A MULTI-CRITERIA MARKET ENTRY MODEL FOR LOGISTICS SERVICE PROVIDERS: A STUDY IN NUMEROUS INDUSTRIES

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A MULTI-CRITERIA MARKET ENTRY MODEL FOR LOGISTICS SERVICE PROVIDERS: A STUDY IN NUMEROUS INDUSTRIES

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DECLARATION OF ORIGINALITY

I, Çağatay Turhan Şen, certify that

- I am the sole author of this thesis and that I have fully acknowledged and documented in my thesis all sources of ideas and words, including digital resources, which have been produced or published by another person or institution;
- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
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ABSTRACT

A Multi-Criteria Market Entry Model for Logistics Service Providers:

A Study in Numerous Industries

Logistics service providers have always been part of a company in terms of distribution, warehousing, and inventory management. In today's world, logistics service providers (LSPs) have become more than that. Increasing competition and importance of cost reduction in supply chain and logistics activities increase the prominence of LSPs, thus LSPs have become major elements instead of backup elements. From organizations' point of view, speed, cost, and flexibility became more substantial since the second half of the 20th century. So, for the purpose of better excellence against competitors, using external resources has become increasingly critical. For this reason, LSP selection is one of the most important processes of companies in the light of increase in outsourcing.

In cooperation with LSPs, firms can have important opportunities to reduce their costs and focus on their core businesses. These opportunities lead companies to use LSPs extensively, and different models exist for the LSP selection process based on expectations from LSPs. In literature, LSP selection issue is investigated as a multi-criteria decision-making consideration and many researchers have done studies on this area. The purpose of this study is creating an upgradeable model that contains criteria used by companies while selecting LSPs in order to provide knowledge about all global industries for LSPs managers. Findings gathered from literature review are supported with client contracts information from a LSP company and experiences of logistics service providers' managers.

ÖZET

Lojistik Servis Sağlayıcıları için Çok Kriterli Pazara Giriş Modeli; Çeşitli Endüstriler Üzerine Bir Çalışma

Lojistik servis sağlayıcıları, sunmuş oldukları dağıtım, depolama, envanter yönetimi hizmetleri ile her zaman firmaların vazgeçilmez bir parçaları olmuştur. Günümüz dünyasında ise lojistik servis sağlayıcıları bundan daha fazla anlam ifade etmektedir. Artan rekabet ve lojistik aktivitelerini içeren tedarik zincirinde ki maliyet azaltımı düşünceleri lojistik servis sağlayıcılarının çektiği dikkati gün geçtikçe arttırmakta ve böylelikle onları destek elemanı olmanın yanı sıra firmaların başlıca elemanlarından biri haline getirmektedir. 20. yüzyılın ikinci yarısından itibaren firmaların bakış açısına göre hız, maliyet ve esnekliğin daha önemli bir konuma gelmiş durumdadır. Bu yüzden, lojistik faaliyetlerin yürütülmesi için dış kaynaklara yönelim endüstri içerisindeki diğer aktörlere karşı büyük bir üstünlük sağlamak amacı ile çok kritik bir öneme sahip olmaktadır. Bu nedenle de dış kaynak kullanımında, lojistik servis sağlayıcısı seçim süreçleri firmaların en önemli süreçleri haline gelmiştir.

Lojistik servis sağlayıcısı iş birliği ile firmalar maliyetlerini azaltma ve kendi ana faaliyet alanlarına dikkat vermeleri gibi önemli fırsatlara sahip olabilmektedirler. Bu fırsatlar, firmaları servis sağlayıcı seçerken kendi gereksinimleri doğrultusunda oluşturdukları farklı modeller kullanmaya itmiştir. Literatürde, seçim süreçleri çok kriterli karar verme değerlendirmeleri olarak görülmüş ve üzerinde birçok araştırma yapılmıştır. Bu çalışmanın amacı ise, lojistik servis sağlayıcıları yöneticilerine bütün global sektörler hakkında bilgiler edinebilecekleri seçim sürecinde değerlendirmeye alınan kriterleri içeren geliştirilebilir bir model yaratmaktır. Literatürden bulunan

bilgiler ise, bir lojistik servis sağlayıcısının müşteri sözleşmeleri ve lojistik servis sağlayıcıları yöneticileri ile yapılmış olan röportajlar ile desteklenmektedir.

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CHAPTER 1

INTRODUCTION

Logistics, a function of supply chain management, is the management of flow of goods and services between where they originated and are stored and where they will be purchased and consumed (Lummus, Krumwiede, & Vokurka, 2001). Depending on the origin of the products, logistics involves transportation, inventory, warehousing, packaging, and sometimes security (Berglund, van Laarhoven, Sharman, & Wandel, 1999). To find out how the term logistics came up in history, we must investigate military history; for instance, Ottoman Empire wars because of their long duration. Generally, these wars were cross-continental, and it took more than a few years to reach the war field and return to the old country. In this manner, the term logistics is used in reference to how military personnel obtained, stored and moved equipment and supplies through the fields. In 1838, Antoine Henri Jominian, a Swiss military officer, defined logistics, simply, as "the art of moving armies; it comprises the order and details of marches and camps, and of quartering and supplying troops; in a word, it is the execution of strategical and tactical enterprises" in his work Summary of the Art of War. In 2013, Jasper Bernes has written that logistics will become capital's own "art of war". In today's world, logistics gains a place in global business industries, especially in mostly manufacturing industries in terms of handling and distribution of resources throughout the value chain.

In the modern era, increasing complexity of logistics activities and technological advancements generate management of logistics programs and companies that professionalize in logistics in order to simplify the logistics activities that firms handle themselves. Because of this reason, many global companies

consider outsourcing idea of logistics, that strategic use of outside parties (business independency) to perform activities traditionally handled by internal staff and resources (Skjoett-Larsen, T., 2000).

To illustrate the definition of logistics in a more comprehensive way, logistics is a business field that interests in the distribution of goods and materials which also includes services for product-oriented industries. From a professional perspective, logistics embodies the product value chain throughout suppliers to the customer in terms of integration and management. The interactions which logistics maintains are with production, design, suppliers financing information, energy, transportation, distribution, and sales (Logistics definition & example, 2019). With the expansion of global consumers' markets along with global sources of suppliers, importance of integration between production and distribution in terms of logistics is growing (Hooks, O. M., 2015).

In literature, there is a general agreement on types of logistics activities which includes warehousing, distribution-transportation, inventory-storage management, demand forecasting, material handling and packaging, customer service-communication, reverse logistics and green logistics (Gardas & Raut, 2019). Logistics service providers were previously perceived as useful for just three activities; in shortly, distribution, storage, and inventory management; however, in today's world, their services include plenty of supply chain activities for reaching the market (Shankar & Jharkharia, 2007) as illustrated in Figure 1.

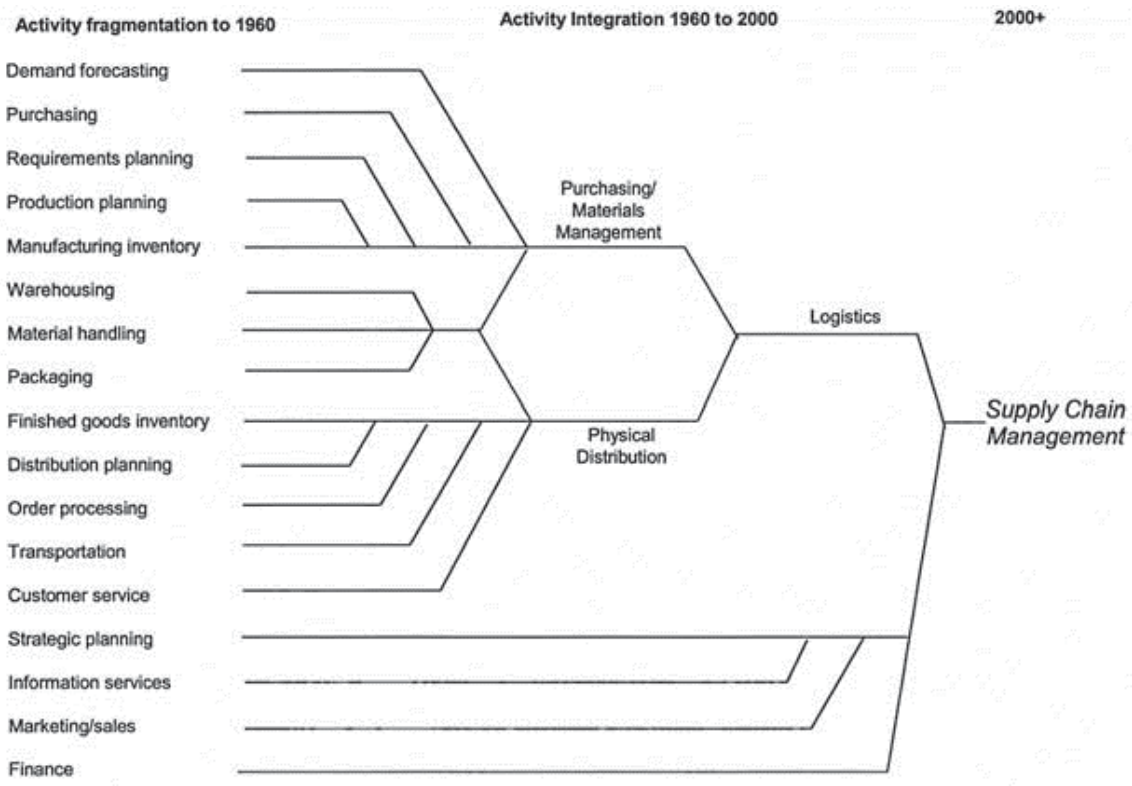

Fig. 1 Evolution of supply chain management (Ballou, R. H., 2006).

According to Hwang, Chen & Lin (2016), the list of logistics activities or business functions in today's literature can be listed as follows:

- Inbound transportation,
- Outbound transportation,
- Fleet management,
- Warehousing,
- Materials handling,
- Order fulfillment,
- Inventory management,
- Demand planning.

In today's world, technological improvements of logistics companies have become valuable for clients in terms of many aspects. The logistics industry receives much attention in terms of its many benefits, one of the most important one being

reduction of costs. Due to this, logistics industry is seen as one of the most powerful emerging industries in the twentieth century. Combining allocated resources in order to manage supply chain helps a logistics service provider (LSP) company to gain an advantage in terms of costs. Apart from cost advantage, there are other causes to consider outsourcing by companies: achieving customer service improvements, gaining access to global capability, increasing flexibility and benefitting from economies of scale, etc. Due to these benefits, companies are increasingly considering the idea of outsourcing their logistics activities to LSPs; because, with technology, LSP's are capable of effectively answering all requests demanded by their clients. In other words, with the increasing number of capabilities that LSPs achieve, more and more customers have started their outsourcing implementation processes to LSPs. Firstly, to illustrate the LSPs range of activities and services. Figure 2 shows LSPs' customer or market segmentation in terms of mode of transport, end use industry and geography.

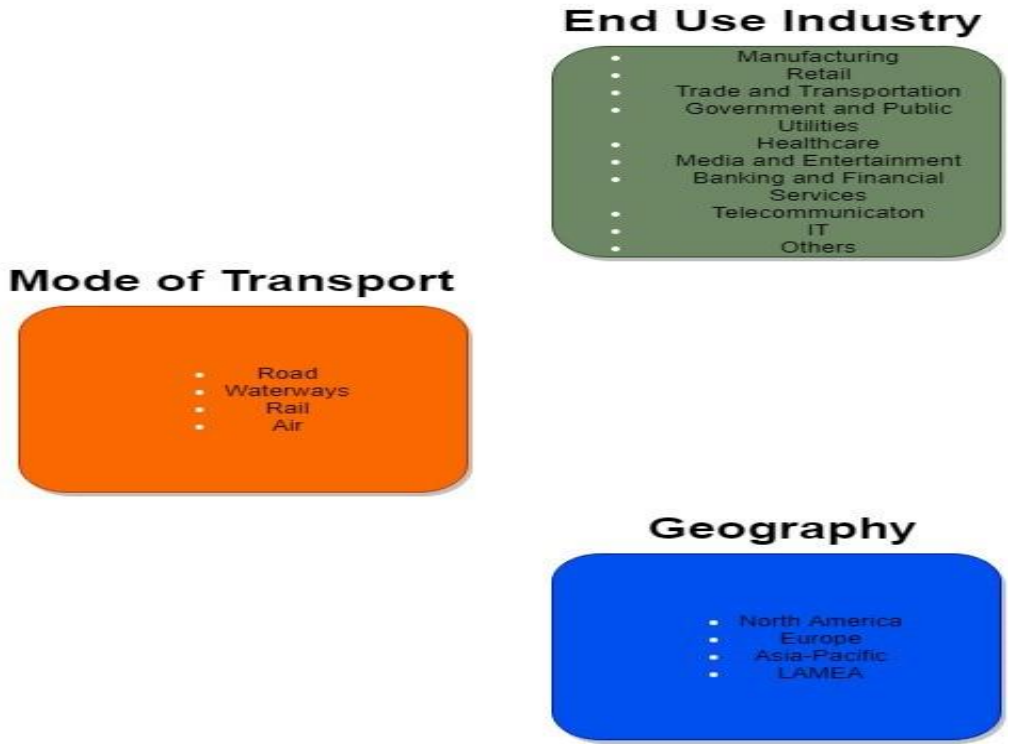

Fig. 2 LSP's ranges and activities (https://www.abnewswire.com/).

In today's business world, organizations are using logistics providers for getting in touch with their customers without making high amount of investments. In this manner, there are many reasons for using LSPs, such as professional distribution system, product returns service, information systems, cost reduction, efficiency, flexibility, and the most important one being focusing on core competencies (Lai, Ngai & Cheng, 2004). Moreover, LSPs develop their scope of services and their opportunities continuously in ways such as adopting newest technology.

As mentioned above, logistics industry has been gaining much attention. However, this attention depends on the global economic activities. External collaboration choice is mainly dependent on sustainability considerations, economic recessions and effects of globalization in terms of global economic activities. These factors increase degree of uncertainty and motivate firms to rethink the election factors. To illustrate the issue, during the recession of 2008 the selection criteria of companies for LSPs became more complicated rather than previously in terms of two concepts: are old fashioned selection factors still useful in this new business environment, and what are the most appropriate way and factors to select a logistics service provider compared to conventional ones (Alkhatib, Darlington & Nguyen, 2015).

The aforementioned questions should be considered carefully to be a more competitive firm in the market. However, in the literature, there is a lack of comprehensive and realistic work that demonstrates not only general considerations but also specific industry related conditions of industries for the progress of LSP selection. Most research only focuses on one industry and is generally empirical based, they do not have any extensive and applicable framework for the LSP selection issue which includes most of the global industries. For this reason, there is

a need for a comprehensive factual study to build an overall framework for LSP selection of firms.

While selecting LSP, there are four concepts or four steps in terms of questioning. These are selecting the useful criteria in terms of needs of the company, prioritizing criteria according to the core needs of the company, creating relationships between criteria in order to reveal core benefits of these criteria to the company and getting experts opinions (Sahu, Datta & Mahapatra, 2015). However, this kind of process like selecting-prioritizing-creating relationships between criteria takes extended period of time for managers and its consequences could be costly. Because of that, naturally, logistics managers wish to have a comprehensive model for determining and gathering factors for LSP selection, as we have tried to do in this study.

In the current literature, only a few studies include a comprehensive LSP selection model for companies/managers. Most of them are focused on just one industry and exploits the acquaintance of the writer for the industry in question. Thus, there is a lack of studies that demonstrates the general criteria of LSP selection, including considerations of companies as well as industry specific critical factors which clients seek. Another powerful benefit of the framework we propose is being an upgradeable model.

To sum up, in this study, we try to develop a framework that not only contains industry specific critical factors as well as general core criteria but can also serve as a comprehensive resource for companies. As logistics companies possess experience in various industries, in other words their customer range expands, the proposed model could be upgraded in care of managers and additional criteria could be added to the framework to upgrade this entrance model for LSPs.

A comprehensive model for managers could be very helpful in terms of costs, time, and concentration on core competencies and new business opportunities. Hence, this study seeks to fill this gap and tries to analyze the interdependent relationships between criteria and industries by means of interviews. Furthermore, this study is not solely based upon the literature or academic studies. In order for the proposed model to be more reflective of reality and applicable to business world, clients' contracts for an LSP are examined and interviews with managers and directors of a logistics company are arranged.

The rest of thesis is organized as follows. In extent of this study, there are five chapters which aim to contribute to the gap in the literature. First chapter includes an introduction to logistics industry and logistics service providers world. After that, in Chapter 2, we are going to explain our conducted literature surveys for the purpose of creating final model and clarify our aim in this study in detail. According to extent of this study, there are two literature surveys which were helpful in different ways. First survey is conducted for the purpose of creating general criteria list, and the second one is conducted for the purpose of industry specific criteria list for each industry. In the final model, these findings coming from general criteria and industry specific criteria models surveys are going to be combined to create a comprehensive framework.

Chapter 3 includes information about scope of the study. In this manner, we explained sources of final model, and introduce a logistics service provider firm that we were in touched with for the purpose of investigating clients contract archive,

and arranging interviews. In Chapter 4, we displayed and argued the findings of the study. As a beginning, general criteria that founded from literature resources explained; then, findings are discussed comprehensively. Same steps in the general criteria review are implemented for industry specific criteria review. Thirdly, findings from archive investigation of logistics service provider company are provided and discussed the importance of them. We concluded with demonstration and explanation of the outcomes of interviews with executives and visualized them in the final model.

In the last chapter, in regard to our findings in the final model, we provided a final discussion. And finalize the study with the limitations of our study, and suggestions for further studies on this study's theme.

CHAPTER 2

LITERATURE REVIEW

This chapter provides the literature review for the study. First, a literature review for the purpose of exploring the topic of thesis is conducted. Investigation included all determined global industries with the aim to detect general criteria that every kind of company would consider in the process of selecting logistics service providers (LSPs). These criteria are the building stones of the LSPs for gaining advantage in the market to be able to reach clients who are seeking LSPs in the first step, regardless of industrial conditions.

In the second step of the literature review, this time regardless of general conditions, research has been conducted for all industries in terms of their industrial conditions. To illustrate the industrial conditions, as going to be revealed by research, companies in the health industry pay foremost attention to LSP's quality of cold storage depot; from a different point of view, a company which serves in the automotive industry watches out for LSP's undamaged delivery rates, etc. These types of criteria sought after by companies could be very simple or rather complex; however, any detail no matter the criteria name is different, every one of them could be a step to move forward to gain attention of the clients. For LSP side, a manager who wants to be in these two industries has to include these capabilities and qualifications to get the contract.

Furthermore, besides literature resources, as a primary source of information about clients, contracts of an LSP company are going to be investigated especially. Because, in contracts when tender processes are done, and business has come to the contract drafting phase, both of the parties set their circumstances in terms of

operational, organizational and relevant to the field activities in the special conditions section of the contract. Thus, to be able to reach fact-based criteria, as a third step, archive of client contracts is going to be examined dividing by them through their industries.

2.1 LSPs range and activities

In today's world, demand for LSPs is rising with regards to advanced logistics services. Gürcan et al. (2016) state that "globalization, lead time reductions, customer orientation, and outsourcing are some major changes contributing to this interest in logistics". As a result, activities of logistics service providers are facing with changes in content and in complexity. New firms from different fields are entering the market competing with the traditional transport and warehousing firms (Gürcan et al., 2016). Those companies can reduce costs, optimize processes along the supply chain, and achieve higher levels of customer service, differentiating them from their competitors. To build this advantage many industries have been using LSPs as a key role to achieve their advantage. They help their customers to cut down on transaction costs through the efficient use of assets; integrating clients supply chains, and consolidation of overhead costs.

The issues of increasing focus on companies' core competencies and growing complexity of the logistics activities has driven businesses to outsourcing activities such as distribution management to LSPs. Also, cost of capital considerations such as warehouses, trucks, containers is another point that push companies to reconsider outsourcing issue. The demand of more complicated services due to globalization collaborated to the LSPs to develop a more specialized service, supporting companies with logistics needs beyond national boundaries, to include multi-modal

transport and international rules compliances (Rao & Swarup, 2011). Companies had to be efficient in their all business processes in order to maintain their competitive advantage via focusing on core competencies and outsource other functions that can be handled efficiently by third parties. In this relationship, between logistics service provider and its customers, first party is the client and second party is the LSP which logistics activities are outsourced (Hwang, Chen & Lin, 2016).

In today's world, LSPs offers a wide range of service and activities rather than basic services in order to undertake the mission of connection between parties to ensure competitive advantage for their customers in a win-win point of view. These services and functions can include traditional activities such as transporting, warehousing, and packaging, as well as less conventional activities, such as those related to custom clearance, billing, and tracking and tracing (Wambua, J. M., 2017). With technological advancements in the global word, there will be an increase of third party logistics (3PL), fourth party logistics (4PL) or fifth party logistics (5PL) services, which correspond to more technical and developed contract planning, control of network of logistics providers in order to increase efficacies and dealing with demand complexities (Wambua, J. M., 2017). In all stages of a customer's supply chain activities, logistics service provider performs solutions to add value to customer's products. In general, LSPs are tasked with minimizing supply chain risks and costs because of their experience in management of logistics partnerships and specialty in delivery activities. In other words, apart from basic logistics activities such as transportation and warehousing, an LSP's main focus is should be adding value to customer's present processes at every opportunity.

In other words, apart from traditional logistics service providers that play conventional roles in the supply chain, service providers with complementary

services can serve a large range of customers with value added services. This is called horizontal collaboration, and this led to emergence of a 4PL which has leader role in managing (Jharkharia & Shankar, 2007).

During the last twenty years, as mentioned previously, managing logistics activities via logistics service providers, in other words, outsourcing the logistics function gained a more comprehensive status for companies. On top of that, third party logistics providers have become one of the most important actors for companies to gain competitive advantage in globalized and developed world. According to Capgemini (2013), in Western Europe, 70% of the companies outsourced their logistics activities. This number is 70% in Japan and 42% in USA according to Hsiao et al., 2010. Moreover, in Asia Pacific nearly all of the companies outsource some of their logistics activities according to Hsiao et al., 2010 again. These numbers have sharply increased in the two last decades.

Wallenburg et al. (2010) considered five initial main reasons for the companies to outsource their logistics needs:

- Improvements of LSPs to optimize processes,
- Suggestions making by LSPs for development of logistics processes,
- Capability of adaptation to new situations of LSPs,
- Entrepreneurism approach of LSPs,
- Innovation activities of LSPs.

2.2 General factor literature review

In the first step of the literature review for the purpose of building general criteria model for firms' logistics outsourcing, 50 articles/works, which are from foreign sources as well as Turkish sources, have been found to conduct an inclusionary work.

Generally, in these works, authors determine their criteria by their own literature research in the literature review section and the rest of works conducted based on that model. While doing our research, we have shown an attention to factor model of the criteria as well as their years in terms of coverage. From these 50 works, we collected their criteria and explanations of them to create a spread sheet for the purpose of listing them with regards to their criteria and year published.

Literature review in this step has been conducted in the logistics industry in terms of evaluation and selection criteria as mentioned. There are plenty of journals and articles which are related with our theme from international databases such as Web of Science/Knowledge, Science Direct (Elsevier), Ebscohost Databases, Springer Link, Wiley Online Library, Pro Quest, and Google Scholar. The search was conducted using keywords such as:

- LSP selection,
- LSP evaluation,
- LSP selection and evaluation,
- Criteria for selecting LSPs.

At the beginning, a large number of articles were found. After review of abstracts and keywords of them, articles are eliminated based on logistics/industrial based decision-making criteria. Based on the articles' purposes, methods, criteria and other aspects, they could be classified in to seven groups (Alkhatib et al., 2016):

- General LSP evaluation and selection,
- LSPs evaluation and selection studies for specific industry,
- Reverse LSPs evaluation and selection,
- Integrated models for LSPs evaluation and selection,
- LSPs evaluation and selection decision under uncertainty,

- Industries needs in terms of logistics.

When conducting an in-depth literature analysis, it was observed that the most comprehensive work is done by Ho et al. (2008) which includes the reviews of 78 papers about supplier selection. The authors of this study state that “when supplier grading process is undertaken, both qualitative and quantitative factors must be considered”. In Jharkharia and Shankar (2005) study, related selection factors are determined with an analytic hierarchy process (AHP) model that contains 23 factors of selection for logistics service providers. In their results section, they mentioned that “Their approach enables the decision-makers to better understand the complex relationships of the relevant attributes in the decision-making as a guideline”.

Another work from Aguezzoul (2014) includes 67 articles published between 1994-2013 to analyze comprehensively the LSP selection problem. In terms of selection, 11 key criteria are described. Also, in terms of criteria, this article showed that LSP selection process is based on a large number of specifications offered by LSPs. From another point of view, Liu & Wang (2009), say that “the demand of third-party logistics (LSP) provider becomes an increasingly important issue for corporations seeking improved customer service and cost reduction.”. In this article as an evaluation and selection criteria, there are 26 key factors to increase companies’ competitive advantage while selecting LSPs. Furthermore, they mention that “a successful LSP provider selection plays a critical role in building the long-term relationships between the outsourcing company and a provider”.

Moreover, Alkhatib et al. (2016), tried to bring an insight to the outsourcing decision-making through investigating if the old evaluation/selection criteria and methods still fit with current business priorities. To do that, they analyzed 56 articles which are related with LSPs selection and evaluation published within 2008-2013. 12

important factors have been identified to fill the gap in logistics outsourcing study that reviews the 2008-2013 in detail. Furthermore, Hwang & Chi Shen (2015) stated that to ensure logistics efficiency, companies considerably rely on LSP suppliers to achieve supply chain excellence; however, LSP supplier selection is a complex decision-making process involving multiple selection criteria. Basically, in that article there are 16 factors used. Article presents a comprehensive decision framework about logistics service provider selection process as a major contribution and generates the importance weights of selection criteria with taking into consideration the relationships between them (Hwang & Chi Shen, 2015).

In the next steps, in conducted literature survey on 50 articles/works, we have identified 31 general factors from their tables and models. In the spreadsheet, factors are listed in rows and their publication year is listed in the column for clarity. However, as we have said, our purpose is focusing on present day conditions; so, we had to do a simplification upon them in terms of their years as can be seen in Table 1.

Table 1. Example of Classification of Years

	1	2	3	4	5	6
CRITERIA	2015	2014	2016	2014	2011	2015
Quality	2	1	2	1	1	
Price-Cost	2	1	2	1	1	2
On-Site Supply	2	1	2	1	1	2
Services	2	1		1		

We classified the resources in two groups; one group is more recent studies published between 2015-2019, the other group contains resources which are published in 2007-2014. We conducted a weighted average work for our purpose. At the beginning, every criterion had one point to the resources that contains it or no points otherwise. Later, to emphasize the importance of recent criteria, the group of

criteria scores, which belong to works published between 2015-2019, are multiplied by two as illustrated in Table 2. At the end of this practice, we gathered an evaluation table identified criteria as can be seen in the Figure 3. This table shows the shortened version and not only demonstrates the importance of criteria but also the significance of criteria to the firms in terms of being from contemporary work. Figure 3 shows the number of publications according to year published.

Table 2. Example of Classification of the Resources

	1	2	3	4	5	6	47	50	
CRITERIA	2015	2014	2016	2014	2011	2015	2019	2013	
Quality	2	1	2	1	1		2	1	64
Price-Cost	2	1	2	1	1	2	2	1	77
On-Site Supply	2	1	2	1	1	2	2	1	55
Services	2	1		1					43
Flexibility	2	1		1	1	2		1	52
Technology	2	1	2	1	1			1	64
Performance	2	1	2		1	2	2	1	48
Technic	2	1				2		1	46
Distance	2	1							4
Finance	2	1		1	1	2	2	1	64
Risk-Risk Management	2	1		1					8
Relationships	2	1	2		1	2	2	1	44

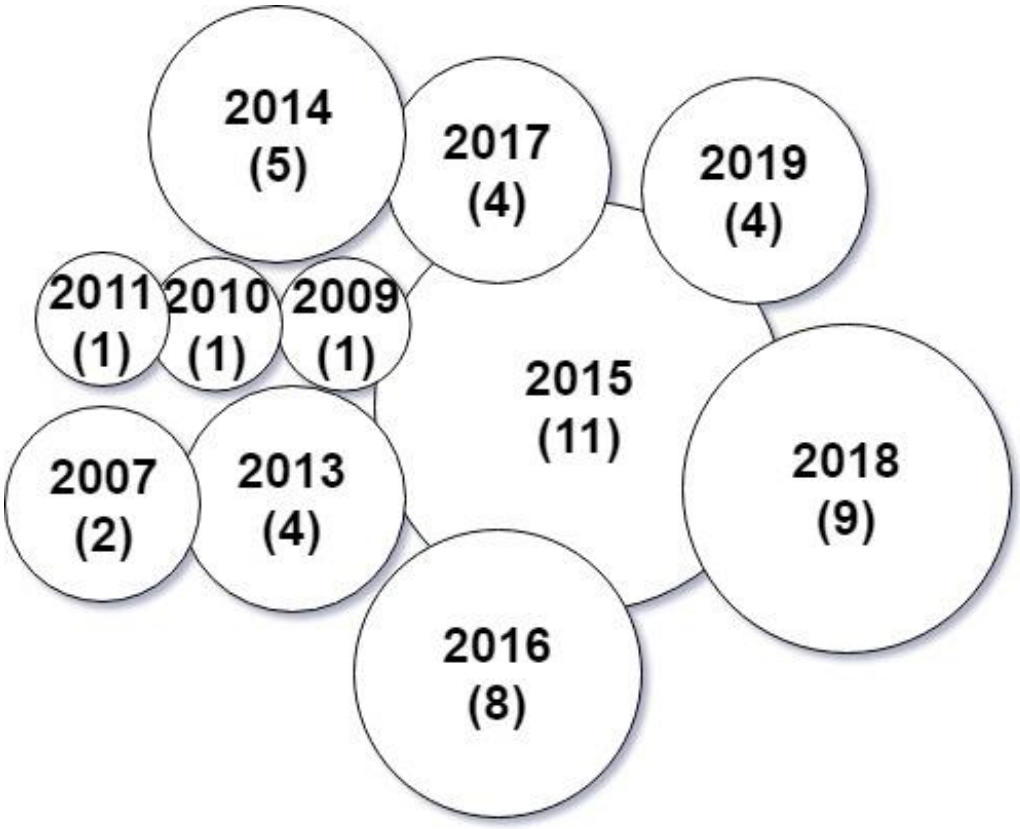

Fig. 3 Pattern of publication years of references

Once the decision has been made to work with an LSP, the forward move is to specify the best LSP to be chosen. This decision, according to our research, was taken with 23 general factors such as price/cost, quality, technology, finance, reputation etc., as are shown in the Table 2. In this work theme, we tried to organize the selection criteria in a hierarchical way to develop a multi criterion decision-making process for all companies and all industries most importantly.

However, this step of literature review is done for just one purpose which is identifying the general criteria used by companies during the selection processes of LSPs. In this study, as we mentioned, our focus is not only all industries needs but also critical needs of every industry, one by one. With that in mind, in the next section, we try to explain our next step, industry specific factor study.

2.3 Industry specific factor review

In the second step of literature survey, in addition to the guidelines of our steps in the general factor study, we tried to determine and investigate the criteria which are specific for each industry by using different searching phrases in the databases. As mentioned before, even though the general criteria model is useful and beneficial for managers to use in the real business conditions, to get to final agreement phases with clients there are some industry specific critical factors. With this objective, our investigation drilled down to each industry by using keywords such as listed below:

- Industries and LSPs (for looking industry by industry),
- Industry and selection of LSPs,
- Industry and evaluation of LSPs,
- Industry and management of LSPs.

In this manner, 63 articles/works have been found. For all of the industries, we found specific factors which will be shown in the results section in detail. For an LSP, to be a more alternative in every industry there are specific conditions that manager must acknowledge, and these would be helpful to stand out in the field. With the inclusion of these industry specific criteria, our framework is advanced and becomes a powerful source for logistics managers in the business field.

To illustrate the study with an example from one industry, Figure 4 would be helpful. In this example as we can see, in the energy industry, apart from general criteria there are specific conditions that clients pay attention to such as employment stability from the point of training costs and security of the carried goods. With this knowledge, a manager can easily please its clients with emphasizing these qualifications of the company. Validity and reliability of these terms conforms with interviewing of managers and directors from a private logistics companies; because,

unlike with the general factor studies, these kinds of works are specific and there is only a couple of them in the literature. In the next chapters, final model which is the combination of general and industry specific criteria will be shown.

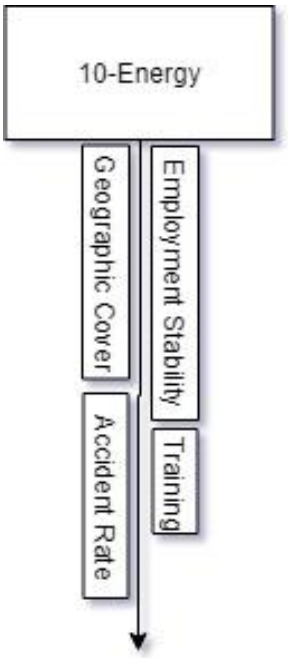

Fig. 4 Example from industry specific criteria model

2.4 Problem statement

Factors like globalization, technology, and increasing competitiveness of conditions in logistics industry, and the ever-increasing demand and expectation of the customers from logistics service providers make it an obligation for the firms to reconsider their structural situations to be able to survive in logistics industry. The fact that the LSPs demand to reach new markets in the world with the increase of globalization enabled the logistics industry to grow in a rapid pace. Since most companies nowadays view logistics activities as one of the most important items in terms of competitiveness and cost effectiveness, in the current economic conditions,

it has been mandatory that firms deal with their own area of specialty and for other activities hire outsourcing firms.

The above requirements create the need to generate a comprehensive framework for logistics service providers to be successful in this competitive industry by including general conditions and industry specific conditions. In this study, it was aimed that to create a framework for identifying the most compatible logistics service provider firm in global industries in terms of entrance considerations and criteria. Criteria have been identified for the LSPs comprise a multi-criteria entrance framework and these criteria have been exploited by managers for preparing their activities to enter new industries in global world in terms of qualifying their companies to those criteria of related industries.

CHAPTER 3

SCOPE OF STUDY

The objectives of this research may be described as explanatory. The study was limited to 13 global industries and could be useful for all logistics service providers as well as their customers. In this study, we aim to investigate the factors relevant to relationship between LSPs and customers, and demonstrate those criteria that are expectations of customers from LSPs in today's world. Apart from this issue, we also have tried to clarify the conditions of LSPs in terms of these expectations. As competition has dramatically increased in the logistics industry with regards to optimization and usage of LSPs, improvements in technology and service requirements have come into the picture.

From another point of view, as a broader aim we have tried to determine which criteria identified by literature are really making their impact in real life LSPs selection decisions. Once the criteria are identified, our motivation is to provide LSPs industry-specific criteria to improve themselves in terms of expanding their scope of services and to be more competitive in a sector through increasing their awareness about expectations of customers.

With regards to work experience in logistics industry, the main criteria that makes an LSP as pioneer in the industry is closeness to new technological improvements. As practices of optimization studies have increasing reputation nowadays, it is important that an LSP monitors technological advancements in the world. When we have taken into consideration pioneer companies of logistics industry, importance of technology emerges.

In the first stage as can be seen in the Figure 5, the study starts with general factor review to identify the most common criteria used in LSP selection processes

by clients. General criteria refer to the functions that an LSP has to possess in their structure to be compatible with acceptable elementary standards in the industry. Our aim in this stage is to propose a model for the purpose of demonstrating how a standard LSP should be structured in today's conditions.

After that, study continues with second stage, which is industry specific criteria reviews to find the criteria used in LSP selection process which are unique for related industry. Industry specific criteria refer to the functions that an LSP has to possess to be compatible and become a successful role player with unique standards which are mandatory for the related industry. Our aim in this stage is propose a road-map to LSPs for the purpose of how can an LSP enter specific industries, and propose key criteria so as to be successful in these industries.

Following this, client contracts of an LSP provider were investigated to determine criteria related to the issue. Importance of client contracts is convergence to real industrial conditions rather than academically investigations. They are strict expectations from an LSP by clients, to be performed correctly during the life-time of contract. In this stage, we have intended to increase the reliability and applicability to our criteria model for the purpose of implementing in real life.

In the last part of the study, interviews are conducted with executives of a logistics service provider company. Interviews are conducted for the purpose of getting approval for the determined criteria in terms of their importance and usefulness according to industrial experience of executives. From our point of view, this is the most important part in our study; because, the most significant accordance with real industry circumstances is coming from this stage of this study.

At the end of study with the final model design stage, our aim is to create a framework that could be used by LSPs to develop themselves according to standards

and expectation of industries. From another point, as our main motivation, we intend to contribute to the logistics industry with the purpose of increasing quality standards and increasing the competitiveness of LSPs in the industry.

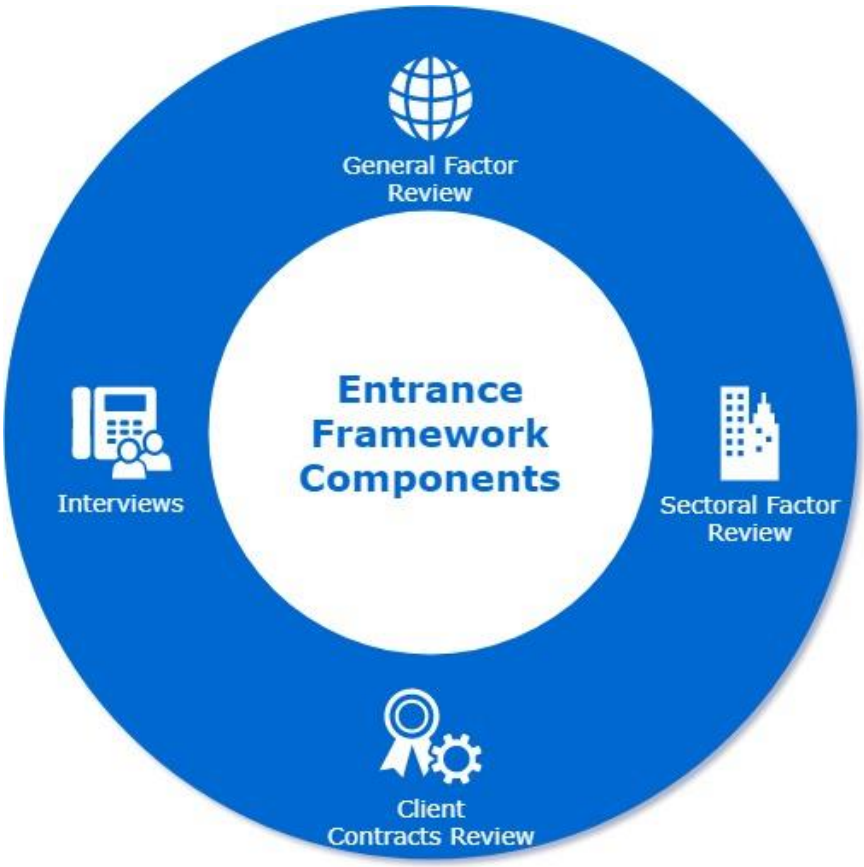

Fig. 5 Stages of study

In the study, we have investigated electric-electronic, textile, automotive, furniture, mining, petro-chemical, agriculture, paper-based products, home appliances, energy, health, food and beverage, and construction industries. These industries are chosen for the purpose of generalizing our findings (criteria) to implement worldwide, as these are the most important and leading industries in today's world.

For each industry, we tried to find criteria from literature, contracts and interviews together. In client contracts review and interviews we have benefitted from a logistics service company which was founded in 2000. Company offers special logistics solutions with slogan of competitive logistics solutions in Turkey.

Company has approximately 1.100 employees, a fleet of more than 200 trucks, and more than 50 logistics centers around Turkey. Business fields covered by the company are contract logistics with more than 120.000 sqm of warehouse capacity, road freight, air freight, sea freight, and railway transportation, special services (oil & gas, car transportation, chilled transportation).

Interviews were conducted with one warehouse manager, one logistics center manager, research and development director, and distribution director of this company. Three of four interview participants have their work experience only in logistics industry. Because of this reason, their knowledge which is used in the approval of criteria stage is very valuable for this study. Moreover, each interviewee has more than five years of experience in their company; so all information that has been gathered from them is based on logistics industry experience.

CHAPTER 4

RESULTS

In this chapter, we are going to demonstrate our research findings, and discuss them in terms of their contribution to the literature. Then, we are going to show the findings of client contracts review. Furthermore, we are going to summarize the conducted interviews with professionals based on their final model contributions. Lastly, we will present final model with all details and discuss it at length.

4.1 General factor review and results

As mentioned in the previous section, for the first step of this thesis we have conducted a comprehensive literature review for the purpose of creating a general criteria model for firms, based on 50 research works. By means of general criteria, we tried to determine the factors that are fundamental of any logistics service provider who is in action in the logistics industry.

The expected benefit of this general criteria model is that even if a manager or director does not know the requirements of an industry, this model will be helpful to acknowledge the basic but important criteria. As stated previously, in the last two decades, the number of LSPs have increased vastly and this expansion makes the market more competitive. Technological advancements along with increasing experience in logistics activities makes the market harder to gain new customers and reach the projected numbers in terms of qualifications.

In the light of the aforementioned aspects, we have constructed a model that includes general factors that companies expect from their logistics service providers. These are not additional criteria to be favored among others; these criteria must be

possessed by the LSPs in order to serve as a logistics service provider for a client and successfully handle activities requested by them.

In the comprehensive literature survey conducted to reveal the general criteria for 3PL/LSP selection, 31 criteria were found in various studies. These studies were chosen with the purpose of including not only the Turkish case but also global conditions. To explain the path followed, our resources are divided to two parts, one originates from Turkish companies' studies, the other from foreign ones. This enables us to present criteria that can be implemented in many locations. Moreover, resources' publish dates set light to demonstrate the general criteria model. The resources' publish dates range between 2007 and 2019 (as shown in Figure 3). This allows us to include past as well as more recent criteria.

To reflect the contemporary perspective better, more recent publications were given a grading process. We divided our finding resources into two groups in order to emphasize the importance of more recent criteria. First group is work published between 2007-2015 - the criteria which we have found from these resources were weighted by one point; and the second group is work published in the last five years, between 2015-2019 - the criteria which we have found from these resources were weighted by two points. In this way, we tried to execute a grading process which assigns higher significance to more recent research. The results are presented in Table 3. Lists of general criteria review resources are shown in the Table 4, Table 5, and Table 6. Moreover, in Table 7, chosen criteria are shown.

Table 3. List of General Criteria Resources

	RESOURCE NUMBER																																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
CRITERIA	2015	2014	2016	2014	2011	2015	2018	2014	2018	2018	2014	2017	2015	2013	2013	2016	2016	2018	2018	2010	2017	2013	2014	2007	2016	2016	2016	2018	2018	2019	2016	2015	2015	2015	2018	2017	2019	2016	2015	2018	2015	2015	2015	2019	2017	2015	2019	2009	2007	2013	
Quality	2	1	2	1	1		2	1	2	2	1	2	2	1	1	2	2	2	2			1	1			2	2		2	2	2		2	2	2	2		2	2	2	2	2					2	1	1	1	64
Price-Cost	2	1	2	1	1	2	2	1	2	2	1	2	2	1	1	2	2		2	1	2		1	1	2	2	2	2	2		2	2	2	2	2		2	2	2	2	2	2	2	2		2	2	1	1	1	77
On-Site Supply	2	1	2	1	1	2		1		2	1	2	2		1	2	2	2	2				1		2	2	2		2				2	2	2	2	2	2				2	2				2	1		1	55
Services	2	1		1				1					2	1	1		2		2	1		1	1	1	2	2	2		2	2		2		2	2	2	2				2	2			2						43
Flexibility	2	1		1	1	2	2	1	2		1	2				2	2		2		2		1		2		2	2		2	2	2	2			2	2		2	2		2			2				1	1	52
Technology	2	1	2	1	1		2	1		2	1	2		1		2	2			1	2		1	1	2		2	2	2	2	2	2		2		2	2	2	2	2	2	2	2		2	2		1	1	1	64
Performance	2	1	2		1	2	2		2		1	2			1			2	2		2	1							2		2	2	2	2	2			2				2	2			2	2	1	1	1	48
Technic	2	1				2	2			2				1	1		2	2		1				1		2	2					2	2	2		2	2	2	2	2				2	2	2		1	1	1	46
Distance	2	1													1																																				4
Finance	2	1		1	1	2	2	1	2	2		2			1		2	2					1	1	2	2	2			2	2	2	2	2	2	2	2	2	2	2			2	2	2	2	2	1	1	1	64
Risk-Risk Management	2	1		1			2					2																																							8
Relationships	2	1	2		1	2	2	1	2	2			2					2				1	1	1			2	2	2	2	2					2	2				2				2		2		1	1	44
Innovation	2	1	2													2										2		2					2	2			2	1	1		2							1			22
Profile	2	1			1	2	2					2										1		1										2			2							2			2		1		21
Facilities/Plants	2	1		1		2	2			1					1			2										2	2			2																			18
Guarantee/Policies		1																										2																							3
Compliance with Procedures		1																												1																					2
Reputation		1	2		1	2	2					2		1					2		2	1	1	1	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2			2	2	2	2	2	1	1	1	61
Eagerness		1				2												2						1		2					2								2							2	2		1		17
Management and Organization		1		1	1	2	2	1	2	2	2					2	2	2		1	2		1	1	2	2	2		2		2	2	2			2	2						2			2		1	1	1	50
Operational Controls		1								2																		2			2							2													9
Workforce Relationships		1			1					2																											2														6
Location		1	2	1	1		2	1		2	2			1			2	2	2		2		1	1	2		2				2					2	2							2				1	1		37
Experience		1	2	1		2	2			2	2	2		1	1		2	2	2	1	2			1	2	2					2			2			2	2	2			2	2	2	2	2		1	1	1	53
Customer Services				1	1				2	2	2			1										1	2	2						2	2	2	2		2	2				2						1			29
Security				1		2		1										2								2		2	2	2			2	2	2					2			2	2	2		2			1	31
Waste Management				1		2																							2	2					2																9
Improvement					1				2	2														1		2		2	2	2			2	2			2	2	2	2	2	2	2				2	1			35
Certification					1	2				2					1															2																					8
Capacity		1	2	1	1	2		1		2				1	1		2	2		1	2				2	2		2	2	2	2	2					2	2	2				2	2	2	2	2		1	1	51
Environment Policy								1																					2	2		2			2				2	2		2		2							17

Table 4. List of General Criteria Resources Details (1-19)

Number	Year	Authors	Source
1	2015	Özer, S., Miman, M., & Taştan, M. B.	TR62 Bölgesinde Faaliyet Gösteren Gıda Şirketlerinin Tedarikçi Seçimi Yöntemleri. Proceedings from IV Ulusal Lojistik ve Tedarik Zinciri Kongresi, 21-23.
2	2014	Ofluoğlu, P., & Miran, B.	Ofluoğlu, P., & Miran, B. (2014). Bulanık Mantık Yöntemiyle En iyi Tedarikçi Seçimi Sorunu: Türkiye'deki Hazır Giyim Firmalarına Yönelik Bir Uygulama Çalışması. Journal of Textiles and Engineer, 4.
3	2016	Özder, E. H., & Tamer, Eren.	Özder, E. H., & Tamer, Eren. (2016). Çok Ölçütlü Karar Verme Yöntemi ve Hedef Programlama Teknikleri ile Tedarikçi Seçimi. Selçuk Üniversitesi Mühendislik, Bilim ve Teknoloji Dergisi, 4(3), 196-207.
4	2014	-	Depolama Faaliyetleri için LSP Seçiminde Önemli Değerlendirme Kriterlerinin Belirlenmesi - 2014 - Uluslararası Yönetim-İktisat ve İşletme Dergisi, Cilt 10.
5	2011	Gümüşay Şahin, A., & Berberoğlu, N.	Gümüşay Şahin, A., & Berberoğlu, N. (2011). Lojistik Outsourcing Karar Süreci ve 3PL Firma Seçim Kriterleri.
6	2015	Cetin, O., & Önder, E.	Cetin, O., & Önder, E. (2015). Tedarikçi Seçiminde Analitik Ağ Süreci Yönteminin Kullanilmasi (Using Analytic Network Process Method for Supplier Selection). ÇETİN, O. ÖNDER E.(2015)"Using Analytic Network Process Method For Supplier Selection" The Journal of KAU IIBF, 6(10), 335-354.
7	2018	Korucuk, S.	Korucuk, S. (2018). Soğuk Zincir Taşımacılığı Yapan İşletmelerde 3PL Firma Seçimi: İstanbul Örneği. Igdir University Journal of Social Sciences, (16).
8	2014	Demirtaş, Ö., & Akdoğan, A.	Demirtaş, Ö., & Akdoğan, A. Bulanık Ortamda Tedarikçi Seçimi: Savunma Sanayii'ne Yönelik Bir Uygulama. Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, (43), 203-222.
9	2018	Supçiller, A. A., & Deligöz, K.	Supçiller, A. A., & Deligöz, K. (2018). Tedarikçi Seçimi Probleminin Çok Kriterli Karar Verme Yöntemleriyle Uzlaşık Çözümü. Uluslararası İktisadi ve İdari İncelemeler Dergisi, 355-368.
10	2018	Kerkhoff, E.	Kerkhoff, E. (2018). Çok Kriterli Karar Verme Yöntemleriyle Tedarikçi Seçimi (Master's thesis, İstanbul Ticaret Üniversitesi).
11	2014	Karaağaçlı, Y.	Karaağaçlı, Y. (2014). Üçüncü Parti Tersine Lojistik Sağlayıcı Firma Seçimi ve Değerlendirilmesine Yönelik Bütünleşik Model Tasarımı (Doctoral dissertation, Fen Bilimleri Enstitüsü).
12	2017	Güzel, D., Tüzemen, A., & Yaprak, B.	Güzel, D., Tüzemen, A., & Yaprak, B. (2017). Firmaların 3PL (Üçüncü Parti Lojistik) Hizmet Sağlayıcılarını Seçerken Kullandıkları Kriterler Üzerine Bir çalışma: Erzurum İhracatçıları Örneği. Ataturk University Journal of Economics & Administrative Sciences, 31(3).
13	2015	Şimşek, A., Çatır, O., & Ömürbek, N.	Şimşek, A., Çatır, O., & Ömürbek, N. (2015). Topsis VE Moora Yöntemleri ile Tedarikçi Seçimi: Turizm Sektöründe Bir Uygulama. Balikesir University Journal of Social Sciences Institute, 18(33).
14	2013	Baynal, K., & Yüzügüllü, E.	Baynal, K., & Yüzügüllü, E. (2013). Tedarik zinciri yönetiminde analitik ağ süreci ile tedarikçi seçimi ve bir uygulama. Istanbul University Journal of the School of Business Administration, 42(1).
15	2013	Çakın, E., & Özdemir, A.	Çakın, E., & Özdemir, A. (2013). Tedarikçi Seçim Kararında Analitik Ağ Süreci (ANP) ve Electre Yöntemlerinin Kullanılması ve Bir Uygulama. Afyon Kocatepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 15(2), 339-364.
16	2016	Günay, Z., & Ünal, Ö. F.	Günay, Z., & Ünal, Ö. F. (2016). AHP-TOPSIS Yöntemi ile Tedarikçi Seçimi (Bir Telekomünikasyon Şirketi Örneği). PESA Uluslararası Sosyal Araştırmalar Dergisi, 2(1), 37-53.
17	2016	Özbek, A.	Özbek, A. (2016). Tedarikçi Seçiminde Çok Kriterli Karar Verme Yöntemlerinin Kullanılması. Anadolu Üniversitesi Sosyal Bilimler Dergisi, 16(1).
18	2018	Yücel, Y. B.	Yücel, Y. B. (2018). Çok Kriterli Karar Verme Teknikleri ile Tekstil Sektöründe En Uygun Tedarikçi Seçimi ve Bir Yazılım Uygulaması (Master's thesis, Bartın Üniversitesi, Sosyal Bilimler Enstitüsü).
19	2018	-	Journal of Engineering and Science (APJES)

Table 5. List of General Criteria Resources Details (20-36)

Number	Year	Authors	Source
20	2010	-	29.Türkiye Muhasebe Eğitimi Sempozyumu.
21	2017	Tamer, Eren., & Seyda, Gür.	Tamer, Eren., & Seyda, Gür. (2017). Online Alışveriş Siteleri için AHP ve Topsis Yöntemleri ile 3PL Firma Seçimi. Hitit Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 10(2), 819-834.
22	2013	Tamer, Eren., & Özbek, A.	Tamer, Eren., & Özbek, A. (2013). Analitik Ağ Süreci Yaklaşimiyla Üçüncü Parti Lojistik (3pl) Firma Seçimi. Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, 27(1), 95-113.
23	2014	Aguezzoul, A.	Aguezzoul, A. (2014). Third-Party Logistics Selection Problem: A Literature Review on Criteria and Methods. Omega, 49, 69-78.
24	2007	Göl, H., & Çatay, B.	Göl, H., & Çatay, B. (2007). Third-Party Logistics Provider Selection: Insights From A Turkish Automotive Company. Supply Chain Management: An International Journal, 12(6), 379-384.
25	2016	Govindan, K., Khodaverdi, R., & Vafadarnikjoo, A.	Govindan, K., Khodaverdi, R., & Vafadarnikjoo, A. (2016). A Grey DEMATEL Approach to Develop Third-Party Logistics Provider Selection Criteria. Industrial Management & Data Systems, 116(4), 690-722.
26	2016	Hwang, B. N., Chen, T. T., & Lin, J. T.	Hwang, B. N., Chen, T. T., & Lin, J. T. (2016). 3PL Selection Criteria in Integrated Circuit Manufacturing Industry in Taiwan. Supply Chain Management: An International Journal, 21(1), 103-124.
27	2016	Aguezzoul, A., & Pires, S.	Aguezzoul, A., & Pires, S. (2016, April). 3PL Performance Evaluation and Selection: A MCDM Method. In Supply Chain Forum: An International Journal (Vol. 17, No. 2, pp. 87-94). Taylor & Francis.
28	2018	Singh, R. K., Gunasekaran, A., & Kumar, P.	Singh, R. K., Gunasekaran, A., & Kumar, P. (2018). Third Party Logistics (3PL) Selection for Cold Chain Management: A Fuzzy AHP and Fuzzy TOPSIS Approach. Annals of Operations Research, 267(1-2), 531-553.
29	2018	Mathiyazhagan, K., & Bhalotia, A.	Mathiyazhagan, K., & Bhalotia, A. (2018). Assessment of Criteria for The Selection of Third Party Logistics Provider: A Case from India. International Journal of Logistics Systems and Management, 30(2), 268-282.
30	2019	Gardas, B. B., D. Raut, R., & Narkhede, B. E.	Gardas, B. B., D. Raut, R., & Narkhede, B. E. (2019). Analysing the 3PL Service Provider's Evaluation Criteria Through A Sustainable Approach. International Journal of Productivity and Performance Management.
31	2016	Sasananan, M., Narkhede, B. E., Gardas, B. B., & Raut, R. D.	Sasananan, M., Narkhede, B. E., Gardas, B. B., & Raut, R. D. (2016). Selection of Third Party Logistics Service Provider Using A Multi-Criteria Decision Making Approach for Indian Cement Manufacturing Industries. Science & Technology Asia, 70-81.
32	2015	Cirpin, B. K., & Kabadayi, N.	Cirpin, B. K., & Kabadayi, N. (2015). Analytic Hierarchy Process in Third-Party Logistics Provider Selection Criteria Rvaluation: A Case Study in IT Distributor Company. International Journal of Multidisciplinary Sciences and Engineering, 6(3), 1-6.
33	2015	Alkhatib, S. F., Darlington, R., & Nguyen, T. T.	Alkhatib, S. F., Darlington, R., & Nguyen, T. T. (2015). Logistics Service Providers (LSPs) Evaluation and Selection: Literature Review and Framework Development. Strategic Outsourcing: An International Journal, 8(1), 102-134.
34	2015	Hwang, B. N., & Shen, Y. C.	Hwang, B. N., & Shen, Y. C. (2015). Decision Making for Third Party Logistics Supplier Selection in Semiconductor Manufacturing Industry: A Nonadditive Fuzzy Integral Approach. Mathematical Problems in Engineering, 2015.
35	2018	Zarbakhshnia, N., Soleimani, H., & Ghaderi, H.	Zarbakhshnia, N., Soleimani, H., & Ghaderi, H. (2018). Sustainable Third-Party Reverse Logistics Provider Evaluation and Selection Using Fuzzy SWARA and Developed Fuzzy COPRAS in The Presence of Risk Criteria. Applied Soft Computing, 65, 307-319.
36	2017	Karrapan, C., Sishange, M., Swanepoel, E., & Kilbourn, P. J.	Karrapan, C., Sishange, M., Swanepoel, E., & Kilbourn, P. J. (2017). Benchmarking Criteria for Evaluating Third-Party Logistics Providers in South Africa. Journal of Transport and Supply Chain Management, 11(1), 1-10.

Table 6. List of General Criteria Resources Details (36-50)

Number	Year	Authors	Source
37	2019	Asian, S., Pool, J. K., Nazarpour, A., & Tabaeeian, R. A.	Asian, S., Pool, J. K., Nazarpour, A., & Tabaeeian, R. A. (2019). On the Importance of Service Performance and Customer Satisfaction in Third-Party Logistics Selection: An Application of Kano Model. Benchmarking: An International Journal.
38	2016	Abbas Shojaie, A., Soltani, A. R., & Soltani, M. R.	Abbas Shojaie, A., Soltani, A. R., & Soltani, M. R. (2016). A Fuzzy Integrated Approach for Evaluating Third-Party Logistics. International Journal of Modeling and Optimization, 6(4), 206.
39	2015	Wang, J. J., Wang, M. M., Liu, F., & Chen, H.	Wang, J. J., Wang, M. M., Liu, F., & Chen, H. (2015). Multistakeholder Strategic Third-Party Logistics Provider Selection: A Real Case in China. Transportation Journal, 54(3), 312-338.
40	2018	Chen, W., Goh, M., & Zou, Y.	Chen, W., Goh, M., & Zou, Y. (2018). Logistics Provider Selection for Omni-Channel Environment with Fuzzy Axiomatic Design and Extended Regret Theory. Applied Soft Computing, 71, 353-363.
41	2015	Wang, Q., & Lv, H.	Wang, Q., & Lv, H. (2015). Supplier Selection Group Decision Making in Logistics Service Value Cocreation Based on Intuitionistic fuzzy sets. Discrete Dynamics in Nature and Society, 2015.
42	2015	Vahdani, B.	Vahdani, B. (2015). An Artificial Intelligence Model Based on LS-SVM for Third-Party Logistics Provider Selection. International Journal of Industrial Mathematics, 7(4), 301-311.
43	2015	Yayla, A. Y., Oztekin, A., Gumus, A. T., & Gunasekaran, A.	Yayla, A. Y., Oztekin, A., Gumus, A. T., & Gunasekaran, A. (2015). A Hybrid Data Analytic Methodology for 3PL Transportation Provider Evaluation Using Fuzzy Multi-Criteria Decision Making. International Journal of Production Research, 53(20), 6097-6113.
44	2019	Govindan, K., Agarwal, V., Darbari, J. D., & Jha, P. C.	Govindan, K., Agarwal, V., Darbari, J. D., & Jha, P. C. (2019). An Integrated Decision Making Model for The Selection of Sustainable Forward and Reverse Logistic Providers. Annals of Operations Research, 273(1-2), 607-650.
45	2017	Garside, A. K., & Saputro, T. E.	Garside, A. K., & Saputro, T. E. (2017, November). Evaluation and Selection of 3PL Provider Using Fuzzy AHP and Grey TOPSIS in Group Decision Making. In AIP Conference Proceedings (Vol. 1902, No. 1, p. 020056). AIP Publishing.
46	2015	Sharma, S. K., & Kumar, V.	Sharma, S. K., & Kumar, V. (2015). Optimal Selection of Third-Party Logistics Service Providers Using Quality Function Deployment and Taguchi Loss Function. Benchmarking: An International Journal, 22(7), 1281-1300.
47	2019	Alikhani, R., Torabi, S. A., & Altay, N.	Alikhani, R., Torabi, S. A., & Altay, N. (2019). Strategic Supplier Selection Under Sustainability and Risk Criteria. International Journal of Production Economics, 208, 69-82.
48	2009	Liu, H. T., & Wang, W. K.	Liu, H. T., & Wang, W. K. (2009). An Integrated Fuzzy Approach for Provider Evaluation and Selection in Third-Party Logistics. Expert Systems with Applications, 36(3), 4387-4398.
49	2007	Jharkharia, S., & Shankar, R.	Jharkharia, S., & Shankar, R. (2007). Selection of Logistics Service Provider: An Analytic Network Process (ANP) Approach. Omega, 35(3), 274-289.
50	2013	Datta, S., Samantra, C., Sankar Mahapatra, S., Mandal, G., & Majumdar, G.	Datta, S., Samantra, C., Sankar Mahapatra, S., Mandal, G., & Majumdar, G. (2013). Appraisement and Selection of Third Party Logistics Service Providers in Fuzzy Environment. Benchmarking: An International Journal, 20(4), 537-548.

Table 7. List of Criteria

Price/Cost	77
Quality	64
Technology	64
Finance	64
Reputation	61
On-Site Supply	55
Experience	53
Flexibility	52
Capacity (Tech/Equipment)	51
Management/Organization/Professionalism	50
Performance	48
Technic Capacity (IT)	46
Relationships/Communicaton	44
Service	43
Location	37
Improvement	35
Security/ISG	31
Customer Services	29
Innovation	22
Profile of Company	21
Facilities/Plants	18
Eagerness	17
Environment Policy	17
Operational Controls	9
Waste Management	9
Risk-Risk Management	8
Sertification	8
Workforce Relationships	6
Distance	4
Guarantee/ Policies	3
Compliance with Procedures	2

Additionally, in order to simplify and clarify the model and the terms, we proceeded to eliminate criteria from this list that have not received too much attention in comparison to the other criteria in literature. In order to accomplish this objective, we used percentile method with specified the percentage as 30%. The aim was to remove the bottom 30 percent of criteria and this corresponds to number 17. As we can see from Table 7, criteria that have a grade of 17, and we have colored with turquoise and these will be kept in the model. Criteria that have a grade of

below 17 are colored yellow and will not enter the model. At the end, 31 factors extracted from our resources have been reduced to 23 criteria.

These 23 criteria have been selected to create a model for LSPs to understand the requirements of logistics industry not only to be able to survive, but also to be a rising company in today's developing and competitive market conditions. These findings represent the fundamentals of research articles about 3PL/LSP selection and evaluation criteria; each of them includes most of these factors as a way to study the logistics industry and possible demands of customers This model is the focus of our study, and other remaining parts of this thesis are going to be shaped by it. Final dimensions of our model are shown in Figure 6. The definitions of all criteria and their relevance in logistics as defined in previous research is presented in Table 8.

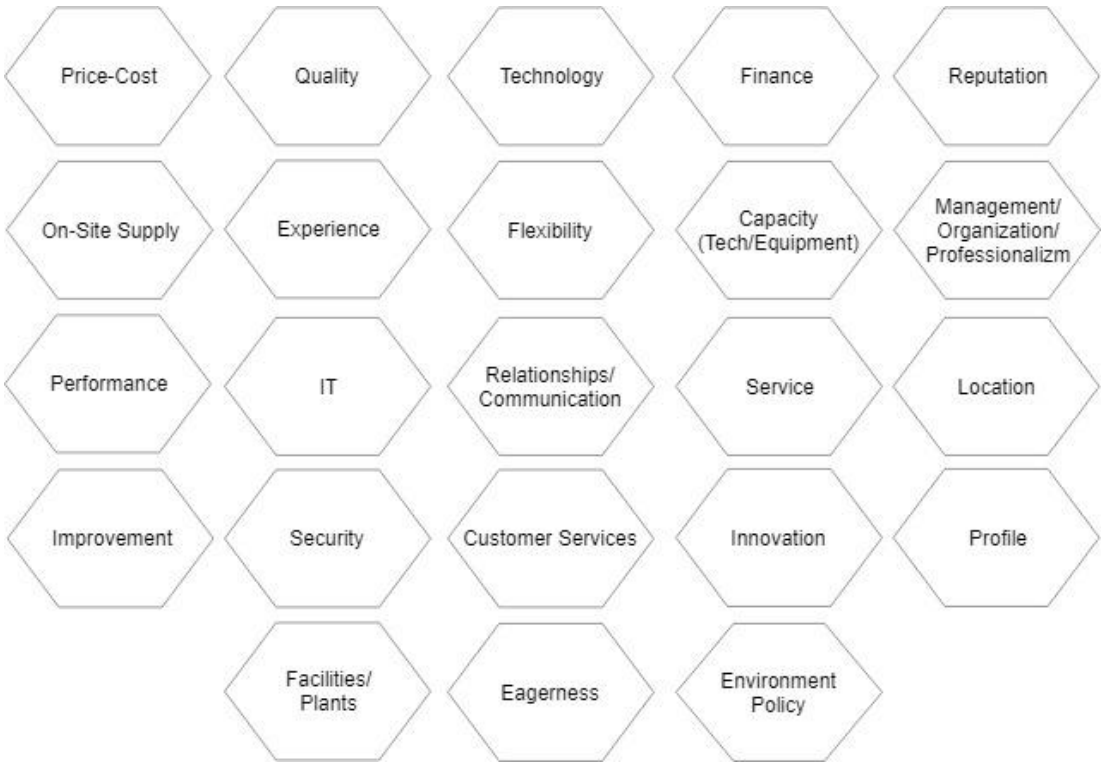

Fig. 6 General criteria model view

Table 8. Selected Criteria Explanations Based on Literature (1-15)

Selected Criteria (Yellows are the selected)	Relevance in Logistics	References
Price/Cost	It refers to the total cost of logistics outsourcing. Its related attributes include price, cost reduction, low cost distrbiution, expected leasing cost, operastion cost, warehousing cost and cost savings.	Aguezzoul, A., & Pires, S. (2016, April). 3PL performance evaluation and selection: a MCDM method. In *Supply Chain Forum: An International Journal* (Vol. 17, No. 2, pp. 87-94). Taylor & Francis.
Quality	Includes many aspects such as on-time delivery, accuracy, cost of loss and damage, promptness in attending customers' complaints etc.	Jharkharia, S., & Shankar, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. Omega, 35(3), 274-289.
Technology	Improves the overall performance of the suplly chain. Includes electronic data inetrchange, optimizatin, routing, RFID etc.	Gardas, B. B., D. Raut, R., & Narkhede, B. E. (2019). Analysing the 3PL service provider's evaluation criteria through a sustainable approach. International Journal of Productivity and Performance Management.
Finance	It is reflected in the firm's return on investment, return on assets, and value added services. Sound financial performance of the logistics service provider ensures that the services used in the logistics operations can be continiously upgraded.	Chen, W., Goh, M., & Zou, Y. (2018). Logistics provider selection for omni-channel environment with fuzzy axiomatic design and extended regret theory. *Applied Soft Computing* , *71* , 353-363.
Reputation	Refers to the opinion of the people about how good they are in satisfying the needs of customer.	Gürcan, Ö. F., Yazıcı, İ., Beyca, Ö. F., Arslan, Ç. Y., & Eldemir, F. (2016). Third party logistics (3PL) provider selection with AHP application. *Procedia-Social and Behavioral Sciences* , *235* , 226-234.
On-Site Supply	Risk of delayed-delivery due to issues like a complex network of the supply chain that postpone the timely delivery which leads to financial losses.	Alikhani, R., Torabi, S. A., & Altay, N. (2019). Strategic supplier selection under sustainability and risk criteria. International Journal of Production Economics, 208, 69-82.
Experience	It is a measurement of how experienced a 3PL provider is in the industries.	Hwang, B. N., Chen, T. T., & Lin, J. T. (2016). 3PL selection criteria in integrated circuit manufacturing industry in Taiwan. Supply Chain Management: An International Journal, 21(1), 103-124.
Flexibility	In operations and delivery may enable the user to give customized service to its customers.	Jharkharia, S., & Shankar, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. Omega, 35(3), 274-289.
Capacity (Tech/Equipment)	Capability of suppliers to adjust themselves toward innovations, adopt advanced process technologies and react to technological turbulence promptly.	Alikhani, R., Torabi, S. A., & Altay, N. (2019). Strategic supplier selection under sustainability and risk criteria. International Journal of Production Economics, 208, 69-82.
Management/Organization/ Professionalism	Able management of provider may not only provide good service but may also foster a long-term relationsheep between two parties.	Jharkharia, S., & Shankar, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. Omega, 35(3), 274-289.
Performance	Provision of periodic evalution of the performance of the provider enables the two parties to identify the gaps in service.	Jharkharia, S., & Shankar, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. Omega, 35(3), 274-289.
Technic Capacity (IT)	Advanced IT capabilities of a provider help in reducing uncertainties and inventory level. In some cases, the providers may allow the users to take advantage of their IT capabilities.	Çakır, E. (2009). Logistics outsourcing and selection of third party logistics service provider (3PL) via fuzzy AHP.
Relationships/Communicat on	Which include shared risks and rewards, ensure cooperation between the user and the provider.	Çakır, E. (2009). Logistics outsourcing and selection of third party logistics service provider (3PL) via fuzzy AHP.
Service	Quality management systems that the service provider exploits like ISO9000 give an idea about the service.	Göl, H., & Çatay, B. (2007). Third-party logistics provider selection: insights from a Turkish automotive company. Supply Chain Management: An International Journal, 12(6), 379-384.
Location	It is related to attributes such as distribution coverage, geographical localisation and coverage, international scope, market coverage, shipment destinations and distance.	Karrapan, C., Sishange, M., Swanepoel, E., & Kilbourn, P. J. (2017). Benchmarking criteria for evaluating third-party logistics providers in South Africa. *Journal of Transport and Supply Chain Management* , *11* (1), 1-10.

Table 9. Selected Criteria Explanations Based on Literature (16-31)

Selected Criteria (Yellows are the selected)	Relevance in Logistics	References
Improvement	Reputation for continious problem solving can be realized from the ideas taken from the references of 3PL provider.	Göl, H., & Çatay, B. (2007). Third-party logistics provider selection: insights from a Turkish automotive company. Supply Chain Management: An International Journal, 12(6), 379-384.
Security/ISG	Ensure the safety of the workforce and helps to balance the social dimension sustainability.	Gardas, B. B., D. Raut, R., & Narkhede, B. E. (2019). Analysing the 3PL service provider's evaluation criteria through a sustainable approach. International Journal of Productivity and Performance Management.
Customer Services	Sign for dedicated resources for the company.	Göl, H., & Çatay, B. (2007). Third-party logistics provider selection: insights from a Turkish automotive company. Supply Chain Management: An International Journal, 12(6), 379-384.
Innovation	Participation in production of new products, talent of problem solving in terms of technic issues, information and technology sharing.	GÜNAY, Z., & ÜNAL, Ö. F. (2016). AHP-TOPSIS yöntemi ile tedarikçi seçimi (Bir telekomünikasyon şirketi örneği). PESA Uluslararası Sosyal Araştırmalar Dergisi, 2(1), 37-53.
Profile of Company	Contingent risk with regard to supplier's past performance, financial status, manufacturing facilities and customer-oriented approach.	Alikhani, R., Torabi, S. A., & Altay, N. (2019). Strategic supplier selection under sustainability and risk criteria. International Journal of Production Economics, 208, 69-82.
Facilities/Plants	Location, Capacity, Shelf Systems, Good Carrier Systems, Operational Sufficiency.	Depolama Faaliyetleri için LSP Seçiminde Önemli Değerlendirme Kriterlerinin Belirlenmesi-2014-Uluslararası Yönetim İktisat ve İşletme Dergisi Cilt 10
Eagerness	To find the solution for customers's complaints or requests quickly. For to do the job.	Kerkhoff, E. (2018). Çok kriterli karar verme yöntemleriyle tedarikçi seçimi (Master's thesis, İstanbul Ticaret Üniversitesi).
Environment Policy	Standards and certifications like ISO14000, planning, performing of environmental activities.	Alikhani, R., Torabi, S. A., & Altay, N. (2019). Strategic supplier selection under sustainability and risk criteria. International Journal of Production Economics, 208, 69-82.
Operational Controls	Refers to the IT capabilities, and size and quality of fixed assets. Providers' capability of general management of operations.	Wang, J. J., Wang, M. M., Liu, F., & Chen, H. (2015). Multistakeholder strategic third-party logistics provider selection: a real case in China. Transportation Journal, 54(3), 312-338.
Waste Management	For sustainable practises recycling of products can contribute to green initiatives.	Gardas, B. B., D. Raut, R., & Narkhede, B. E. (2019). Analysing the 3PL service provider's evaluation criteria through a sustainable approach. International Journal of Productivity and Performance Management.
Risk-Risk Management	Capability of the provider to adress any unforeseen problem. Ensures the continuity of the services.	Jharkharia, S., & Shankar, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. Omega, 35(3), 274-289.
Certification	To ensure the legitimacy of services provided.	Wang, J. J., Wang, M. M., Liu, F., & Chen, H. (2015). Multistakeholder strategic third-party logistics provider selection: a real case in China. *Transportation Journal* , *54* (3), 312-338.
Workforce Relationships	Develops trusts, helps to improve compatibility, alliance, dependence and reliability.	Gardas, B. B., D. Raut, R., & Narkhede, B. E. (2019). Analysing the 3PL service provider's evaluation criteria through a sustainable approach. International Journal of Productivity and Performance Management.
Distance	Related to attributes such as distribution coverage, market coverage, shipment destinations etc.	Govindan, K., Agarwal, V., Darbari, J. D., & Jha, P. C. (2019). An integrated decision making model for the selection of sustainable forward and reverse logistic providers. Annals of Operations Research, 273(1-2), 607-650.
Guarantee/ Policies	Product safety during logistics operations.	Hwang, B. N., Chen, T. T., & Lin, J. T. (2016). 3PL selection criteria in integrated circuit manufacturing industry in Taiwan. Supply Chain Management: An International Journal, 21(1), 103-124.
Compliance with Procedures	Number of sertifications that a company owns in terms of credentials.	Govindan, K., Agarwal, V., Darbari, J. D., & Jha, P. C. (2019). An integrated decision making model for the selection of sustainable forward and reverse logistic providers. Annals of Operations Research, 273(1-2), 607-650.

We have conducted a general criteria review and general criteria model as shown in Figure 6. General criteria mean that these factors and criterions are looked upon by companies as must to do basic business in global industries; in other words, if a company does not have these terms it would be difficult to survive or be successful in logistics industries, even in the basic ones such as excavation wastes, etc.

The criteria are listed in terms of their scores from our grading study, from left to right. As can be seen, first one is “Price-Cost” criteria. Even though we mentioned that with the technological advancements in the global word companies seeking for more equipped LSPs in those terms, this consideration is always at the top of this list. Because, besides the criteria that we found the literature, outsourcing decision comes first due to cost considerations; in other words, companies started to consider the issue of outsourcing because they wish to reduce their expenditures in terms of logistics at first. We can add quality criterion into this consideration. To clarify that, when global companies are seeking for an LSP, while considering the price issue, they usually consider the quality criteria as well. Combining these two criteria, at the end, they try to reach the LSP which serves in “optimum” conditions in terms of price and quality.

Other criteria come with quality considerations; in other words, quality factor could be considered as a general factor that contains technology, on-time supply, flexibility etc. However, while in some resources a company is looking for especially on-time supply factor, another company is looking for flexibility factor. Because of this reason, this list contains 23 factors that could be denoted as general requirements of companies. There are also some factors that is growing in reputation rapidly nowadays such as customer services. Formerly companies’ sole consideration was themselves - such as reducing costs; however, in today’s world, the other side of this

business, relationships, add worth to factors such as customer services, relationships, communications, etc.

In fact, when we investigate today's LSPs, we see that factors demonstrated in our general factor model already takes place in many companies' contracts as basic services. Other LSPs that are unskilled about one or more services from the model try to bring in these services into their companies by increasing their investment budgets, as these services are necessity to maintain their businesses in the industry. Actually, one factor brings another one to the company; to put it in a different way, when a company tries to be flexible in terms of logistics activities this situation can be possible with technological advancements and capacity improvements. Thus to be capable of any request coming from client companies starts from one point and other ones are brought into company naturally.

4.2 Industry specific factor review and results

As stated in the previous section, general criteria model is the center of this thesis, and other remaining parts of the thesis and literature reviews are going to be shaped by that. As a result of this, in the next step of literature survey (specific factor review), we have conducted a review for the purpose of finding industry specific factors which are special to belonging to a certain industry in addition to the general criteria model.

In this step, except the guidelines of our steps in the general factor study, we tried to determine and investigate the criteria that are specific for each industry. Because to be able to get to the final phase with customers or increase the companies' chances to get the tender in contracting, there are some industry specific

critical factors which could be the vital for a company. Because of this reason, we have drilled down our research to the industries on an individual basis.

For this purpose, in literature we found 63 articles about industry based LSP selection and evaluation. These nearly cover all of our investigated industries. Furthermore, the criteria found in these studies added to related industries as illustrated in the Figure 7. However, in some industries we noticed that there is a lack of industry specific criteria such as paper and paper products industry; in other words, all of the criteria for these industries are already covered by our general criteria model.

A different example on the other end of the spectrum is the food and beverage industry where there are many crucial factors that play a vital role in their production and distribution cycles such as quality of cold storage and tracing systems. An LSP, in today's world, has to be capable of answering all such requests by clients. Consequently, together with general criteria, these specific industrial factors play a crucial role in 3PL/LSP selection processes in clients operating in the food and beverage industry. Final model that presents both general and industry specific criteria is illustrated in the Figure 7.

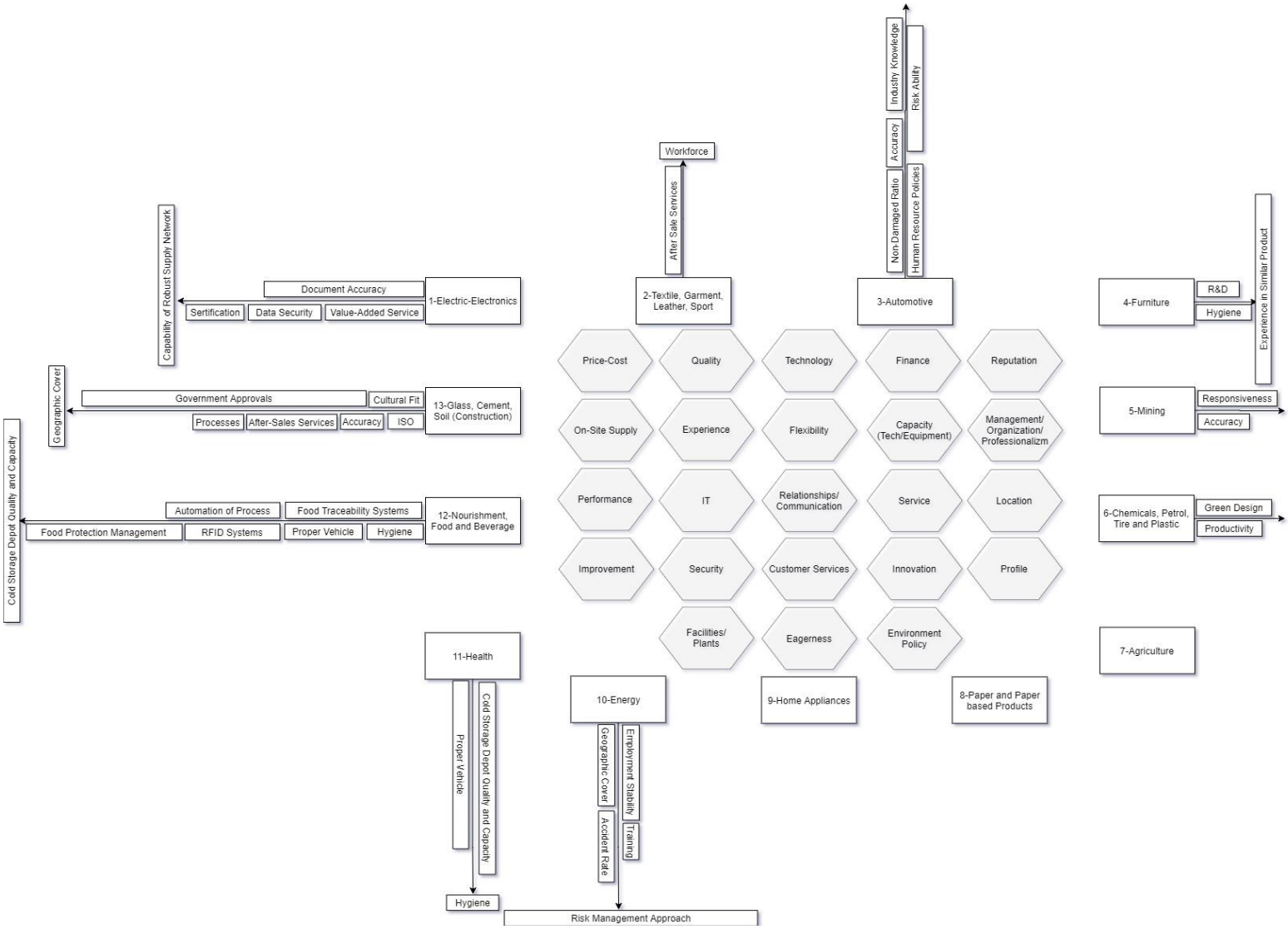

Fig. 7 Industry specific criteria model view

In industry specific criteria review, we found factors for nearly all industries included in this study except paper and paper-based products, home appliances and agriculture industries. For other industries, in the literature, several studies have been published. When industry specific criteria model has been examined, it can be seen that food and beverage, electric-electronic, automotive and construction industries have much more criteria than other industries. This situation may originate from complexity degrees in operational activities in these industries. The situation may also be due to these industries not being investigated as deeply as the food and beverage, electric-electronic, automotive and construction industries, because actually every industry has its own complexities in terms of operational or storing activities.

One could easily say that for production industries such as electric-electronics, automotive and construction, quality certifications and responsiveness sub-criteria is the most wanted criteria. From another point of view, some industries which have products that could easily be spoiled because of external conditions such as paper and paper-based products, furniture, food and beverage, and textile; these strictly pay attention to factors of hygiene and the suitability of transportation vehicles.

Moreover, industries such as healthcare, food and beverage whose products must be kept in the cold-storage rooms consider this issue as significant because of expiry date and health risk issues. Also, energy, mining, white appliances and automotive industries pay more attention to the criteria of rate of non-damaged transportation of logistics service providers. Energy industry has also paid attention to issue of employment stability and training. Other criteria such as geographic coverage has got attention from two industries, construction and energy industries.

Experience in similar products/industries and related industry knowledge are seen as important by automotive and furniture industries.

Furthermore, there exist some industry specific criteria that is only unique for related industry. One such example is filling rate of trucks in the furniture industry. This is because products like beds, cabinets have certain lengths and width, and while truck is been loaded, they should be placed very carefully in order to fill every space in the trailer for being more productive in transportation activities and reducing unit costs. Another example for this issue comes from green design criteria of chemicals/petrol/plastic industry. This factor corresponds to suitability to governmental laws of environmental policies and implications of the logistics service providers in terms of conditions according to material properties; likewise, in the food and beverage industry there is a factor of management of food security systems that corresponds to tracking life cycle of products from the beginning of production to the end of distribution through the clients via LSPs.

To sum up, these additional industry specific factors could have possibility to be valid for many industries or only for one industry as we mentioned in the above paragraph. According to our point of view, these are the keys of getting closer with the clients in terms of agreement and could be a chance to outshine other companies that do not have any knowledge about these industry specific conditions. In other words, when a manager combines general and specific criteria models taken from our study, gap of knowledge about the clients' industry would be much smaller and this increases the chance of the manager to be successful in the related industry even if the manager experiences a lack of knowledge in these industries' requirements. Additionally, models also have a possibility to being upgradeable in terms of the

managers' experiences in order to expand criteria extent of any industry to create more useful models according to their business and strategy views.

4.3 Client contracts review and results

In the next step, we had a chance to reach an archive that contains client's contracts for a long time period; with that archive, we had an opportunity to achieve convergence of this study with real implications. This is one of the two powerful aspects of this study – it incorporates not only academic studies' factors but also real businesses' factors to be able to be applicable in real business environments.

In most contracts, there is a page at the end where clients lay down their business conditions in order to create a secure business environment. These can be about distribution, warehousing, and harmony of worker with company working environment as illustrated in the Table 9. In every client contract scope, there are certain topic titles such as liabilities, duties, performance review, invoice issues, insurances, guarantees, period, confidentiality, rescission, results of rescission, policies of quotations and operational conditions at the end. In scope of this study, our main focus is on operational conditions to be able to reflect real business circumstances. In every contract that was found in the company archive, we have investigated this part and will present them in the following parts.

Table 10. Example of Client Contract Review

F	Automotive	Proper and Controlled Vehicles
G	Mining	Proper Vehicles with Transportation Legislations
H	Paper Products	Hygiene, Cleanliness, Awning

A logistics service provider has to be compatible with these conditions. In the case of not having these features, company has to make an investment to be capable of carry out these terms as these there are the fundamentals of their running

operations which an LSP has to collaborate with client in order to maintain long relationships with them.

From another point of our view to conduct such a work is provide real industry factors together with our general and specific factor models. Because these criteria have been founded from real client contracts that contains too much true to life information about our theme of thesis. For managers, this kind of specific and nearly impossible information to find are has a price at a premium maybe more; here with, they will have the opportunity at business meeting in order to catch them from their building stones and draws attention to climb up the success steps in the market.

In order to achieve the goal of this section of review, we investigated the archives regardless of the years of the contract was signed and found 41 contracts which contain noteworthy industrial specific criteria in their operational specification pages. In the Table 10, client's industries and their operational considerations are shown. Furthermore, Table 11 lists the contracts distribution and Table 12 list the years of these contacts. Moreover, in Table 13, findings from client contracts are shown.

Table 11. Industries and Special Conditions Distribution

Row Labels	Vehicles	Hygiene-Cleanliness-Dryness	Labor	Occupational Health and Safety	Special Condition	Special Condition
AGRICULTURE	1	1				
AUTOMOTIVE	2		1			
CHEMICAL	1	1	1		3	1
CONSTRUCTION	1					
ELECTRIC	1			1		
FOOD AND BEVERAGE	7	3	4	2	7	3
FURNITURE					1	2
MINING	2			1		
PAPER PRODUCTS	2	2		1	1	
PETROL AND ENERGY	3	2	3	1	1	
PLASTIC						1
SPORT						
TEXTILE	1					1

Table 12. Distribution of Contracts in terms of Industry

No	SECTOR	TOTAL
1	Agriculture	1
2	Automotive	2
3	Chemicals	4
4	Construction	1
5	Consumer Goods	1
6	Electric-Electronic	1
7	Energy	3
8	Food and Agriculture	1
9	Food and Beverage	16
10	Furniture	2
11	Mining	2
12	Paper Products	4
13	Petrol	2
14	Plastic	1
15	Sport	1
16	Textile	1

Table 13. Distribution of Contracts in terms of Years

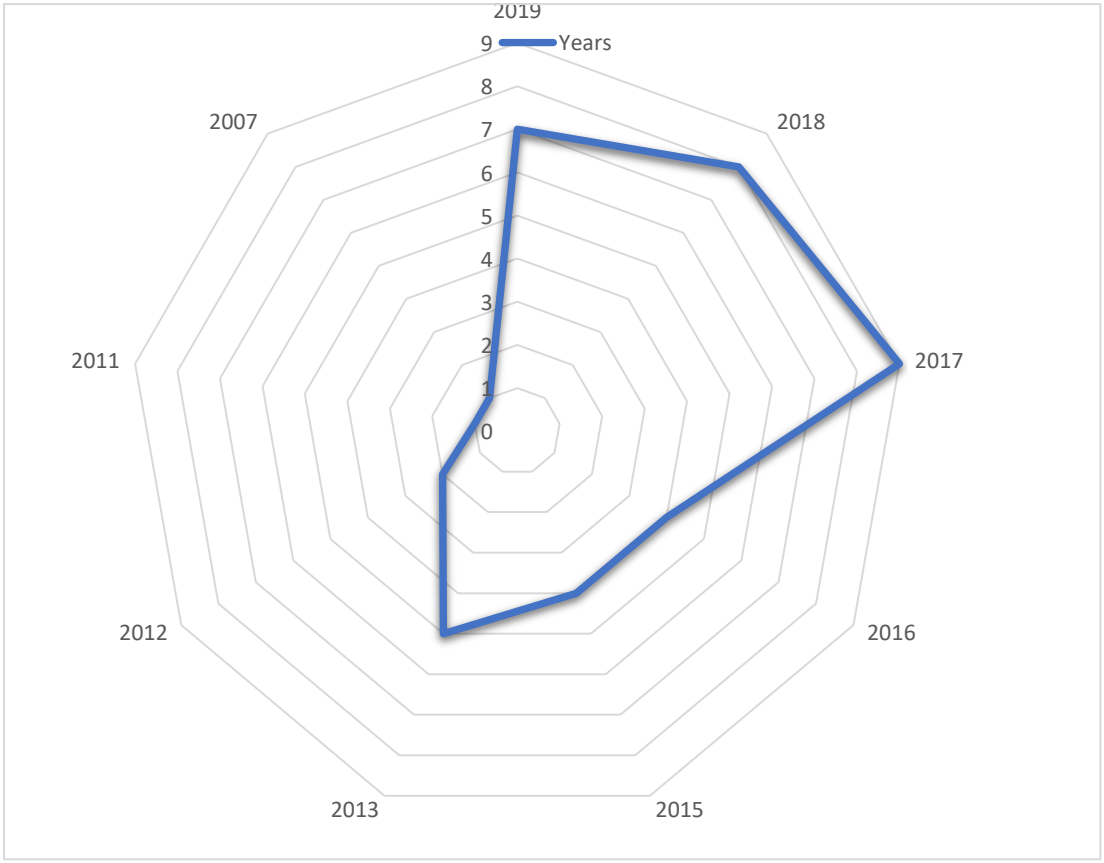

Table 14. Findings from Clients' Contracts

SECTOR	1-Vehicles	2-Hygiene-Cleanliness-Dryness	3-Labor	4-Occupational Health and Safety	5-Special Condition	6-Special Condition
FOOD AND BEVERAGE	Proper Vehicles with Food Codex					
FOOD AND BEVERAGE	Proper Vehicles with Food Codex, Awning				Performance Tracking Reports	Documents of Competencies
FOOD AND BEVERAGE				Occupational Health and Safety	Customs Affairs	
PAPER PRODUCTS	Proper Vehicles, Awning	Hygiene-Cleanliness-Dryness				
PLASTIC						Confidentiality
AUTOMOTIVE	Proper Vehicles					
MINING	Proper Vehicles with Legislations					
PAPER PRODUCTS	Awning	Hygiene-Cleanliness-Dryness				
FURNITURE					Environmental Legislations	
SPORT						
FOOD AND BEVERAGE					Temperature-Moisture	
CHEMICAL					Management and Organization	
PETROL AND ENERGY	Proper Vehicles	Hygiene-Cleanliness-Dryness	Labor Structure and Training			
PAPER PRODUCTS				Occupational Health and Safety		
FOOD AND BEVERAGE		Hygiene-Cleanliness-Dryness			Temperature, Moisture	
FOOD AND BEVERAGE		Hygiene-Cleanliness-Dryness			Risk Management	
PETROL AND ENERGY	Proper Vehicles with Legislations				Waste Trasportation Legislations	
FOOD AND BEVERAGE	Car Tracking Systems					
MINING	Box Trucks			Occupational Health and Safety		
ELECTRIC	Box Trucks			Occupational Health and Safety		
CHEMICAL	Proper Vehicles	Hygiene-Cleanliness-Dryness			Certificates	Personnel and Drivers Training
AUTOMOTIVE	Proper Vehicles		Labor Structure and Training			
FOOD AND BEVERAGE					Compatible with Firm's Vehicle Standards	
CHEMICAL			Labor Structure and Training			
PETROL AND ENERGY	Proper Vehicles			Occupational Health and Safety		
FOOD AND BEVERAGE	Proper Vehicles with Food Codex		Labor Structure and Training			
PETROL AND ENERGY			Labor Structure and Training			
AGRICULTURE	Refrigerating Polyester Truck Haulage	Hygiene-Cleanliness-Dryness				
FOOD AND BEVERAGE		Hygiene-Cleanliness-Dryness				
PETROL AND ENERGY		Hygiene-Cleanliness-Dryness	Labor Structure and Training			
TEXTILE	Reinforced Vehicles					ISO9001
FURNITURE						IT
FURNITURE						Documents of Competencies
FOOD AND BEVERAGE	Proper Vehicles with Food Codex		Labor Structure and Training			
CHEMICAL					Hazardous Material Legislations	
FOOD AND BEVERAGE			Personel Qualifications of Forklifts			
FOOD AND BEVERAGE	Degree Adjustable Vehicles					
PAPER PRODUCTS					Environmental Legislations	
FOOD AND BEVERAGE				Occupational Health and Safety		Environmental Responsibilities
FOOD AND BEVERAGE	Proper Vehicles		Labor Structure and Training			
CONSTRUCTION	Watertigt Vehicles					
FOOD AND BEVERAGE					Technology	Harmony with Standard

In the customers contracts review conducted, we tried to determine real and documented factors which includes operational conditions of firms in terms of their business activities' requirements in addition to academic criteria. These criteria are placed at the end of contracts in operational conditions page/s, and the content of this document is prepared by a special group including doyens of their businesses in the field of warehousing and distribution.

When we analyze the data gathered from contracts, there are five categories basically categorized as vehicles, cleanliness, labor, occupational health and safety, and other special criteria. In the first group, vehicle, the main point is suitability of vehicles to operations named as proper vehicle in the contracts. Moreover, there are some special requests in this group such as in the construction industry criterion of watertight transportation. In the food and beverage industries, this criterion comes with the suitability of trucks to food codex. Additionally, in mining and electric-electronic industry, box trucks criterion has come up as we can see from the Table 13. Other factor which is emphasized in the contracts is "awning" term founded in paper products and food-beverage industries.

In the second group of criteria, hygiene-cleanliness-dryness criterion, we can easily say that this criterion is highly important for many industries, thus we separated this criterion from vehicle group to emphasize it. This is important for five industries in our table; paper products, petrol and energy, food and beverage, and agriculture industries. In the third group, there is labor criteria which is found to be important for four industries; automotive, chemical, petrol and energy, and food-beverage. In this group, there is one specific criterion related to labor issue as shown with qualifications of forklift drivers in food and beverage industries.

Fourth group contains industries which have paid attention to issue of occupational health and safety; food and beverage, paper products, mining, electric-electronic, and petrol and energy industries. There are two more groups which contain unpairable criteria within industries; in other words, these ones are special to the related industry rather than other criteria. For example, food and beverage industries have many of them such as risk management, control of temperature and moisture of the warehouse, and performance tracking reports. Another example is furniture industry with the criteria of information technologies and documents of competencies.

To conclude, client contracts were helpful in expanding the extent of our study in terms of criteria since most of them contain specific criteria which we cannot have found from the literature. Furthermore, we can easily state that we have update our model with six groups of criteria for the purpose of trying to fill every gap in industry specific conditions with contracts.

4.4 Interviews

In addition to the findings that were extracted from literature review and client contracts, we also conducted interviews with high level managers and directors who have more than 10 years' experience in the logistics industries. The general and specific factor models are based upon literature and real industry true-life experiences, thus they have strong convergence to reality. On top of this, our client contract review has also contributed to real, recorded industry specific conditions. However, still, there is further room for improvement in the model by contributions of professional employees who manage distribution and warehousing

While conducting interviews and process of approval, we asked them four main questions:

- Do you approve the general criteria which have been found from the literature?
- Do you have any general criteria that you want to add this model?
- Do you approve the specific criteria for each industry which have been found from the literature?
- What specific criteria do you want to add to model from your experience with clients?

As mentioned, for the purpose of accommodating real-life cases and especially reality in terms of criteria, interviews are made with one Research and Development director, one Distribution director, one Warehouse manager, and one Distribution center manager from a private logistics services provider company. According to their answers, general criteria table is revised, and criteria models are updated as we will demonstrate in the following discussion. Every approval of criteria shown in the final model with an asterisk (*). If there is a triple asterisk (***), this means that three of four senior officials have approved the given criteria. Moreover, in the final model, turquoise colored factors refer to criteria added by managers and directors. Results of the interviews and example from approval display are shown in the Table 14 and Figure 8.

Table 15. Approvals from Interviews about General Criteria Model

		Approvals			
C.No.	Selected Criteria	1 (Warehouse Manager)	2 (R&D Director)	3 (Logistics Center Manager)	4 (Distribution Director)
1	Price/Cost	√	√	√	√
2	Quality	√	√	√	√
3	Technology	√	√	√	√
4	Finance	√	√	√	√
5	Reputation	√	√	√	√
6	On-Site Supply	√	√	√	√
7	Experience	√	√	√	√
8	Flexibility	√	√	√	√
9	Capacity (Tech/Equipment)	√	√	√	√
10	Management/Organization/Professionalism	√	√	√	√
11	Performance			√	√
12	Technic Capacity (IT)	√		√	√
13	Relationships/Communicaton	√	√	√	√
14	Service				√
15	Location	√	√	√	
16	Improvement	√	√	√	√
17	Security/ISG	√	√	√	√
18	Customer Services	√		√	√
19	Innovation	√	√	√	
20	Profile of Company	√		√	√
21	Facilities/Plants	√	√	√	
22	Eagerness	√	√	√	√
23	Environment Policy	√	√	√	√

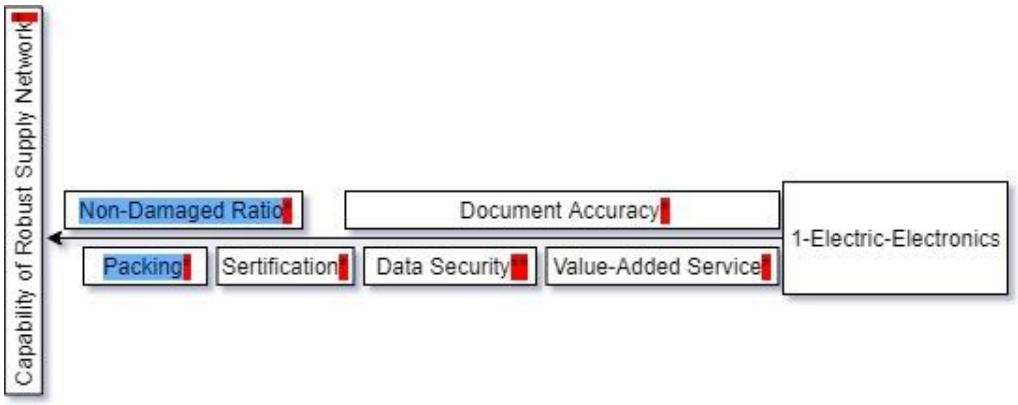

Fig. 8 Example of approvals and additions from interviews

In performed interviews, our purpose is discussing the criteria and models with executives and provide support for the model by their experiences from the business life. While conducting interviews, at the beginning we explained our aim of why we

carried out this study; after that, we started to ask our questions as listed. During interviews we recorded the conservations for the purpose of entering in the register.

First of all, we conducted an interview with a warehouse manager from a logistics service provider company. This person has been an employee of this company for more than five years and carried out businesses with more than 20 clients in her work-life. The interview lasted 25 minutes. During her career she has worked with clients from electric-electronic, construction, food and beverage, paper and paper-based products, automotive and furniture industries. At the end of the conservation about general criteria model, she has approved most of the criteria; however, she mentioned that performance criterion should be associated with on-site supply criterion, and services criterion should be associated with quality criterion because of the similarities between them. This is why these criteria are left blank in the Table 14. From our point of view, we have identified them separately because their identification in the literature are different from each other; however, further studies could be combining them for the purpose of decrease the number of criteria.

In the second part of conversation, about industry specific criteria model, she has approved some criteria according to her experiences from industries which she has experience in. Moreover, she has included some additional criteria into our model which will be indicated with turquoise color in the final model; non-damaged transportation ratio in paper and paper products industry, and packaging quality in furniture industry.

In the second interview which lasted 40 minutes, we met with research and development director of a logistics service provider company who has been an employee of this company for more than one year and has businesses experiences with many customers from many industries in his work. This professional has

experience with customers from healthcare, paper and paper products, agriculture, chemicals, textile and furniture industries and he has also working experience in some of these industries. When he finished the reviewing of our general criteria model; he made some comments similar with the first interview. Performance criterion with on-site supply criterion, IT criterion with technical criterion, service criterion with quality criterion, and customer services criterion with relationships criterion should be associated together. Moreover, he considered that profile criterion could be comprised of some other criteria according to general criteria model such as reputation, quality, finance, experience etc. However, in the literature, every criterion has its own definitions; because of this situation, we included them separately in our model. Additionally, he stated that criterion of innovation could be named as innovation on technology.

In the second part of conversation, about industry specific criteria model, he has approved some criteria according to his experiences from industries which has experience in. Furthermore, he has added some criteria to our model which will be demonstrated in the final model with turquoise color; traceability of goods in textile, health and automotive industry, trustworthiness to employee of LSPs in automotive industry, occupancy rate of trucks in furniture industry, waste management in chemical industry, hygiene and air-conditioning in agriculture industry, and accreditation,/certification and proper vehicles in healthcare industry.

Third we conducted an interview of 20 minutes with logistics center manager of a logistics service provider company who is employee of this company for more than eight years and have businesses experiences with many customers from many industries. He has experience with clients from electric-electronic, food and beverage, paper-based products, chemicals and furniture industries. In general

criteria model, he has approved all of the criteria except service criterion like the previous managers. He stated that service criterion should be associated with quality criterion.

In the second part of the interview, he has approved and added some additional criteria to our model. These will be shown in the final model too with turquoise color; packaging and non-damaged transportation ratio in electric-electronic industry, waterproof trucks and proper vehicles/trailers in paper-based products industry.

In the fourth and final interview, we met with distribution and fleet director of a logistics service provider company who has been employee of this company for more than 14 years. He has businesses experience with customers from many industries such as construction, food and beverage, health, energy, chemicals, paper-based products, mining, automotive, and furniture during his career; the interview lasted 45 minutes. In the general criteria model, he approved nearly all of the criteria except location, innovation, and facilities plants. He stated that location criterion has no importance at all for distribution activities other than warehousing; because, in distribution business an LSP must go anyplace where customers are found. For innovation factor, his opinion is this criterion should be associated with improvement criterion. Moreover, in arguing environment policy criterion, he stated that in their company they tried to purchase trucks with euro 6 standards in terms of reducing carbon emissions; additionally, their field team is always making measurements for the purpose of controlling the carbon emission rate of the fleet.

According to his opinion, security is an up and coming criterion which is gaining reputation swiftly, and it is important for many issues such as customers' views towards LSPs, and judicial processes of the LSPs. Furthermore, he stated that

flexibility criterion is very important in this list in terms of responsiveness and sufficiency to the all requests of customers. For profile criterion, he said that this criterion is an indicator of a company's style of doing business, mission and vision. Moreover, he has found no relationship with facilities plants criterion contribution to the distribution activities. He also emphasized that eagerness is the most important criteria for an LSP in this list.

In the second part of the interview, about industry specific criteria model, the director approved and further added certain criteria into our model which will be shown in the final model again in turquoise; non-damaged transportation rate in construction and food and beverage industries, filling rates of trucks in paper and paper based products and mining industries, SHE-Q in chemicals and energy industries, coherence with legal necessities in food and beverage and healthcare industries, certifications of trucks in energy and chemicals industries, security of employees in chemicals industry, optimum transportation model in mining industry, and compatible working schedules with annual plan in automotive industry. Also, he stated that in food and beverage industry there is no need for proper truck criterion, and human resources policies and industry knowledge criteria in automotive industries are unnecessary. Moreover, in paper and paper-based products industry, it could be an advantage if trucks have three meters height and are hypaethral. From his point of view, in furniture industry, packaging techniques is the most important criteria. At the end of his reviews, he also made a final statement about criteria: "Hygiene, operational health and safety, maximum filling rates of trucks, research and development projects, technological infrastructure, traceability, and non-damaged transportation rates are the routine expectations of customers and all LSPs must have these".

4.5 Final model

Outcome of this study is the final model is shown in the Figure 8 which includes general criteria review, industry specific criteria review and outputs of interviews. In the figure, general criteria are shown in the middle of the framework with hexagonal shapes. Moreover, each industry has its own industry specific criteria which are lined up around each arrow illustrated with rectangles.

In the figure, there are a number of criteria colored in turquoise which comes from conducted interviews; in other words, these are the criteria that added by executives during interviews. In the interviews, first, executives were questioned with approvals of general criteria in the model. These approvals are shown in the Figure 9 with red color. After that, there was a step of approval of industry specific criteria according to our model. These approvals by executives are shown with (*) and colored with red color in the final model, and as number of approvals are increased the number of (*) is increased.

Fig. 9 Example for general and approved specific criteria

According to literature reviews, we tried to create comprehensive framework for managers of logistics service providers as illustrated in Figure 10. There are 13 chosen industries for this study and according to reviews most of them gained attention from authors in the literature which are helping studies to industry specific criteria model. However, as can be seen from the final model, there are three

industries that have no industry specific criteria according to literature review: white (home) appliances, agriculture and paper-based products. Nevertheless, according to interviews, we had a chance to find criteria related to these industries except white (home) appliances. For that industry, neither literature review nor interviews have no contribution in terms of criteria.

Due to the conducted interviews, there are some important criteria for executives that are not included in works found from literature such as non-damaged transportation ratio, packaging, transportation fulfillment rate, traceability of goods and compliance with legal obligations. These are the most common additional criteria in final model by executives. Moreover, they stated that these criteria are the most important criteria for clients during selection processes of LSPs. In additional criteria, there are few specific criteria which is unique for related industry such as water tightness in paper-based product industry, climatization in agriculture industry, waste management in chemicals and petrol industry, and coordinated works with annual plans in automotive industry. In this regard, executives stated that these criteria are the key factors of being successful in related industries.

When approval number is considered in reference to final model, it could easily be stated that hygiene, transportation fulfillment rate, certifications of transportation vehicles, traceability of trucks, and experience have led the list. In the model, nearly all of the criteria including general and specific models have approvals according to interviews; however, there are some criteria that have not had any approval from the executives such as geographic cover and after sale services in construction and energy industries, responsiveness in mining industry, and human resources policies in automotive industry.

As could be inferred from the final model, construction and food-beverage industries have got nine industry specific criteria, this situation makes them first actors in the works related to topic of this study. Following these industries, the list is shaped as follows: electric-electronics, health, energy, automotive, chemicals and petrol, paper-based products, furniture, mining, textile and white (home) appliances. According to the final model, agriculture, paper-based products and white appliances industries have got no attention from authors in literature.

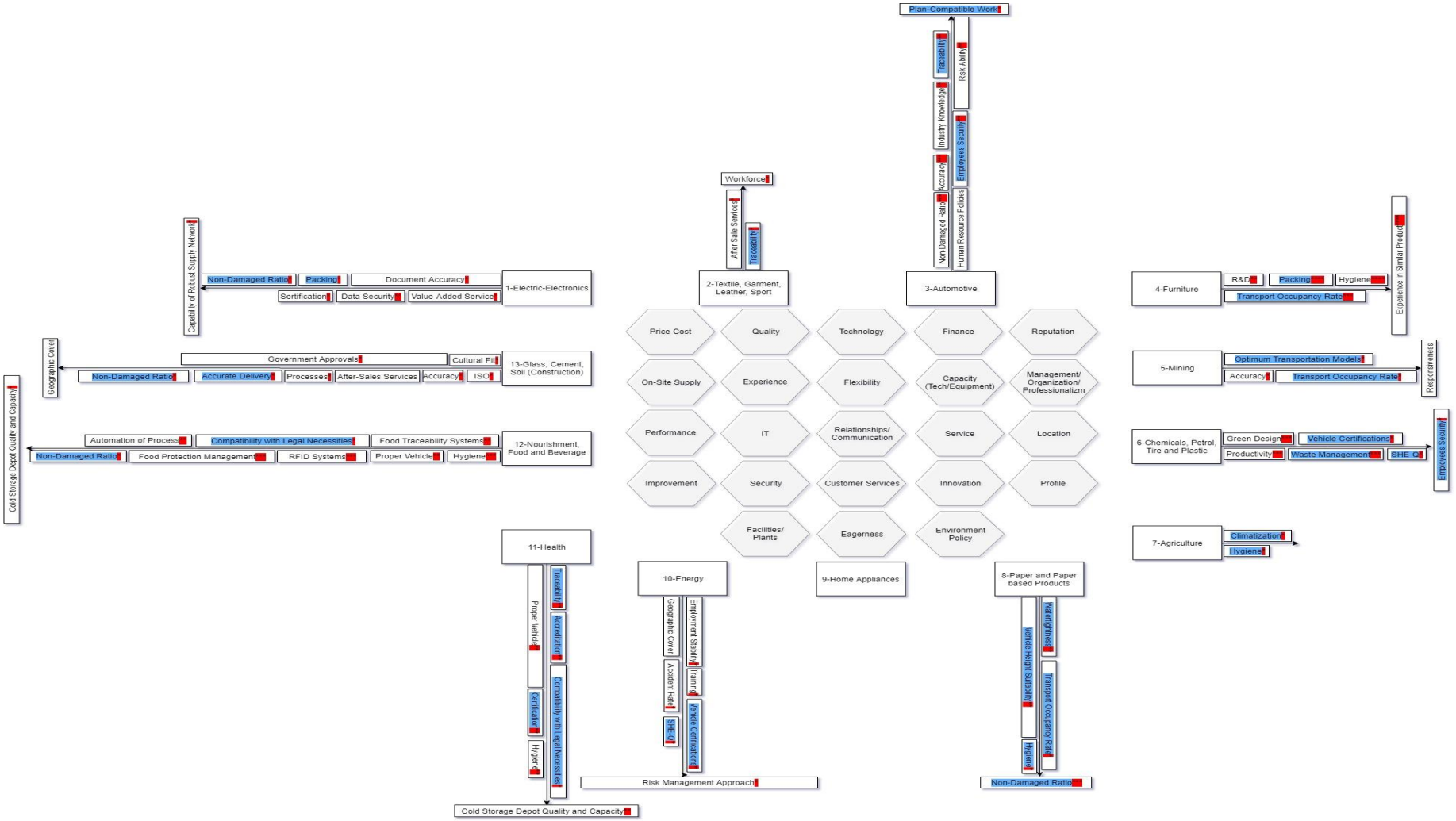

Fig. 10 Final illustration of the study models

CHAPTER 5

CONCLUSION

Logistics service provider selection processes is an important decision which potentially effects companies' performance. Outsourcing strategy should reflect the supply chain strategy, which in turn is a reflection of the overall competitive strategy of an organization. As is it essential that all functional strategies must support one another as well as corporate competitive strategy, it is imperative that this selection process involves qualitative and quantitative criteria to evaluate the candidates. From the literature review conducted for the purpose of identifying the criteria involved in this decision, we have recognized that in the selection processes, companies currently are using models and frameworks consisting of mathematical and statistical technicalities. Considering that companies have difficulties in the selection period, and making the right decision imposes burden upon managers, studies related to this issue have been gaining importance rapidly in literature.

In more detail, with recent technological progress and global advancements around the world, competitive advantage has become a primary concern of companies; in this sense, outsourcing decision has come to light. Selection of the most appropriate logistics service provider has become more complicated; because, companies is no longer working with one LSP, they are trying to find suitable provider for each activity (Gürcan, Yazıcı, Beyca, Arslan & Eldemir, 2016). Long-term relationship between customer and logistics service provider is seen as a source of competitive advantage in the global world; for this reason, selection process of LSP possesses a crucial role. Besides, focusing on core businesses is seen as another

source of competitive advantage by companies, this is another reason for outsourcing logistics activities to LSPs.

In this sense, companies have more comprehensive evaluation processes in the process of selection LSPs. Because of their outnumbered expectations from an LSP, they have started to investigate LSPs in more detailed way. An LSP has to be able to respond to all these expectations to become a successful LSP in industries. Thus, being successful in logistics industry has become a more sophisticated issue in today's world.

In this study, knowledge of logistics service providers about industry requirements and expectations for each industry issue is under consideration. We tried to present important and valuable knowledge for the managers so that they can better understand the industrial expectation that they would be faced with in the business world; briefly, our purpose is to help and improve LSPs' capabilities in local and global scale (Liu & Wang, 2009).

Being a comprehensive study is the major contribution of this study that unifies diversified issues for entrance of LSPs to the global industries. Also, study summarizes the selection process of a provider with reviewing related issues. Our approach is also helpful for decision-makers of LSP service customers in order to make accurate decisions and enabling them to visualize the impact of various criteria in the final result of their LSP selection. On the other hand, our findings help LSP managers who are trying to enter global industries to be a better logistics service provider for their customers. In summary, both parties could use this study for themselves to be more competitive or successful. Furthermore, since outsourcing concept is in high demand, our study provides an insight into various perspectives of

logistics outsourcing. Likewise, our methodology serves as a guideline to executives of logistics service providers in trying to gain customers from global industries.

Another major contribution of this study is focusing on operational issues under favor of interviews and client contracts along with academic research. Our study is expansive with the inclusion of operational conditions and extension of conversations with interviewees. According to our perspective, this is one of the important contributions of this study, setting it apart from other similar works in the literature.

23 most common criteria for the selection of LSPs and prerequisite qualifications that an LSP must have are determined by examining the literature in order to create a general criteria model. After general criteria model was created, numerous industry specific criteria have been identified from the literature. These criteria comprise of companies' requests and expectations from the LSPs for a specific industry. Moreover, an archive which contains customer logistics contracts were investigated for the purpose of finding the written industry specific criteria. In the final phase, interviews are made with managers and directors of a logistics service provider for the purpose of gathering approvals for criteria and determining additional criteria for the industries covered.

Our aim is to provide a basis for logistics service providers about how an LSP can become successful option for customers meeting customer expectations and improving its businesses activities in order to increase their dependability in the industry. From our point of view, with this model and information an LSP should be able to concentrate on developing their capabilities and involve in quality improvement processes to be more competitive. Furthermore, this study could be

upgraded by managers and researchers. When new criteria come up or new industries are added, they could be added to the model and upgraded for further studies.

The present study raises several issues which could be investigated further. For example, in the literature, for some industries there has been a lack of information in terms of criteria that we have noticed such as home appliances, agriculture, paper and paper-based products and mining. A researcher could ask why home appliances are not in the context of outsourcing. From another point of view, further research could study whether these criteria are valid only in Turkey or do they have an applicability worldwide. Although we have used international sources to identify criteria for the model, these may not be encompassing.

In the literature, some industries have gained too much additional industry criteria rather than others in literature as can be seen from the Figure 9. This situation could be addressed in further researches by authors. However, in this thesis, we tried to fill these gaps or deficiencies by interviews conducted with experienced high titled managers and directors.

Our findings are indicating similarities with resources which are included in this study. For example, in his study, Aguezzoul (2014) determined criteria have similarities with our findings in general criteria model such as cost, relationships, services, quality, IT capacity, flexibility, on-time delivery, professionalism, finance, location, and reputation. Another example is the work of Govindan, Khodaverdi & Vafadarnikjoo (2016); their findings are identical with ours in terms of general criteria such as finance, on-time delivery, performance, IT capacity, location, quality, performance, cost, and flexibility. According to Alkhatib, Darlington & Nguyen (2015), their 13 criteria are same with our general criteria. Moreover, 10 of 15 determined criteria in Çakın & Özdemir (2013) study also takes place in our general

criteria model. In Şahin & Berberoğlu (2011) work, our 13 of 23 criteria are similar with each other.

There are some limitations to this study. Additional criteria and comments on final model provided by interviewees of the logistics company create a possibility of bias. Bias of the executives towards any provider or customer cannot be leaved out while arguing our model. Another limitation about interviews is time. In all interviews, executives are very busy to answer questions in detail. They had to be contacted many times to arrange suitable day for the interview. For example, warehousing director, in despite of we have conducted with him many times, he did not give an answer for the day of interview. On the other hand, final model could be discussed with clients in order to increase applicability of model in further studies.

Moreover, in our general criteria review results, there are some criteria that are provided by LSPs which present premium services to their clients such as technology, improvement, and quality etc. However, price/cost criterion is also in the model. According to our point of view, price/cost criterion is irrelevant with these criteria; because, these kinds of services requires a vision more than just focusing on price/cost. Thus, as a suggestion for further studies, ignoring the price/cost criteria and focusing on the others could be an option.

Another limitation is about contracts. Only one Turkish company's contracts have been investigated, and these contracts includes only Turkish companies. This situation restricts the applicability of multi-criteria model in worldwide. In further studies, client contract review could be widened with investigation of foreign companies.

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