalize on the capabilities and market reach of both. 4PL provider would offer a wide range of services for the 3PL company (technology, supply chain strategy skills, program management, etc.) and would work within the 3PL organization[11].

- **The solution integrator**

This is known as the core 4PL model because it focuses on the strength of 4PL as an individual organization which manages a comprehensive supply chain solution for a single client. This model integrates the technology and resources of the 4PL and multiple service providers to establish an integrated supply chain solution that can deliver value for the client through out the entire supply chain[11].

- **The industry innovator**

As an industry innovator, 4PL provider improves and controls a supply chain solution for multiple sector actors. 4PL organization will focus on synchronization and collaboration between the actors in order to ensure efficiency by using technology, operational strategies and applications across the supply chain. This service model a profitable business model even though it has a complex structure. For this reason; service providers are experts in a sector and gain experience in cooperation. But they have to get service from the same service provider as their competitors can perceived negatively by customers [11].

3. 4PLs: Benefits and Solution Stages

It is stated that 4PL service procurement may become operative if businesses implement supply chain integration and adopt information technology in the supply chain [4].

The 4PL provide the solution which include reinvention, transformation, implementation and execution [12];

- **Reinvention** is the phase in which supply chain management consultancy skills are used. In this phase redesigning the system to increase supply chain performance and increasing cooperation between supply chain members.

- **Transformation** refer to specific supply chain functions such as sales, operation planning, procurement strategy and supply chain technology. transformation is a prerequisite of reinvention. This phase is critical to the success of 4PL solutions and also backed by technological leadership and strategies to improve and integrate supply chain operations.

- **Implementation** refer to business processes are rearranged. In addition, technological integration with customers, service providers and teams of 4PL conversion operations is ensured.

- **Execution** is a stage where the 4PL provider undertakes the responsibility to handle multiple supply chain functions, beyond mere transportation and warehouse management. Responsibilities of the 4PL service provider go beyond operations such as production management, procurement, demand forecasting, customer service management, inventory management, which are the responsibility of the traditional 3PL service provider. 4PL stands for outsourcing provider for all of the supply chain activities

Li, Wu, Mei (2012) mentioned the benefits that 4PL service providers maintain to businesses. These benefits are; scale economy, information technology, broad information network and flexibility [2].

First, 4PL can get lower transportation costs than other customers from transport companies or other logistics service providers. Because 4PL service providers have a high purchasing power and load capacity, they significantly reduce transportation costs.

Many 4PL companies developed internal information systems or alliances to track merchandise, carry out electronic transactions and related value-added services, maximize distribution and transportation networks, and produce reports that increase the efficiency of the supply chain. Thus, collaborating with 4PL service providers is helping businesses make the most of investment and better information technology.

With the development of professionalization, the fourth party logistics has developed a informational network and different logistics professional knowledge (such as transportation, warehousing and other value-added services). However, 4PL investment can be apportioned to many customers, therefore, on 4PL obtain the information more economically. Businesses can be transformed their fixed costs into variable costs by using outsourcing. In particular, the purchase of 4PL services provides flexibility in terms of businesses with seasonal demand changes [2].

4PL service provider maintains traceability and quality. 4PL has a comprehensive responsibility for supply chain performance. 4PL can affect the entire supply chain (increased income, falling costs, declining operating and fixed costs) [11]. In addition, by using their collaborative operational capabilities, they are helping firms to overcome difficulties by increasing their competitiveness [13].

Nowodziński (2010) explained the most important factors considered as an advantages of 4PL's. The most important factors can be listed as follows [14];

- Top management can focus on core competencies by pursue outsourcing 4PL.
- Minimizing time and effort spent on logistics
- Increasing customer service.
- Improves competitiveness.
- Diverting of risk.
- Provider is a single contact point and can manage multiple logistics providers by a single organization.
- Allows for broader supply chain services.
- top of class specialists can outsource.
- Reducing operational cost, working and fixed capital.
- Increasing revenue.
- Reduction of responsables
- The continuous observing and development of supply chain processes, performance and costs.
- The benchmarking of different supply chain processes against world-class companies.
- The continuous observing and review of service level achievements.
- The development and use of core speciality from all logistics participants.
- Simplifies the sector and sector relations environment.
- A new asset makes it easier to remove old sector relations issues and should enable the transfer of selective personnel.
- A more flexible working environment can be established.

4. 4PLs: Characteristics and Provided Services

Christopher (2005) has explained the 4PL operations; as an integrator providing a cost effective and sustainable supply chain solution, using its own information systems capability, at the same time by establishing a partnership of "best of breed" service providers [10].

Table.4.1. Four Core Components of a 4PL Provider

INTEGRATOR	CONTROL ROOM
Change leader: Supply chain visionary, multiple customer relationship, deal shaper and maker, supply chain re-engineers, project management, service, systems and information integrator, continuous innovation.	Decision-makers: Experienced logisticians, optimization engines and decision support, neutral positioning, manage multiple 3PLs, continuous improvement
SUPPLY CHAIN INFOMEDIARY	RESOURCE PROVIDER
Information: IT system integration, IT infrastructure provision, real-time data capture, convert data to information, provide info to point of need, technical support	Assets: Transportation asset provider, warehouse, cross-dock, property facility, manufacturing - outsourcing, procurement and co-packing service

Source: Christopher, M., Logistics and supply chain management: creating value-adding networks. Pearson education, 2005: 225.

As seen in Table I. talked about four talents behind 4PL. The four main competencies of the 4PL provider are described as follows [10] [15] [16];

1. Integrator : 4PL is a supply chain integrator has the competences to design and redesign a supply chain and has the needed skills to lead projects and to manage stakeholders.

2. Control Room : 4PL provider supports as a decision maker to manage the operations including management of 3PL providers and the development of specific logistics concepts for clients.

3. Infomediary : This component is deals with IT system integration, IT infrastructure provision, real-time data capture, data to information conversion, availability of information at point of need and technical support

4. Resource Provider: Focusing the necessary skills and competence in terms of asset management of a 4PL provider.

Variables related to 4PL provider's capability dimensions are examined in detail in Table 4.2.

Table.4.2. 4PL Providers Capabilities

INTEGRATOR	
Comprehensive services	It describes the different services that is offered by a 4PL service provider in a transparent manner.
Continous innovation	It illustrates different concepts (i.e. for processes) that are provided by a logistics service provider. These are innovative and ensure the continuous improvement in a humanitarian supply chain.
Management of multiple 3PL provider	Generally, 3PL provider offers transportation, warehouse capacities, IT services such as tracking and tracing etc. Therefore, a 4PLservice provider should be capable to manage multiple 3PL provider along a supply chain (i.e. transportation, warehouse capacities, freight invoices, claims etc.). Furthermore selecting the appropriate 3PL provider.

Project management	Managing project that are outsourced from HOs such as new software implementation or restructuring of accounts department or deliver reports to donor or support the HOs in preparing auditing process.
Stakeholder management	Managing stakeholder such as donor, supplier, audit agency, government or other humanitarian agencies.
Supply chain redesigner	Possessing the ability to redesign a supply chain and align it with the situation.
Supporting in mitigating risks	Supporting HOs in mitigating risks in cases of speed transportation of locally procured items or in replenishment of relief items.
RESOURCE PROVIDER	
Negotiation contracts with fuel provider	Negotiation with fuel provider to get the best prices of fuel and to always have fuel capacities.
Negotiation freight and storage contracts	Providing best transportation and warehouse prices.
Procurement and copacking service	Supporting HOs in exemplary making kits with elementary relief items for a response to a disaster or in order management.
Transportation and warehouse asset provider	It should have the capabilities to respond HOs with transportation capacities and warehouse facilities in different countries worldwide.
SUPPLY CHAIN INFOMEDIARY	
Improve communication between actor	Establishing an ICT system that improve communication and collaboration along a supply chain.
IT system integration	Allow HOs to be transparent and to standardize processes. Furthermore it ensures collaboration and increases trust between the humanitarian actors.
System and information integrator	Provision of IT systems and take responsibility during the integration of IT systems in the humanitarian supply chain. It is necessary to improve communication and coordination.
Technical support	Support HOs in using technology products or electronic as well as mechanical products.
CONTROL ROOM	
Coordination of in kind donation	Providing assistance to HOs in coordination of in kind donation worldwide.
Establishment of performance measurement system	It serves as measuring the humanitarian operations processes to promote effectiveness HOs are transparent in reporting to donors and ensure customer relationship to beneficiaries.
Establishment of a quality management	Right goods, right amount of goods and relief items to the right location to the right beneficiary in the right quality for the right price and with the right service.
Experienced Logistician	It allows the material and information flow in an efficient manner. It facilitates to provide resources also form the commercial market and to verify synergies between commercial and humanitarian supply chain sector.

Improve communication between actors (establishing logistics concept)	Generating innovative logistics concepts to support improving communication and collaboration among all actors in a supply chain.
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Source: Abidi, H., Leeuw, S.D. and Klumpp.M. "The value of fourth party logistics services in the humanitarian supply chain." *Journal of Humanitarian Logistics and Supply Chain Management* 5.1 (2015): 43.

Many researchers have studied the performance, contribution and interaction of 4PL services in different logistics activities. Some of these studies have been mentioned under the headings of the subject. Other studies with 4PL content are presented below;

Gattorna (1998) indicated that 4PL is usually a joint venture between the customer and one or more partners, and combines the benefits of outsourcing and logistics in order to provide maximum overall benefits [8].

Gökkaya (2001) made its application in a company that wants to be the first practitioner of this subject in Turkey. In the research of the study, logistics markets, processes, warehouse cost are compared [17].

Gattorna, Ogilin and Selen (2004) explored trends in 4PL logistics operations. They tried to determine the use of outsourced logistics services in the future. In this study, information about logistics activities such as duration of outsourcing, percentage of budget used, geographical usage area, scope of contracts, barriers, benefits are given [18].

Ozdemirel (2004) examined logistics services from the outside and the concept of 4PL. In this research, a questionnaire study was carried out about the outsourcing of logistics services in textile and automotive sectors in Turkey [19].

Sarıcı (2005) emphasized the importance of 4PL services and he conducted surveys to determine the awareness levels about 4PL and, whether they are in the process of transition from 3PL to 4PL of companies in the logistics sector in Turkey [20].

Boğ (2005) tried to explain the concept of 4PL and observed a services contract of a 4PL company [21].

Fulconis, Saglietto, Pache (2006) argued that 4PL service providers have created electronic links between supply chain members to fulfill their integrator role. 4PL operators have coordinated logistics operations through inter-organizational information systems [7].

Krakovics et al. (2008) conducted a study on a performance system for 4PL operators. Definition and design of the performance system were discussed in this study [22].

Cheng, Chen and Chuang (2008) focused on supply chain integration capabilities that should be evaluated in the 4PL operation selection [5].

Jensen (2012) made suggestions on how to use 4PL services to overcome the challenges in humanitarian aid logistics [23].

Mehmann, Teuteberg and Freye (2013) argued the standards expected from 4PL service providers in the agricultural sector. They have analyzed the technological and organizational characteristics of the sector and the effects of the environment [24].

Draskovic (2013) suggested strategies for outsourcing logistics services in port management and maritime transport. He also explained the 4PL service concept [25].

Zhao (2014) argued that optimization of supply chain processes, the integration and development of the port supply chain, intelligent port supply chain and green supply chain

applications by using 4PL services in port management. Thus, he added to the assumptions that customer satisfaction, increased port operation profits and helped the port achieve ecological success [26].

Selviaridis and Spring (2017) provided information on 4PL providers. In their study they found that there was a lack of information regarding the design and implementation of 4PL service contract regulations. They gave information about the contents of current studies in the literature [27].

5. Methodology

The purpose of this research to provide a taxonomy of 4PL research and, based on that, to develop a research agenda for this field of study and a complete analysis of the 4PLs community all logistic service providers operating in Turkey.

Saglietto (2013) proposed a taxonomy and a new definition that differs from the traditional definition of 4PL based on three studies. In reference to Saglietto (2013) it has been decided to use a qualitative study consisting of a detailed survey of company websites in this study. The aim of this survey is to determine the descriptions of companies' activities, their products and services and their customers.

6. Data Analysis and Findings

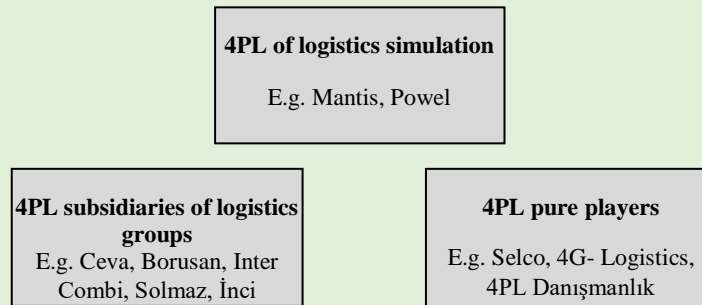
Our study covers the member lists of UND (International Transport Association of Turkey) and UTIKAD (International Association of Transport and Logistics Service Providers. UND currently has 1048 members UTIKAD has 435 members. There are 48 companies in this study. Frequencies and chi-square analyzes were performed in this study. IBM Statistical Package for the Social Sciences (SPSS) version 19.0 for Windows was used for statistical analysis of this study. Descriptive analysis is important for understanding how frequently the said phenomena exist. In this study, percentages and cumulative percentages of each demographic variable were presented in tables.

In terms of operating period of firms 41,7 percent of them were operating maximum 20 years while 25 percent of them were operating more than 61 years. In terms of firm structure, more than 50 percent of the firms were built with foreign capital. According to the chi-square test, it's determined that most of firms that were built foreign capital are operating more than 61 years. Although most of firms that were built domestic built are young that are operating maximum 20 years.

According to the frequency analysis for main activities of logistics firms, 91,7 percent of firms were providing transportation services, 83,3 percent of firms were providing warehouse management services, 81,3 percent of firms were providing supply chain management services, 77,1 percent of firms were providing supply chain consultancy services, 16,3 percent of firms were providing supply chain technology solutions.

Sampling 4PLs' customers are in a broad cross-section of the industry including chemicals, retail, automotive, textiles, metal, pharmaceuticals, e-trading, food and telecom industries. However, majority of sectors were automotive (72,7 %), retail (81,8%), pharmaceuticals (68,2%), technology (54,5%), chemical (36,4%), textile (31,8%), e-commerce (22,7).

Table 6.3. Taxonomy of 4PLs in Turkey



Source: Prepared in the light of Saglietto (2013)

The detailed analysis of the websites of these 48 4PL companies allowed us to better understand their daily activities. There were 43 firms identified as 4PL subsidiaries of logistics groups. Also 4PL service has been specified in the website of twelve firms. It's determined that the majority of firms are 4PL subsidiaries of logistics groups in Turkey. There are two firms identified as 4PL of logistics simulation. On the other hand, there are three firms identified as 4PL pure players. There are very few "pure perfect players" 4PL in Turkey.

7. Conclusion

Existing studies focus on conceptualising 4PL and pointing out its difference from 3PL, without reaching a common definition. Further, empirical research should be directed towards these phenomena, in particular [27];

- The main reasons for developing a 4PL solution,
- The reasons that 4PL supports and prevents design,
- The scope of 4PL service offering
- The structure and management of 4PL networks,
- Management of internal and interfirm change,
- extent of solution standardization and transferability,
- Profit and risk sharing in 4PL,
- The role of 4PL providers as supply chain integrator

Altogether, this paper shows that the basic concept of a 4PL in supply chain could improve and enhance efficiency and effectiveness due to an improved collaboration between the supply chain actors. In addition, there are many advantages that in working with 4PL service providers. As such our research study presents the added value of a 4PL service provider supply chain, for example make easy collaboration between supply chain actors, reducing transportation costs, increasing responsiveness, and synchronization of the logistics activities on a tactical and operational level efficiently.

Logistics activities in world and in our country are getting more important in terms of competition and sustainability.

Today, there is many 3PL logistics providers in Turkey. Turkey has enough room for the 4PL companies to flourish. Currently, there are a few companies do provide 4PL services. In order logistics firms to have a say in the world market, instead of 3PL

activities, they should follow the latest developments which required 4PL services. It can be said that in the near future 3PL providers will change rapidly to become a 4PL providers. In this study, the concept of 4PL is examined in terms of the service content, the benefits it provides to businesses, and the capabilities of service providers. In future study a field work terms of 4PL service providers and also in Saglietto (2013) methodology is based on three studies can be done in Turkey.

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