

**DOKUZ EYLÜL UNIVERSITY**  
**GRADUATE SCHOOL OF SOCIAL SCIENCES**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**  
**BUSINESS ADMINISTRATION DOCTORAL PROGRAM**  
**DOCTORAL THESIS**  
**Doctor of Philosophy (PhD)**

**PRIORITIZATION OF INDUSTRIAL SERVICE  
DIMENSIONS IN LOGISTICS CENTERS: AN  
INDUSTRIAL MARKETING APPROACH**

**Ceren ALTUNTAŞ**

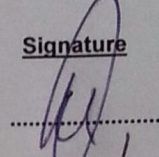
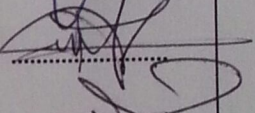
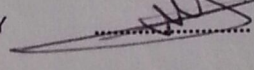
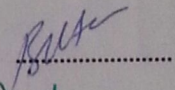
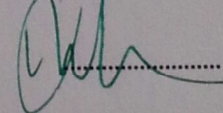
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**DOCTORAL THESIS**  
**TAPPROVAL PAGE**

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## DECLARATION

I hereby declare that this doctoral thesis titled as “Prioritization of Industrial Service Dimensions in Logistics Centers: An Industrial Marketing Approach” has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honour.

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Ceren

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**ABSTRACT**  
**Doctoral Thesis**  
**Doctor of Philosophy (PhD)**  
**Prioritization of Industrial Service Dimensions in Logistics Centers: An**  
**Industrial Marketing Approach**  
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Either to utilize common infrastructure and economies of scale opportunities or to develop new business and innovate through synergy, logistics clustering has started to attract significant attention at a global scale. Logistics centers are a form of logistics clustering where intermodal transportation activities are combined with value-added logistics services. They serve as a “one-stop-shopping” point to the industrial customers that seek various logistics solutions. following the successful examples in the world, developing countries have started to develop such facilities in order to align their infrastructure in accordance with the demands of global supply chains.

Within the light of these developments, this study adopts an industrial marketing perspective towards the logistics center concept and suggests propositions for logistics centers with reference to certain marketing theories. the study aims to build a framework for the industrial service design criteria at logistics centers, explore the industrial customer expectations from such facilities and the service characteristics that enable these expectations, explain the organizational buying determinants from logistics centers and prioritize the service characteristics according to the importance attained to specific customer expectations. These research questions are tried to be answered through triangulated research methodology that combines qualitative methods like focus group analysis, content analysis, interviews with quantitative methods like

exploratory factor analysis, regression analysis and quality function deployment (qfd). The research setting is chosen as turkey and the research sample is chosen as logistics service providers (LSPs) operating in Turkey.

The results of the study has implications for both scholars and practitioners. Turkey is in need of significant logistics infrastructure development in order to meet 2023 targets for foreign trade. Logistics centers are important elements of the infrastructure that supports transformation and movement of freight. taking a customer-oriented point of view and exploring customer expectations will provide useful inputs to policy makers and undertakers of such facilities and prevent them to invest in idle facilities. in addition to these practical implications, combination of marketing theories with logistics centers lead new streams of research for logistics clustering and transport geography. The study tries to present these implications to all related parties and makes an attempt to fill a research void in the current logistics centers literature.

**Keywords:** Cluster theory, Industrial marketing, Industrial services, Industrial network approach, Logistics centers, Organizational buying, Quality function deployment, Relationship marketing theory, Service-dominant logic, Triangulation

## **ÖZET**

### **Doktora Tezi**

**Lojistik Merkezlerde Endüstriyel Hizmet Boyutlarının Önceliklendirilmesi:**

**Endüstriyel Pazarlama Yaklaşımı**

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**İngilizce İşletme Anabilim Dalı**

**İngilizce İşletme Doktora Programı**

Lojistik kümelenme, gerek ortak altyapıdan ve ölçek ekonomisi fırsatlarından faydalanma amacıyla, gerekse de küme içindeki sinerji aracılığı ile yeni iş geliştirme ve inovasyon olanaklarıyla küresel ölçekte dikkat çekmektedir. İntermodal taşımacılık faaliyetlerinin katma değerli lojistik hizmetleriyle birleştiği lojistik merkezler ise lojistik kümelenmelere önemli birer örnek teşkil etmektedir. Bu tesisler, çeşitli lojistik çözümler arayan endüstriyel müşterilere “tek noktadan alışveriş” olanağı sunmaktadır. Dünyadaki başarılı örnekleri takiben, gelişmekte olan ülkeler de, altyapılarını küresel tedarik zincirlerinin taleplerini karşılayacak duruma getirmek amacıyla, benzer yatırımlar geliştirmeye başlamıştır.

Konu gelişmeler ışığında, bu çalışma lojistik merkez kavramına endüstriyel pazarlama bakış açısıyla yaklaşmakta ve farklı pazarlama teorilerinden yola çıkarak lojistik merkezlere yönelik önermeler geliştirmektedir. Çalışmanın amaçları lojistik merkezlerin endüstriyel hizmet tasarım kriterlerine yönelik bir çerçeve geliştirmek, potansiyel müşterilerin bu merkezlerden beklentilerini ve bu beklentileri karşılayacak hizmet özelliklerini keşfetmek, lojistik merkezlerden yapılacak örgütsel satınalma faktörlerini açıklamak ve farklı hizmet özelliklerini, müşteri beklentilerine atanan önem derecelerine göre önceliklendirmektir. Bu araştırma soruları araştırma yöntemlerinde çeşitleme yaklaşımı ile yanıtlanmaya çalışılmış ve odak grup analizi, içerik analizi, bire bir görüşme gibi nitel yöntemler, keşifsel faktör

analizi, regresyon analizi, kalite fonksiyon göçerimi gibi nicel yöntemler ile birlikte kullanılmıştır. Araştırma sahası Türkiye ve araştırmanın örneklemini Türkiye’de faaliyet gösteren lojistik hizmet sağlayıcılar olarak belirlenmiştir.

Çalışmanın sonuçları hem akademisyenler hem de uygulayıcılar için çeşitli öneriler sunmaktadır. Türkiye 2023 dış ticaret hedeflerini karşılamak amacıyla geniş ölçekli bir lojistik altyapı geliştirme planına ihtiyaç duymaktadır. Lojistik merkezler yüklerin dönüşümü ve hareketini destekleyen altyapının önemli bir parçasını oluşturmaktadır. Bu süreçte müşteri odaklı bir yaklaşım benimsemek ve müşteri beklentilerini ortaya çıkarmak karar vericiler ve bu projeleri geliştirecek olan taraflar için faydalı girdiler sağlayacak, atıl tesislere yatırım yapılmasını engelleyecektir. Bunun yanı sıra, pazarlama teorilerinin lojistik merkez araştırmalarının pazarlama teorileri temelinde yürütülmesi, lojistik kümelenme ve ulaştırma coğrafyası literatürleri için yeni araştırma alanları yaratacaktır. Çalışma, bu uygulama alanlarını ilgili tüm taraflara sunmayı ve lojistik merkez literatüründe az sayıda çalışılan pazarlama-lojistik merkezler alanına katkı yapmayı hedeflemektedir.

**Anahtar Kelimeler:** Çeşitleme, Endüstriyel ağ yaklaşımı, Endüstriyel hizmetler, Endüstriyel pazarlama, Hizmet-baskın yaklaşım, İlişkisel pazarlama teorisi, Kalite fonksiyon göçerimi, Kümelenme teorisi, Lojistik merkezler, Örgütsel satınalma

**PRIORITIZATION OF INDUSTRIAL SERVICE DIMENSIONS IN  
LOGISTICS CENTERS: AN INDUSTRIAL MARKETING APPROACH**

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## ABBREVIATIONS

|                  |                                                                          |
|------------------|--------------------------------------------------------------------------|
| <b>3PL</b>       | Third-party Logistics Service Providers                                  |
| <b>4PL</b>       | Fourth-party Logistics Service Providers                                 |
| <b>ALP</b>       | Airport Logistics Park                                                   |
| <b>B2B</b>       | Business-to-Business                                                     |
| <b>B2C</b>       | Business-to-Consumer                                                     |
| <b>BOT</b>       | Build-Operate-Transfer                                                   |
| <b>BS</b>        | Business Strategy                                                        |
| <b>EDI</b>       | Electronic Data Interchange                                              |
| <b>EFA</b>       | Exploratory Factor Analysis                                              |
| <b>EG</b>        | Economic Geography                                                       |
| <b>EUROFOUND</b> | European Foundation for the Improvement of Living and Working Conditions |
| <b>FV</b>        | Freight Village                                                          |
| <b>FVDC</b>      | Freight Village Development Company                                      |
| <b>GDL</b>       | Goods-dominant Logic                                                     |
| <b>GDP</b>       | Gross Domestic Product                                                   |
| <b>HoQ</b>       | House of Quality                                                         |
| <b>ICT</b>       | Information and Communication Technology                                 |
| <b>ID</b>        | Industrial District                                                      |
| <b>IHIP</b>      | Intangibility, Heterogeneity, Inseparability, Perishability              |
| <b>IMC</b>       | Intermodal Marketing Company                                             |
| <b>IMP</b>       | Industrial Marketing and Purchasing                                      |
| <b>LODER</b>     | Lojistik Derneği                                                         |
| <b>LPI</b>       | Logistics Performance Index                                              |
| <b>LSP</b>       | Logistics Service Providers                                              |
| <b>MNE</b>       | Multinational Enterprise                                                 |
| <b>MRO</b>       | Maintenance, Repair and Operating Supplies                               |
| <b>NPD</b>       | New Product Development                                                  |
| <b>NSD</b>       | New Service Development                                                  |
| <b>OBB</b>       | Organizational Buying Behavior                                           |

|                |                                                                                  |
|----------------|----------------------------------------------------------------------------------|
| <b>PPP</b>     | Public Private Partnership                                                       |
| <b>QFD</b>     | Quality Function Deployment                                                      |
| <b>SDL</b>     | Service-dominant Logic                                                           |
| <b>SSC</b>     | Services that support the customer's actions related with the supplier's product |
| <b>SSC1</b>    | Industrial services group composed of SSP and SSC                                |
| <b>SSC2</b>    | Services dealing directly with the customer's functional processes               |
| <b>SSCN</b>    | Services supporting the customer's network actors                                |
| <b>SSP</b>     | Services that support the supplier's product                                     |
| <b>SUS</b>     | Sustainability                                                                   |
| <b>TEN-T</b>   | The Trans-European Transport Networks                                            |
| <b>TLT</b>     | Transport and Logistics Terminals                                                |
| <b>UC</b>      | Unit Cargo                                                                       |
| <b>UND</b>     | Uluslararası Nakliyeciler Derneği                                                |
| <b>UNESCAP</b> | The United Nations Economic and Social Commission for Asia and the Pacific       |
| <b>UTİKAD</b>  | Uluslararası Taşımacılık ve Lojistik Hizmet Üretenleri Derneği                   |
| <b>WIP</b>     | Work-in-process                                                                  |

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## INTRODUCTION

Being highly related with a diversified portfolio of manufacturing and service sectors, logistics industry has to evolve and adapt rapidly to the upcoming changes in the global and local ways of doing business. The extended supply chains serving to the global markets, never ending economic crisis, increased attention on the environmental and social impacts of business, continuous pressures on costs and profits keep introducing new requirements like small lot but frequent orders, environmentally conscious logistics practices, lower prices for high service levels. These requirements and new approaches resulted with integrated logistics activities, first, within the company boundaries, then outsourced logistics activities to third party logistics service providers (3PLs) and fourth party logistics service providers (4PLs). These efforts to integrate and outsource logistics services have recently combined with clustering initiatives together with environmental pressures and efficiency considerations.

New forms of logistics service clusters are called distribution centers, dry ports, distriparks, logistics centers and many more. These clusters all have self-specific characteristics and are designed to serve to different customer requirements. Logistics centers<sup>1</sup>, which are a form of these clusters, are recently being discussed by both public and private authorities. Their successful examples are already operating in Europe, the USA or Far East. They are also playing a significant role in seaport hinterland integration for global gateways. These important nodes in the logistics system seem to spread to developing countries especially within the common development policies of converged political and commercial regions. However, it is not possible to adopt a standard system solution that is valid for every region or country as the market structure, logistics industry, foreign trade movements, infrastructure capabilities and the customer preferences differ among different points. Customized versions of the market offering are essential in order to avoid idle investments which require a strong market perspective and a customer focus.

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<sup>1</sup>Freight Villages are a commonly used term for logistics centers in Turkey, however the world's terminology is changing towards Logistics Centers so in this study, logistics centers will be used as a synonym for freight villages.

Customer involvement in the product design, product development according to customer expectations, co-creation of value together with network partners and long-term customer relationships where the buyers are seen as active parties in marketing interactions are new approaches to marketing thought. The market transaction is no longer seen as an isolated and a one time exchange. Even the consumer markets of today require a relationship focus and a customized market offering for long-lasting customer loyalty. The industrial markets where the transactions are larger in volume and higher in monetary value per transaction, have been applying this relationship focus for a longer time. Logistics transactions take place in industrial markets where goods or services are stocked, transported or handled for further production or sales. They take place within industrial supply chains that extend globally. The logistics centers that aim to agglomerate logistics activity at specific locations, are nodes in these industrial supply chains and they need to adopt a customer focus when designing, developing or improving their market offerings in order to maintain customer investment. Although they are seen as public undertakings where real estate development and construction are highly prioritized, a marketing lense is essential in order to assure industrial customers' interest in investing these facilities and purchasing their services.

This study makes an attempt to integrate marketing theory with logistics centers by using cluster theory as a mediating theory. The study aims to involve customer focus into the industrial service development process of logistics centers. Quality function deployment (QFD) is used as a tool in order to translate customer expectations into technical characteristics and to prioritize technical dimensions of the logistics center's market offering according to customer preferences.

The research setting is Turkey, a developing country that has an advantageous location between two continents and has ambitious trade targets within national strategic plans. Being a member of the Customs Union and a candidate of the European Union (EU), Turkey adopts many common policies in order to align its regional governance practices and legislation with EU member countries. Establishment of logistics centers in Turkey, is partly facilitated by logistics infrastructure development policies and is partly the result of common environmental policies. However, their aims, the services that they will offer, their ownership

structures and management styles are all pending issues open to discussion. Adopting the European model directly is not feasible due to the differences in the industrial structures, customer preferences and the logistics infrastructure. A model which is specific to Turkey is required. This study aims to explore and define the prioritized dimensions of this model by analyzing the perceptions of the Turkish logistics service providers (LSPs). By involving them to the logistics center's market offering development process, the study aims to adopt a relationship marketing focus. By conceptualizing the industrial service of the logistics center as a co-creation of value by the customers and the providers, the study uses a service-dominant logic.

In order to achieve these aims, first the theories of relationship marketing, industrial network approach, industrial marketing and service-dominant logic are explored. Certain propositions for logistics services are developed with the lenses of these theories. After that cluster theory is used as a mediating theory in order to operationalize the theoretical propositions. The customer preferences and the technical characteristics of the logistics center's market offering are generated through series of qualitative and quantitative analysis. Finally a house of quality (HoQ) is developed in order to translate customer requirements into technical dimensions and prioritizing these dimensions in terms of customers' importance evaluations. Fuzzy logic is used during QFD analysis in order to eliminate the variance in human judgments.

#### **a.The Research Problem**

The complexity of logistics activities has been increasing with volatility of logistics customers' demands, service level pressures, flexibility and agility requirements of global markets and mass customization in highly technological industries. Together with this complexity, it is difficult for manufacturers to perform all of the specialized logistics activities that require high level of expertise in-house. Thus, outsourcing of logistics activities, which was initialized due to efficiency and cost concerns, is now a "must-be" requirement because otherwise they are unable to be performed by parties whom do not possess the expertise. The evolution of this outsourcing process in the logistics industry is currently approaching towards a "one-

stop-shop” style where the service buyers tend to demand a holistic service at a pre-defined service level and the service providers have to prepare customized and state-of-the-art solutions to their industrial customers.

In consumer marketing literature, especially for services marketing, one-stop-shop requirements and the rise of hypermarkets, malls are analyzed within new service trends. Similar trends are followed in the industrial markets as well. If overall industrial markets are divided into industrial goods and industrial services sub-sections, recently formed industrial service clusters can be considered among quite new phenomena for the industrial services literature. They have real-life implications initiated by the practitioners of related fields and academic research efforts explore the concept, the existing structures, the strategic objectives and other issues following these establishments.

Logistics, being defined as the group of activities performed in order to provide the two-way flow of goods, services, information and financial resources between the points of raw materials and final consumers, is actually a service being sold and purchased among organizations. There are some logistics services sold to final consumers as well but these services are out of the scope of this research. So this research starts from the point aiming to conceptualize logistics as an industrial service.

In the special issue of Industrial Marketing Management Journal (volume:37, issue:3) about the rise of industrial services, the editorial article of Jacob and Ulaga (2008) points out several gaps for scholarly research on industrial services. Two of them are (Jacob and Ulaga, 2008: 252):

- *How to systematically study customers' needs in industrial service contexts?*
- *Which processes work best in designing new industrial service offerings that customers are really willing to pay for?*

These two research question examples exhibit a need for academic research on customer requirements and industrial service design match. Positioning logistics under the industrial service paradigm, the cluster of logistics services that provide a one-stop-shop alternative for the industrial buyers, is the main focus of interest in this study. One of the frequently observed cluster of logistics services appear under the title of logistics centers. These organizations are chosen as the application field of

this research. Within the context of industrial service buying and logistics clusters as an industrial service provider, the main problem in this research is to explore and prioritize the dimensions of industrial service design for logistics centers through the combination of industrial service buyers' requirements, benchmark of best examples and logistics service capabilities defined under the industrial service paradigm. While formulating this research problem the geographical coverage of the field research is also important as the criteria and buying behavior will vary depending on the logistics requirements of the research area. This research aims to provide the customer requirements and service characteristics for the new logistics center that is to be established in Turkey. So the research question can be formulated as:

*What are the primary industrial service design criteria according to industrial customers' preferences, in a logistics center to be established in Turkey?*

#### **b.The Aim and the Context of the Study**

In the light of the research question stated above, the main aim of the study is to develop a process for exploring and prioritizing industrial service dimensions in the logistics centers in order to shed the light to the overall industrial service design in such facilities. While achieving this aim, the study aims to define the logistics activities under the industrial service paradigm. The collection of separate logistics activities within the defined areas of logistics centers is a second focus to be researched. This approach is also analyzed from a strategic marketing management point of view as these centers are clusters of services that aim to provide a competitive advantage to the industrial service buyers.

While solving the research problem, the study aims to explore the characteristics of the potential industrial customers of logistics centers, measure their perceptions and tendencies regarding these facilities, analyze the variables that affect their organizational buying decisions and to exhibit their prioritized purchasing criteria regarding logistics centers. In addition to these, the study aims to review the industrial service capabilities of logistics centers from the best examples in the world, the early initiatives in Turkey and the existing literature.

As a result of these efforts, the study aims to explore and verify the customer requirements from logistics centers, their technical capabilities and to prioritize the service design parameters in these facilities through a quality function deployment (QFD) analysis. The output of the research aims to constitute a model for current and future logistics center initiatives.

While making an effort to reach these aims, the research specifies Turkish logistics market as its study field depending on the country's logistics infrastructure, development potential and related industrial investment. However, while forming the model for Turkey, the study aims to cover the existing best examples from different parts of the world and providing a research alternative for developing or improving the industrial service offering in similar facilities.

### **c.The Importance of the Study**

With its crucial position in between different functions of the organizations, logistics is now a fundamental capability for a company to succeed in a highly competitive global environment. As the physical distances between the cities and the countries of the world decrease by intense networks of transportation, the supply chains of the goods and services subject to transaction get longer than before. Managing these chains requires expertise, technological infrastructure, network connections and solid capital.

It is difficult for a single organization to fulfill all of the logistics requirements of today's global companies. So an integrator organization, that will provide synergy, efficiency, speed and security in logistics transactions is a creative solution for today's supply chains' problems. Logistics centers are organizations developed in order to respond these problems.

As they are quite new phenomena, the academic literature for logistics centers is being developed recently. Depending on the review of this literature, the coverage of the studies are generally directed towards classification of logistics agglomeration efforts or utilization of facility location selection methods for new logistics centers. Kayikci (2010) combines a fuzzy analytic hierarchy process with artificial neural networks in order to decide on the appropriateness of the location for an intermodal

freight logistics center. Meidute (2007) develops an economic evaluation model similar with Tsamboulas and Kapros' (2003) study and produces financing scenarios for PPPs. Nathanail (2007) conducts a prioritization analysis for the existing logistics terminals in Central European, Adriatic, Danubian, South-Eastern European (CADSES) regions. She provides a common evaluation framework for terminals, a performance index. Guo-Qi and Jin (2009) propose mathematical notations for the description of urban logistics nodes with a graph theoretic approach. Aulicino and Fioravanti (2007) develop an IT automation model for freight village processes.

Out of the few marketing oriented studies, Bottani and Rizzi (2007) develop a model in order to estimate the freight volume that could be attracted by an intermodal freight terminal which is a market oriented approach that could be used either for a new facility design and location or to assess the performance of an existing facility. Toh et al. (2009) take Melbourne as an example for a logistics city and align the IT infrastructure to meet the challenges of a new business architecture resulting due to the clustered businesses around the periphery.

Nevertheless, the existing studies in the field are mainly gathered around definition and classification efforts, location selection studies or country case analysis. Study of inland ports, regardless of the definition or the specific name given to the facility, is a less studied area in transportation research and should be explored more to fill the gap in this field (Walter and Poist, 2004).

Aifandopoulou et al. (2006) state that logistics industry's demands shape the transportation sector so any policy that wants the logistics industry to adopt new solutions like logistics centers has to discuss with the industry members and align its operations with logistics trends. Logistics trends should match with launched solutions in order to achieve customer oriented development in the industry.

As Meidute (2005a) quotes from Goldfogel – ACME Distribution, the quality services provided by logistics centers are developed for the customers of logistics centers and the aim of a center is to provide and maintain the competitiveness of its members. So an effective industrial service design in a logistics center should be based on business requirements and transportation infrastructure conditions.

Within this framework, Stank and Roath's (1998) effort is the first to explore shipper preferences in a logistics facility development. It is followed by Walter and

Poist's two studies (2003; 2004) that extend customer requirement exploration to LSPs from manufacturers around inland ports. A similar strategic evaluation with a customer focus has been made for an air hub in Korea based on regional cluster theory (Lee and Yang, 2003). In a recent study, Liang et al. (2012) use the same methodology with this study, a fuzzy QFD application, to a port logistics center in China but their aim is to improve the existing service quality not developing the initial service offering. As a result, to the best of the researcher's knowledge, there are no studies focusing on logistics centers from the industrial service paradigm and making an effort to prioritize the industrial service dimensions that will be provided by these facilities with a customer focus. This is an important contribution of the study.

In addition to these, logistics is a continuously and rapidly changing industry which has a shorter acknowledged history in Turkish business environment when compared to Europe, Far East and the USA. While integrating all logistics activities into business other than traditional transportation and warehousing processes, Turkish markets have also started outsourcing these activities. As a result Turkish 3PL and 4PL companies have been established and global players in these fields started to invest in Turkey in order to provide their services here.

Turkish policy makers have announced strategic targets for the year 2023 which is the 100<sup>th</sup> year of Turkish Republic. The overall foreign trade target is set as USD 1.200 billion and the sole export target is set as USD 500 billion. Turkey wants to take its role as a logistics base between Asia and Europe and aims to attract new investments in this industry. In accordance with these developments, during the last five years, logistics centers started to be discussed among policy makers and the industry representatives. Some investments and initiatives have been realized both by the public authorities and the private sector. However, there is not a fully operating logistics center similar to its examples in the world for the moment. An analysis of the LSPs in terms of their preferences for logistics center services is also an essential contribution for public policies of the country. The results of the study aim to provide inputs for the undertakers of these facilities and avoid idle public investments that the private sector does not participate.

Adopting marketing's theoretical lense, providing an industrial service design effort through a QFD analysis, exploring the requirements of Turkish customers and modeling the prioritized service dimensions of a logistics center to be established in Turkey, this study claims to have importance for practitioners in the logistics industry, policy makers in Turkey and the scholars that aim to work in the field.

#### **d. The Research Design of the Study**

The research design part of this study aims to specify what the study wants to find out exactly, define the boundaries of research and explore in order to validate the selected way to achieve these aims; i.e. the research method.

In social sciences, in order to understand a situation, the factors constituting that situation should be modeled. While modeling the process, the inquirer may pursue two different approaches: non-empirical and empirical. Scientific research, especially driven by the positivist paradigm, requires the empirical approach where the knowledge is gathered through the systematic observation of the world through five senses. However, integrated thinking with non-empirical sources of information such as common knowledge or authority reference guides the researcher in terms of logical foundations of the study and the best usage of time (Black, 2005).

Research studies are based on theories which are *sets of interrelated concepts, definitions and propositions that are advanced to explain and predict facts* (Cooper and Schindler, 1998: 47); and they try to investigate, confirm or verify these theories. The dynamic structure of theories and the falsifiability (Popper, 1983; cited by Caldwell, 1991) requirement of science cause once firmly set theories to change and sometimes discarded totally if the competing paradigm explains the new theory better than the old one (Kuhn, 1970). This improvement process in theories is explained by the inductive tendency of theory formation by Black (2005).

The approach to the explanation power of social sciences is somewhat different than the natural sciences. Social inquiry is probabilistic, so it tries to predict the few causes of social events that explain them the best. This approach is also called the nomothetic model of explanation when compared to the idiographic model of explanation that tries to find an exhaustive list of all probable reasons of the social

outcome that is being explored (Babbie, 1995). So when the purpose of this research is being determined, the researcher is well aware that the industrial service design criteria aimed to be found at the end of the research, won't contain the whole industrial customer requirements from a future logistics center. Keeping in mind that a scientific research question needs to have the ability to be approached by verifiable observations of the conditions under question (Singleton and Straits, 2005); it can be stated that this research tries to observe various conditions that best reveal the industrial buying criteria from a logistics center.

Theoretical research generally tries to test, validate or formulize theories. There is another subfield of research where the aim is to evaluate and provide optimum solutions for real world problems and it is called applied research (Black, 2005). This study adopts a mixed approach where the first effort is to refine a conceptual model of logistics centers with an industrial services marketing lense; the second effort is to explore the industrial service design criteria for the logistics centers where applied research is undertaken.

The reasoning behind theory generation is twofold: inductive and deductive. Scientific process is a cyclical one starting from observations inducted to empirical generalizations and theories and deduced to hypotheses and observations again (Singleton and Straits, 2005). However, there are instances in research when pure induction or pure deduction is not applicable. Sometimes the research starts not from an established and existing strong theory or solely empirical observations of phenomena, but from an 'intuitive leap' (Taylor et al., 2002: 315). This intuition may start with a rare observation which is not able to be explained by the existing theories or with an attempt to approach to reality with alternative theories (Spens and Kovacs, 2006). This type of reasoning is called abductive reasoning and is generally supported by a research approach which is named as 'systematic combining' (Dubois and Gadde, 2002: 554) or 'theory matching' (Spens and Kovacs, 2006: 377).

The research process starts with a set of observations which may be deviating from existing knowledge so exhibiting an anomaly, or with some observations which the researcher wants to explain from a different perspective and by employing different theories. So the empirical observations are tried to be matched with existing suitable theories during the theory matching process. After exhaustive iterations are

carried out for theory matching, new theory, hypotheses or proposition suggestions are stated (Kovacs and Spens, 2005). As logistics field borrows majority of its theories from other disciplines like marketing, management, production or economics, this type of reasoning approach is appropriate for logistics research (Arlbjørn and Halldorsson, 2002; Stock, 1997).

In this study, several different marketing schools and cluster theory are used as the theoretical lense to the logistics center concept. They are utilized in an abductive manner to propose the theoretical base of the research which takes a customer perspective for designing the market offering of a logistics center. The discovery of the industrial buying criteria of logistics center customers is being tried to observed through qualitative methods like focus group studies, content analysis and interviews. These observations are used as inputs for the quantitative survey study and survey study results formulate the QFD model. This model is tested deductively in order to shed the light for the industrial service design by the help of fuzzy QFD technique. Although there are several established logistics centers which are functioning well, to the best of the author's knowledge, a theoretical framework that observes these clusters from the perspectives of industrial marketing and industrial network theories does not exist other than some niche studies concentrating on port-centric logistics activities (Woo et al., 2012) or humanitarian logistics clusters (Jahre and Jensen, 2010) and one dissertation (Nyholm, 2011). The adoption of abductive reasoning through this research process and the effort to match the observation with existing industrial marketing theories will lead to the prioritization of industrial service dimensions for a logistics center to be established in Turkey. To complete the scientific process, future studies should test the general model, deduce hypotheses and verify the results.

While completing this scientific cycle, two main types of evidence gathering approaches may be used together. These are qualitative and quantitative methods where the former collects data from few subjects but investigates the variables in great depth; the latter analyzes data collected from a large sample that represents the population which is aimed to be predicted. The employment of these two methods together either sequentially or simultaneously is called triangulation (Tashakkori and Teddlie, 1998).

Triangulation, is a type of research design that focuses on the multiple positions that a specific phenomenon is observed. It is particularly used by social research in order to solve the research problem by using different methods and thus look at it from different perspectives (Neuman, 2003). This method is firstly used by Campbell and Fiske (1959) when searching psychological traits. Followed by new social research using multi-methods, triangulation was classified under four main headings by Denzin (1978; cited by Tashakkori and Teddlie, 1998: 18): triangulation of data, triangulation of observers, triangulation of theory and triangulation of method. When the methods are triangulated, quantitative and qualitative methods of research are being applied either sequentially or simultaneously (Neuman, 2003).

The difference and the critics on triangulation depends on the paradigm differences underlying qualitative and quantitative research methods. While quantitative research methods are being used by researchers adopting the positivist and postpositivist paradigms, the qualitative research methods are generally adopted by constructivist, interpretivist and sometimes critical paradigms (Neuman, 2003; Tashakkori and Teddlie, 1998; Cresswell, 2003). Triangulation on the other hand claims to unite the strong traits of both qualitative and quantitative methods and complete the missing points that quantitative or qualitative methods alone can not fulfill. The paradigm under this research design is called pragmatism (Tashakkori and Teddlie, 1998; Cresswell, 2003).

Although the method is promising especially in terms of its complementary structure, it is kept being criticized due to the ontological and epistemological differences of methodological approaches being adopted in social research (see e.g. Blaikie, 1991). Confirmatory reasons for critics are also suggested in terms of incommensurability of paradigms, lack of precision in qualitative research and lack of informing resources for guidance through triangulated research (Srnrka and Koeszegi, 2007). These criticisms resulted in little effort employed in triangulated research throughout overall research in social sciences. Trumbo (2004), by analyzing 2649 articles among eight communication journals found out that triangulation is rarely adopted. Similar literature research has been conducted on the area of marketing and it is found out that triangulation has a significantly low share out of the marketing journals that were subject to the studies (Hanson and Grimmer, 2007;

Şakar, 2011). However, due to the inability to arrive practical solutions and inability of sole quantitative research to respond the whole population's problems thoroughly, convergence of qualitative and quantitative methods is required (Brannen, 2005).

Despite the opposing points of view regarding triangulation, the adoption of multi-method approach would recover the deficiencies of a monomethod indeed (Johnson and Onwuegbuzie, 2004). However, triangulation should only be used if the method really contributes and strengthens the findings of a study. Otherwise, adopting a pluralistic methodological approach would end in conflicting results especially when the study is poorly conducted (Thurmond, 2001).

The research problem and the purpose of the study has a critical role in deciding on the methodology. The paradigm being adopted is again an important issue. In this study, the research question is exploratory in its nature as the aim is to define how the industrial service of a future logistics center to be established in Turkey should be designed. Although there are some successful examples in the world, it is not feasible to copy these examples exactly and accept them as the only correct implication of the concept. Service is heterogeneous in its character and both the macro and micro structures influencing the establishment of a logistics center in Turkey differ from its counterparts in EU, Asia or the USA. So the solution would be limited if this research problem is approached from a logical positivist paradigm aiming to find one single reality.

However, the model that is attempted to be built in this study, is not an assumption of multiple realities and also is not bound to the values and subjective evaluation of the researcher. The criteria is derived empirically, however the vagueness of the social phenomena is tried to be managed by employing a fuzzy approach to the data collection and analysis part of this study.

When all these issues are taken into consideration, the paradigm underlying this research can be defined as pragmatist. Pragmatism deals with the problems and the situations in which those problems appear, the actions, the results of these problems instead of realists' focus on antecedents and causal relationships (Cherryholmes, 1992). The researchers have the freedom to choose the method that they want to work with in order to reach the consequences and they mainly believe that research occurs in social, political, historical or other contexts (Creswell, 2003).

Logistics centers are a very new phenomena for Turkey. They have a multi-dimensional structure including the state, the private sector, the foreign trade policies and international investments. This construct should be studied from multiple angles both with a macro orientation and also with a micro orientation as the attempted service design will be bought and used by many different companies operating in logistics industry. The complexity of the construct, requires the employment of more than one research method and empirical investigation of both quantitative data on service preferences and capabilities and qualitative data on perceptions and behavior regarding logistics centers. The aim is to secure a generalizable solution to service design problem in logistics centers to be established in Turkey with a customer perspective so the qualitative research is supported with quantitative research in order to make generalizable conclusions.

Usage of triangulation method in logistics research has been increasing (Frankel et al., 2005) even though quantitative research methodology which is the product of a positivist paradigm approach is still dominant in the field (Mentzer and Kahn, 1995; Naslund, 2002). According to the content analysis of 378 papers published by three main logistics journals between the years 1998-2002, 9% of the articles adopt the usage of qualitative and quantitative methods together (Spens and Kovacs, 2006). Mangan et al., (2004) attempts to prove that the employment of triangulation in logistics research should increase as it appears to be more beneficial in terms of research results. So the study design that uses more than one research method taking advantage of their different strengths would be fruitful for the intended results of this research.

The overall research process has two main stages: planning and execution (Black, 2005). The social inquiry, which corresponds to the execution part of the research process, has two main activities: measurement and interpretation (Babbie, 1995). The total research design should contain these stages all. With the light of above discussed theoretical and methodological approaches, Figure 1 shows the research process of the current study.

The research process starts with the research interest which is the service design in logistics centers for this study. It is followed by an idea which is either supported by current knowledge or prior investigation of related literature. Once the

purpose of the study is established the theories which will be explored in order to build up the research are determined. After that either in a sequence or simultaneously the conceptualization of specific constructs which will be analyzed through the research process should be undertaken. The research methods that will be employed are chosen. The sample and population regarding the research are specified. The research methods are operationalized by developing the necessary tools. Then the research is carried out and completed through observation, processing, analysis and interpretation phases. This research process figure and phases are adapted from Babbie (1995).

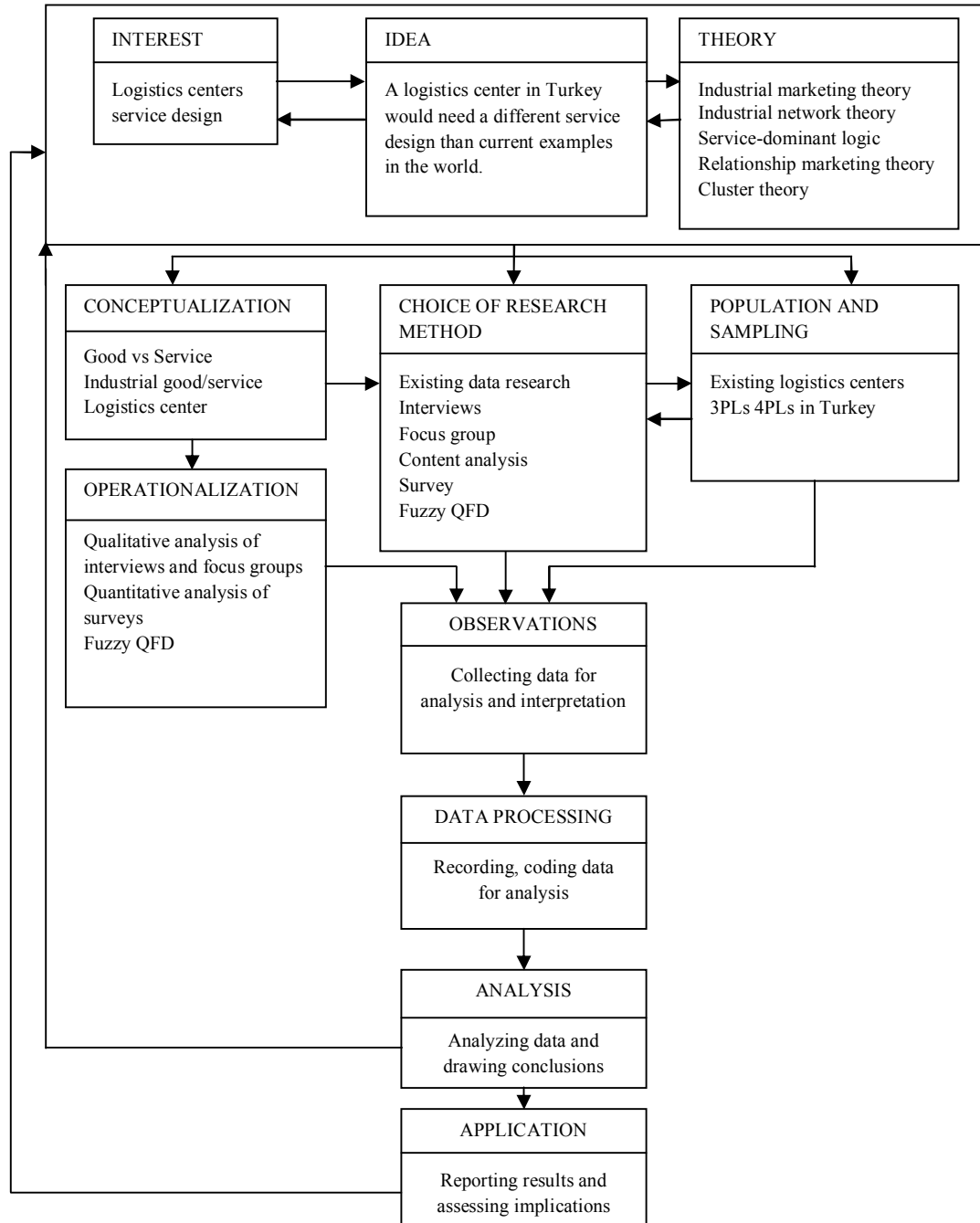
Research design also has to clarify several research elements. The first one is the purpose of the research which may be exploratory, descriptive or explanatory. Although the characteristics and methods of these research purposes differ, generally most research carry the properties of all three (Babbie, 1995). This research, also, aims to explore the organizational buying criteria for a logistics center to be established in Turkey, which is a new area of study as the existing models are generic ones and this effort focuses on only complex organizations as logistics centers. The study also makes an exploratory effort to classify the technical characteristics of a logistics center. The descriptive aim is to define the types of the industrial customers, their preferences, classification of companies located in a logistics center, the management style, the ownership style. The explanatory aims are to find out the variables that explain the service buying intentions of industrial customers from logistics centers and to translate these customer requirements into technical capabilities of logistics centers.

The second element is the unit of analysis in the research. Units of analysis in a study are typically also the units of observation (Babbie, 1995). In this study the unit of analysis are the organizations that would form the members of a future logistics center to be established in Turkey. However, while searching to explore the buying centers of these organizations, the unit of analysis will be the individuals representing the organizations.

The point of focus in the study is the orientations (general tendencies, inclinations) of the possible future customers of a logistics center. The characteristics

or actions of these actors may be referred throughout the study bu they don't constitute the main point of focus.

**Figure 1.** The Research Process



Source: Adapted from Babbie, 1995: 113

When the time dimension is considered, the study is a cross sectional study, so takes only a point in time as a basis and makes an observation at that time. The summary of the research design criteria is exhibited on Table 1.

**Table 1.**Research Design Criteria

|                             |                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------|
| <b>Research Approach</b>    | Empirical                                                                                        |
| <b>Model of Explanation</b> | Nomothetic                                                                                       |
| <b>Explanatory Power</b>    | Probabilistic                                                                                    |
| <b>Research Type</b>        | Applied Field Research                                                                           |
| <b>Reasoning Method</b>     | Abductive                                                                                        |
| <b>Research Method</b>      | Triangulation(Focus Group, Content Analysis Interviews, Survey and Fuzzy QFD)                    |
| <b>Research Purpose</b>     | Exploration and Explanation (Description contributes to the process but is not the main purpose) |
| <b>Unit of Analysis</b>     | Organizations (systems) (also individual when searching for the buying criteria and intention)   |
| <b>School of Thought</b>    | Pragmatism                                                                                       |
| <b>Point of Focus</b>       | Orientations                                                                                     |
| <b>Time Dimension</b>       | Cross-sectional                                                                                  |

#### **e.The Theoretical Foundations of the Study**

Services paradigm has a long history of debate with the goods paradigm especially in marketing literature. The initial schools of marketing like the commodity school (Copeland, 1923) and the widely accepted ones like the marketing management school which is established and developed by marketing pioneers like Joel Dean, Ted Levitt, Neil Borden and Philip Kotler (Sheth et al., 1988) are criticized for their sole focus on the physical products and consumer marketing. The establishment of Industrial Marketing and Purchasing Group (IMP) with an interactive/network approach towards marketing by the Scandinavian school during 1960s (Baker, 2010) resulted in a paradigm shift in marketing towards relationship marketing (Grönroos, 1994a). The service-dominant logic introduced by Vargo and

Lusch (2004a) has been accepted by this pole of the debate where services are the core concept that covers all goods and services being marketed.

One other classification in marketing theory is done over consumer and industrial markets. The marketing methods, applicable marketing strategies, buyer behavior theories all vary depending on the market being either a consumer or an industrial market. There are several former studies on industrial marketing management (e.g. Webster, 1991; Marrian, 1968; Wilson, 1968; Haas 1989) and some recent text books are published some of which are written under the title of 'business marketing' (e.g. Havaladar, 2005; Brennan et al., 2011; Dwyer and Tanner, 2008).

This study aims to build up the prioritized customer criteria for the industrial service design of a logistics center to be established in Turkey. So the basic paradigm leading the study is not solely the services paradigm but the industrial services paradigm. The relationship marketing theory (Gummesson, 1994a; Grönroos, 1994a), the service-dominant logic (Vargo and Lusch, 2004a), industrial marketing theory and industrial networks (Hakansson, 1982) and the cluster theory (led by different schools) are the theoretical lenses of this study.

When the studies held under industrial service design are evaluated, the number of studies are quite low (only 5 when searched by Google-academic) and majority are from the field of logistics mainly from shipping industry. When the search term is changed to industrial service development than de Brentani's (1989; 1991; 1995) work is found to specify the stages of industrial service development and how the process results with either success or failure. Matthyssens and Vandenbempt (1998) and Weerawardena and McColl-Kennedy (2002) focus on the competitive advantage that new industrial service development creates. Goldstein et al. (2002) combine the service concept with service design process in order to improve it and integrate the customer requirements with an organization's strategic intent. Jaw et al. (2010) state a meaningful relationship between service characteristics, market orientation, and actualizing innovation effort and new service development success. There are also other studies focusing on new service development process (not only industrial services but all services) (e.g. Scheuing and Johnson,

1989;Bowers, 1989; Johnson et al., 2000). No similar research examples could be found in Turkish literature regarding new service design or industrial service design.

In order to successfully match the service package with the customer requirements and the service organization itself, organizations have to pay attention to their service design processes (Goldstein et al., 2002). A tool that translates customer requirements into product / service specifications (Govers, 1996) and so which is used throughout the product / service development process (Chan and Wu, 2002) is QFD. Fuzzy logic approaches have been utilized together with QFD in order to deal with the vague, subjective nature of customer and organization evaluations in terms of requirements and specifications respectively (see Chan and Wu, 2002 for a detailed discussion).

Fuzzy set theory or fuzzy logic are comparatively new reasoning approaches when the classical set theory or classical logic are considered. The main reasoning methodology of classical theory rests under the assumptions of the independence of subjects and objects or body and mind. The classical theory defends the existence of an event which relates these subjects and objects and this relation or event has a dichotomous nature which can be stated as black or white, existing or non-existing. So with all these approaches the classical theory has an objective, certain and empiricist epistemological structure (Türkşen, 2006).

Fuzzy set theory on the other hand defends the fact that objects in the world do not have a 'precisely defined criteria of membership' (Zadeh, 1965: 338). This situation creates a fuzzy set which contains elements that possess a continuum of grades of membership regarding with their sets. The basics of this theory relies under the fact that 'human decision making process is not probabilistic but possibilistic in nature' (Zadeh, 1978: 4) and the linguistics variables should be converted to numbers in such a manner that they are assigned to a possibilistic distribution (Zadeh, 1978). Fuzzy logic uses a methodology which is called Computing With Words and aims to translate these words into fuzzy numbers when using directly numbers is not applicable because the information collected is imprecise (Zadeh, 1996).

There is quite an amount of research which applies fuzzy logic to QFD in different fields. The method is also applied in logistics and supply chain management fields by several researchers. A list of the existing literature is exhibited in Table A1

in Appendix. As a result of the literature survey, no research has been found that applied fuzzy QFD methodology to new industrial service development or logistics centers at all. Only Lin and Pekkarinen's (2011) study makes an attempt to design a modular logistics service but with the help of traditional QFD analysis. So this research aims to contribute to the literature with specifying the customer requirements from logistics centers, determining the technical characteristics of their services, drawing a framework for the prioritized service dimensions in logistics centers, applying fuzzy QFD methodology to industrial service design process in logistics centers. In order to reach these aims, the research adopts an abductive approach and evaluates the research phenomena through the theoretical lenses of relationship marketing, industrial networks, service-dominant logic, industrial services marketing, organizational buying and cluster theory. These lenses lead the way to the analysis of research questions and they support the development of the theoretical framework. Triangulated research steps facilitate the analysis and they provide the tools for exploring, explaining and validating the research results.

## **SECTION I**

### **LOGISTICS CENTERS: INDUSTRIAL MARKETING APPROACH**

Logistics centers are new forms of logistics agglomeration that are observed in today's highly globalized and networked economy. They are the new nodes in global supply or demand chains and they connect many different actors for a more effective facilitation of the logistics flows. Due to the highly complex structure of global supply chain processes and logistics functions, this industry becomes a populated one with new intermediaries joining everyday to perform different actions. Millions of transactions take place between these members in order to keep the logistics pipelines flow for the satisfaction of the final consumer. Logistics centers are clusters that are established to unite these transactions in certain geographic points in order to ease and enable the production of the logistics service. As these transactions take place between different organizations, the exchange market is said to be an industrial market and the subject of exchange is said to be industrial services. The logistics center organization is a part of this industrial market and it produces an industrial service for the existing and potential inhabitants. For gaining success in the industrial markets they serve, it is essential for logistics center organizations to adopt a marketing lense towards their transactions and networks.

The overall marketing thought is divided into four broad eras by Wilkie and Moore (2003). These are:

- a- Pre-Academic Era that consists of ancient age philosophers as well whom developed theories about how buyers and sellers shall exchange goods.
- b- Traditional schools of marketing between 1900-1955 approximately where the focus is on functions, intermediaries and product classes in marketing.
- c- Paradigm shift towards modern marketing management and demand generation activities between 1955-1975.
- d- Paradigm broadening era which is mainly led by Marketing Management School and other new schools after 1975 and enhanced marketing's focus from business activity to a societal basis.

The last era of marketing has faced with the rise of many different schools of thought that criticized the existing approaches and introduced new theories related

with the focus, objectives and the tools of marketing. Among these services marketing theory, industrial marketing theory, industrial network theory, relationship marketing theory, service-dominant logic can be listed as examples.

The essence of marketing is the “establishment of mutually satisfying exchange relationships” (Baker, 2010: 3). A market offering of anykind is designed, provided and promoted for the target markets in exchange for a value. The relationship emphasis in the above expression refers to the tie that marketing exchange builds everytime it occurs and the value of this tie is the real value generated by the marketing action. Long-lasting relationships between the actors of the marketing action should be the main aim and the success of any marketing transaction. Relationship focus, on the other hand, is an essential part of industrial market transactions as they have a long-lasting structure based on trust and mutuality.

This mutuality involves both sides of the exchange action whom are the provider and the buyer in general. However, a broader view of the exchange action exhibits a larger network than a dual relationship. This larger network includes all parties that affect or that are affected by the exchange that takes place and these parties all have various strength degrees in changing the final evaluation regarding the exchange act. The relationship structure is highly influenced by the strength of these network members.

This study adopts a marketing point of view to logistics clusters and chooses logistics centers among these clusters as the main research unit. Thus the main theoretical framework of the study makes an effort to link the several customer oriented and relationship oriented marketing theories to the logistics center concept, defending that the logistics center is a service producing entity to industrial markets and thus requires an industrial marketing approach.

This section makes an effort of theory matching through evaluating the thoughts of relationship marketing theory and industrial network approach. These two main theories lead the way towards the conceptualization of logistics centers’ industrial market offerings and assists in deriving a customer-oriented view to value generation through these clusters.

## **1.1. RELATIONSHIP MARKETING THEORY**

### **1.1.1. A Short Review of Marketing Management School**

As the adopted marketing theories are the more recent theories when compared with dominant schools in the literature, it is essential to refer to their evolution process as well. These theories are generally built upon the neglected parts of dominant marketing theories and develop their propositions by criticizing the accepted fundamentals of them. That's why it is necessary to analyze relationship marketing theory after a brief summary of marketing management school which is a dominant school in marketing literature.

Together with an increased attention on business, around early 1950s, some scholars from the economics field have started to deal with translating vague and abstract theories of economy to daily executive decisions. This situation created a managerial perspective and effected other areas as well (Sheth et al., 1988). Marketing was one of these areas where the methods for marketing goods and services became an important issue. So it was no longer about what to market, through whom to market but the main idea was how to market (Shaw and Jones, 2005).

Managerial school has dominated the field since late 1950s and early 1960s. The major contributors to this school can be listed as Joel Dean, Peter Drucker, Ted Levitt, Jerome McCarthy, Neal Borden and Philip Kotler (Baker, 2010). Marketing concept and customer orientation arose from the classical article of Ted Levitt (1960) which is called "Marketing Myopia". Accepting that consumers have different needs and motives for purchasing products, it became an important issue to segment (Smith, 1956) them in different markets and prepare marketing plans according to the characteristics of these segments. Another important contribution was the introduction of product life cycle concept through which the product lines were easier to be managed with different marketing packages. Apart from these, one of the major developments contributed by managerial school was the invention of marketing mix (Borden, 1964). The marketer was defined as a decider who decides to mix certain types of ingredients in order to tailor the best-fitting marketing program for a specific market offering.

As the school developed with new knowledge created, the scope of marketing was broadened by several scholars. Webster (1992) stated that this broadening should be starting from the marketing function within the firm and align the marketing function with channels, strategic partnerships and relationships. Lazer (1969), on the other hand, suggested that marketing should enhance its application field from sole business to the whole society. This approach was mainly adopted by the macromarketing school. These views were afterwards enhanced by marketing for non-profit organizations and megamarketing concepts where marketing was broadened to all areas other than the traditional business area (Kotler and Levy, 1969; Kotler, 1986).

The contributors to managerial school are very large in number due to the dominance of this school in the field. Majority of the concepts developed by this school are largely being utilized in the industry by practitioners and in universities by academicians (Sheth et al., 1988). However, despite the broadening efforts, there are some critics stating that marketing management school is single-unit oriented with a micro perspective and that takes a supply side approach where the seller is active and the buyer is passive (Hajikhani and LaPlaca, 2012).

While, marketing mix approach was becoming a normative application to all marketing practice and theory in the USA in 1960s, the new approach starting in Europe, mainly Scandinavia was focusing on interaction and network between the exchange parties, marketing of services and relationship marketing theories (Baker, 2010). Long lasting relationships combined with varying roles of different parties in a network (mainly an industrial network) changes the initiator role of the seller or marketer which is valid in marketing management approach and thus enables the buyer to be active in the marketing process (Grönroos, 1994a). Some scholars like Grönroos and Gummesson see the subfields of relationship marketing and industrial networks highly interrelated so they combine the research under the term relationship marketing (Möller, 2010). That's why the relationship marketing theory has a special importance in building industrial services marketing perspectives.

### 1.1.2. The Relationship Focus in Marketing

The criticism about the largely established and colonized marketing management school and its marketing-mix theory (Gummesson, 2002a), has resulted in new paradigms developed by scholars coming from different disciplinary backgrounds. The main argument against marketing-mix theory is that it does not have an interactive nature among its elements and despite its pedagogical ease of use it conceives the seller as the active party and the buyer as the passive party in marketing transactions (Gummesson, 1994b). Relationship marketing is discussed as a paradigm shift in marketing that adopts a relationship focus against the traditional focus on transactions (Webster, 1992). It is *marketing seen as relationships, networks and interaction* (Gummesson, 1994a: 5).

In a study which analyzes twenty-five different definitions of relationship marketing, seven basic dimensions of the term's definition are extracted. These are creation, development, maintenance, interactive, long-term, emotional content and output dimensions (Harker, 1999). According to the results of the content analysis, although none of the definitions involved include all seven dimensions within, the definition made by Grönroos (1994a) covers six of them and is mentioned as the "best" in terms of its coverage. It is defined as (Grönroos, 1994a: 9):

*"Relationship marketing is to identify and establish, maintain and enhance and when necessary also to terminate relationships with customers and other stakeholders, at a profit, so that the objectives of the parties involved are met. This is achieved by a mutual exchange and fulfilment of promises."*

Its scope is quite wide, covering several subdisciplines like services marketing, industrial marketing, database marketing, marketing research, consumer behavior, marketing channels and international marketing (Sheth and Parvatiyar, 1995). That's why it has a fragmented nature of theoretical frameworks and ideas.

Although some scholars view the relationship marketing term as an umbrella term for all these fields, Möller (2010) analyzes existing theoretical background and divides this umbrella term into two approaches: market-based relationship marketing and network-based relationship marketing. The study also compares four domains constituting relationship marketing and synthesizes them under consumer relationships and inter-organizational relationships headings. These domains are

database and interactive marketing, services marketing, channel research, interaction and networks. Möller and Halinen (2000) states that the nature of relationships in market-based and network-based relationship marketing differs in terms of complexity or standardization, individualistic or organizational, seller-maintained or mutually dependent so specific domains of exchange should be explained through contingent approaches that are suitable to their market environment.

According to Sheth and Parvatiyar (1995) relationship marketing was there back in the pre-industrial era when the majority the economic activity was dependent upon agricultural production and the trade of arts. Marketers and buyers had direct interaction during the exchange process and trust and long-term relations had an important role in transactions. The producer and the buyer were separated during the mass production years of industrial era when the producers were only keen on increasing production and selling this excess stock through market intermediaries. So in this era middlemen with sole transactional focus were required to create time and place utility of the marketing function. The marketing organization separated the user of industrial products with the producer and developed gatekeepers whom were composed of professional buyers but not the real users.

However, the competitive advantages of administered vertical channel structures and the benefits of repeated customer purchase attracted the attention of marketers in terms of the importance of well established relationships. The post-industrial era introduced a new type of product which is a form of system integration where the main product, parts, supplies and services are combined for customized use (Shapiro and Posner, 1979). Master purchasing agreements forced companies to form key account management units (Shapiro and Wyman, 1981) where the key account manager is responsible from the analysis of customer needs and match company offerings with these needs.

The focus shift towards relationships instead of transactions has certain reasons in the post-industrial era. These are the advancements in technology, the adoption of total quality management (TQM) practices, the growth of service economy, organizational development processes and the increase in intense competition (Sheth and Parvatiyar, 1995).

Combination of different technologies like computer technologies and machinery production require long term alliances between organizations. Supplier partnerships and customer focus are among the basic principles of TQM (Besterfield et al., 2003) which require long lasting relationships with these partners. The increasing share of services especially in developed countries and the inseparability characteristics of services incur the need of emotional relationships between the service provider who produces and distributes the service and the customer whom directly obtains and uses the service (Sheth and Parvatiyar, 1995). Therefore, relationship marketing focus is important for services marketers (Crosby et al., 1990).

The organizational development process enlarges the buying center of the organization which was the isolated procurement department during the industrial era. In the post-industrial era users of industrial products and services are able to interact and cooperate with the providers of these (Sheth and Parvatiyar, 1995). In addition to these developments, under the intense competition conditions available in both global and local markets it is less costly for the marketers to retain customers instead of battling for new customers (Rosenberg and Czepiel, 1984).

Relationship marketing is also defined as involving customers, suppliers and other related partners into a company's marketing program development activities (Shani and Chalasani, 1993). Sheth and Parvatiyar (1995) gives the example of home-building process where the customer is involved in the design, production and marketing processes of the house that he / she will live. This example is also valid for an industrial product or industrial service buying process.

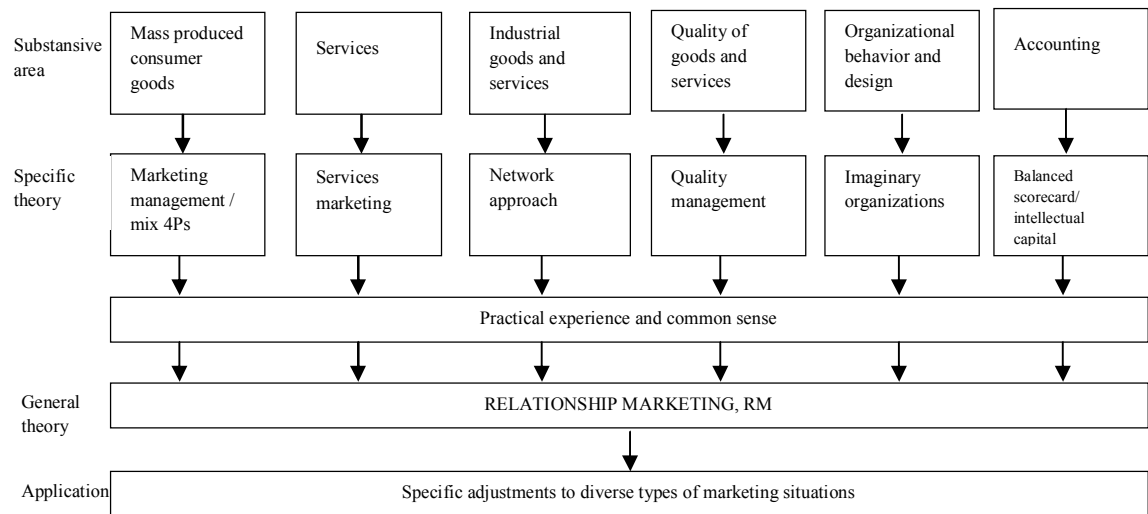
The interaction/network approach to industrial marketing studies state that there are many reciprocal relationships within a network and all the exchanges taking place in this network has an influence on the positions of the different parties in the network (Grönroos, 1994c). In order to sustain long term relationships between marketers and customers, the traditional borders of the marketing function should be opened and part time marketers (Gummesson, 1991b) in the company should be recognized. These part time marketers are the other employees of the company working in design, production, deliveries, logistics, invoicing, finance and the like

and all of them have serious customer interface where they find opportunities to build and enhance relationships with customers.

According to Gummesson (1994b) there are three classic relationships in marketing which are the dyad between the customer and supplier; the triad between customer, supplier and its competitors and the network of physical distribution. The network of a focal company is highly complex, technological and involves a large number of companies and people which can change in size and shape through time. In this kind of an industrial environment, *marketing becomes the creation, utilization and maintenance of this network* (Gummesson, 1994b: 33) which is run through multiple relations. These network structures require a different type of marketing management which is based on the relationship focus.

After all, any marketing paradigm should be based on the marketing concept which is defined as *the notion that a firm is best off by designing and directing its activities according to the needs and desires of customers in chosen target markets* (Grönroos, 1994c: 349). Business to business services are oftenly served through long-term relationships rather than formal and discrete transactions (Ivens, 2005). Relationship marketing paradigm utilizes the relationships within the dyad or the whole network in order to understand customer requirements and design the marketing program according to these requirements. It is essential for customization and it is essential for customer focus. In order to design an industrial service offering, the marketers need to have a relationship marketing approach towards the network that this industrial service will serve.

**Figure 2.** Route to a Relationship Marketing Concept



Source: Gummeson, 1998: 244

As Figure 2 states, relationship marketing theory receives inputs from different areas of marketing, organization theory, quality management and accounting. All of these inputs are related with different theories and constructs which have real life implications handled by practitioners. These real life experiences and common sense are used to combine highly fragmented theories under one broad theoretical approach. However, every case that is analyzed with a relationship marketing approach initially, will carry contingent perspectives depending on the combination of ingredients that the case carries (Gummeson, 1998). The focus of analysis in this study, is an industrial organization with a complex network and thus this case also approaches the research problem also from the network theory perspective.

## 1.2. (INDUSTRIAL) NETWORK THEORY

Theoretically if relationship marketing is viewed as the philosophy of marketing, International Marketing and Purchasing (IMP) Group approaches may be evaluated as the framework for marketing practice. In addition, relationships generally exist in networks (Lehtinen, 1996). So these two topics are highly

integrated and the links between them change their positions depending on the point of view a research or practical problem takes.

Business marketing and its basic elements were challenged by the IMP Group thirty years ago (Hakansson, 1982) with the themes of interaction, network and relationships (Turnbull et al., 1996). The interaction approach challenged the passive market view of the managerial perspective and defended that the supplier and the buyer both have active roles in initiating, developing and designing the transactions between them. The relationship approach challenged the isolated and one-time interaction that takes place when a buyer enters in a market and makes a purchase and defended that there are ongoing transactions between these buyers and sellers which require long lasting relationships (Ford and Hakansson, 2006). The network approach challenged the isolated individual firm idea with its environment formed of actors, resources and activities where they form a technosocial system called the network (Möller and Halinen, 1999).

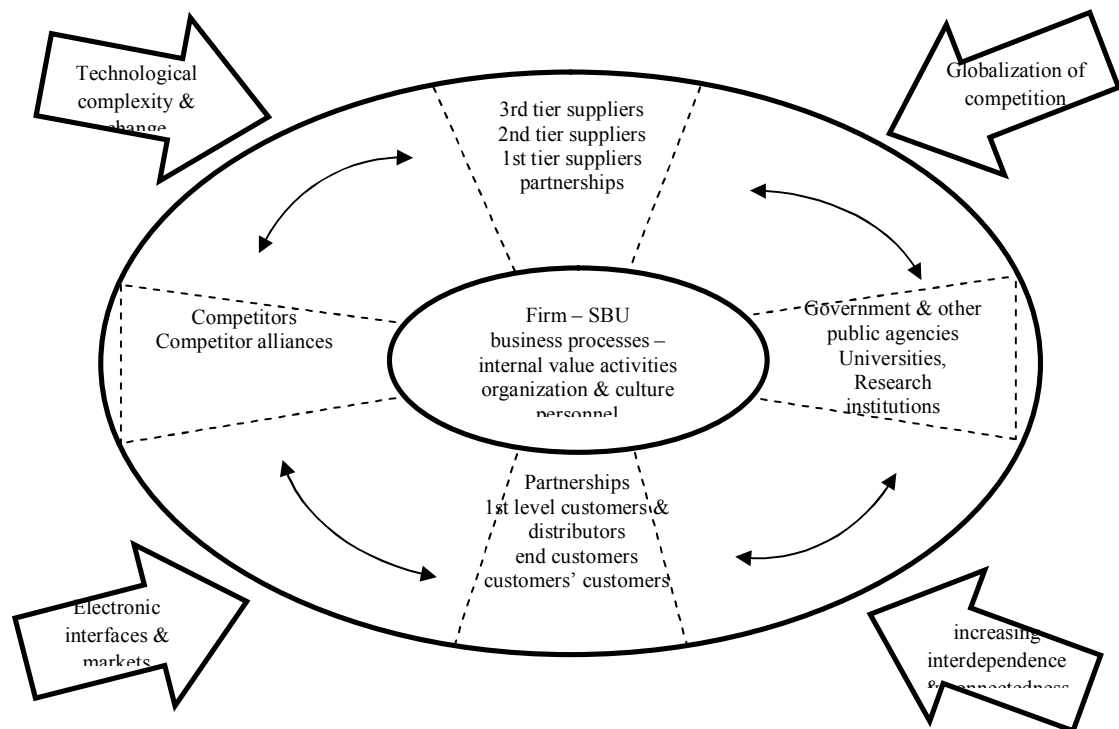
Network is defined as “a structure where a number of nodes are related to each other by specific threads” (Hakansson and Ford, 2002: 133). These nodes are individually significant actors but are dependent on each other and thus they interact through these threads. This interdependency is due to the imbalanced distribution of resources and skills among the nodes of a certain network (Mouzas and Ford, 2009).

This network concept is not formed upon a single company and the companies that this single company knows of or interacts with. The network does not have a single hub, it is not owned by any of the companies located in it and it has no clear and definite boundaries (Ford et al., 2002). Today business is carried out by a wide and complex network of organizations with different strategies and management models (Ford and Hakansson, 2006) where this network constitutes a special form of aggregate organization above all the organizations that are forming itself (Hakansson and Ford, 2002).

There are many different drivers of the continuously evolving nature of business networks ranging from the technological developments to rate of outsourcing. The increased requirement of intense technology usage in business processes, reinforces companies to withdraw from the production of these technologies while still depending on them. The complexity of business problems

require complex offerings in return that cause the interrelated parties to engage in closer relationships. The smooth communication opportunities between long distances, carry these interrelated complex networks to an international platform (Ford and Hakansson, 2006). The members of these networks are not performing their traditional roles any more. None of the manufacturers in a vertical channel relationship is the only manufacturer of a product. The high ratio of externalization of internal activities to complex supply networks where each member specializes in certain activities, results in large networks providing better products and services in shorter lead times (Möller and Halinen, 1999).

**Figure 3.** Business Relationships and Networks – A Focal Firm Perspective

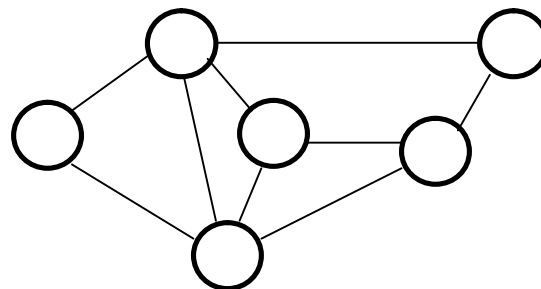


Source: Möller and Halinen, 1999: 415

Several vertical and horizontal relationships that are possibly prevail in any business network are shown on Figure 3. The drivers effecting the structure, size and the members of this network are shown by incoming arrows from the network environment. The central part here represents a single company or a specific business unit of a single company surrounded by tiers of suppliers and customers vertically and supported by horizontal alliances or cooperations with competitors,

governmental agencies or research institutions. However, this is not the network of this focal company actually. Any firm standing at any specific point on this network, can and should visualize the network from its own perspective in order to understand its own network position and the importance of its relations embedded in various networks. A network view adopted by the member companies enable them to foresee and understand the consequences of certain actions within the network and the mutual effects that change the structure of the network and the positions of its members (Ford and McDowell, 1999). In order to understand any single relationship, a company has to refer to the wider network (Hakansson and Ford, 2002). For example, if a logistics network is considered for analysis, then all companies that are dealing with that specific type of logistics service should be subject to analysis no matter if they have current relationships among themselves or not; they are still in the network (Ford et al., 2002).

**Figure 4.** A Basic Representation of Nodes and Links System



The nodes and links system shown in Figure 4 resembles to the models drawn for the representation of supply chains. Similar with supply chains, but larger than them in context, business networks are formed of nodes and threads connecting the nodes. The interaction between the nodes is realized through these threads and all of these threads are heavy with their content. The content they have is realized and enlarged by the investments made by both of the nodes on themselves, on each other or on the thread. The opportunities and the limitations valid for these nodes rely in the content of the threads tying them. Nevertheless, it is not only the nodes that create the threads. In other words, it is not only the businesses that develop the relationships within a network. The relationships also develop the nodes that they

link. So none of them can be considered as the control center of the interaction. Although the tendency of organizations is to control the networks that they operate in, this control will decrease the innovativeness and operational effectiveness of the network as a whole (Hakansson and Ford, 2002).

So network theory is part of a complexity theory where these nodes and threads are formed up of a various number of actors like intermediaries, employees, media, neighbours, public organizations' infrastructural elements like the roads, telecommunication cables and many more. In this kind of an environment, it is unlikely to develop a single form of reality. Instead, there are unlimited number of unique situations dependent on the structure and conditions of networks (Gummesson, 2008).

There are some efforts for classifying business networks, however the networks that IMP deals with are not bound with an absolute and objective type of a network (Ford et al., 2002). Achrol and Kotler (1999) propose four different types of networks which are (1) internal market networks, (2) vertical market networks, (3) intermarket networks, (4) opportunity networks. Internal markets refer to the dissemination of activities to the different units in a firm and organizing these units to work as a network for the achievement of corporate aims. Conventional set of suppliers, distributors and customers located around a focal organization constitute the vertical market networks. Intermarket networks contain organizations belonging to more than a single industry that aim to achieve synergy by cooperating around a single organization which is generally chosen among the financial institutions in the network (Hult, 2011). Japanese Keiretsu structures are an example for these. Opportunity networks are dynamic inter-organizational networks where the members take part in special customer projects which are developed depending on the market demand. These networks are generally formed around a focal marketing organization (Gaur et al., 2005).

Another classification of networks has been carried with reference to the goals that networks aim to achieve (de Man, 2004; cited by Möller and Rajala, 2007). These types of networks are:

- Quasi-integration networks: mainly horizontal networks aiming to achieve competitive advantage by utilizing network members' resources
- Supply (and demand or customer) oriented networks:
  - Vertical networks: sequential networks aiming efficiency
  - Solution networks: horizontal or diagonal partners aiming to solve customer-specific problems.
- Technology-oriented networks:
  - R&D networks: aiming to develop new technologies
  - Standardization networks: aiming to align a dominant technology among the partners.

Piercy and Cravens (1995) offer the term “hollow network” for networks with a core company that is dependent majorly on others for all its business activity and is designed to be agile when there is a need to change the resources that are needed. Möller and Rajala (2007) classifies business networks on a continuum starting from high-level of determination in the members, activities and values of the networks and ending at the low-level of determination in these factors. The seven business network types are located under three main headings of current business nets, business renewal nets and emerging business nets.

So with the notions of nodes and threads approach and the interaction perspective of business networks, it is possible to conclude that the development of network relationship is due to the interdependence of companies. This interdependence results from the resources that the members of a specific network lack and seek in other members. Turnbull et al. (1996) summarizes these resources as the financial resources, which are obvious in their type, the company's network position and its technologies. The company's network position is related with its proximity to markets, its relationships, its ability to collect essential market information and has a dynamic structure. The company's technologies are all the skills and capabilities that the company has in its products, processes and marketing relationships. These resources, if they are worth something for another member in the network, provide the value transfer between members through interaction.

As a result, the interconnection between, relationship marketing and industrial network theory is in the two term's nature. A network is formed of relationships but a relationship is unable to exist without the network operating in the market. So both the nodes and the threads are interdependent on each other.

Services, as well, form business networks in order to solve complex customer problems. These service networks utilize proximity to the customers and efficient back office operations advantages by their unique organizational design advantage (Gaur et al., 2005). In this type of organizational design, the parent company of the service network initiates guidance, innovation, performance measures, expertise and service support (Chandler, 1991).

As a combination of above listed network types, where mutual interaction and long term relationships are highly essential, logistics centers constitute an example for industrial networks. Logistics centers are organizations that arose due to the needs of today's markets which are in search of alternative methods to facilitate the transformation, transportation and storage of globally sourced, produced and marketed products. Related with these characteristics, they are composed of many individual entities which are either vertically or horizontally linked to each other. The combination of these entities is a complex network which is called the logistics center organization so an analysis on logistics centers with a customer focus should take industrial network approach into consideration.

### **1.3. CONCLUDING RELATIONSHIP MARKETING AND INDUSTRIAL NETWORK THEORY: INTEGRATION WITH LOGISTICS CENTERS**

Relationship marketing theory states that the major focus of exchange in marketing should be the relationships between the parties instead of single transactions (Webster, 1992). The beginning of these relationships is the moment when the seller and the buyer meets to evaluate a market offering. This is the establishment part of a relationship. However, the definition of relationship marketing states that not only establishment but also the maintenance and enhancement of mutually satisfactory relationships are required in order to satisfy the objectives of all parties involved in a transaction. This is suggested to be done by

fulfillment of promises (Grönroos, 1994a). So the promises given to the buyer and the fulfillment of them according to customer expectations is an essential point for success.

Another important proposition of relationship marketing is its proponents' objections to marketing management school's role definition. Relationship marketing scholars defend that buyer is not a passive figure in marketing transactions (Grönroos, 1994a). Opposingly, buyers, suppliers and all other parties related in an exchange are supposed to be involved in the marketing programs of companies (Shani and Chalasani, 1991). In the meantime, the marketing offerings of these companies evolve with the impact of new economy. Today's market offerings are combined products and services that offer value through system-wide solutions (Shapiro and Posner, 1979). This results with an increase in number of parties involved in a value-delivery action.

Relationship marketing theory was conceived to be a new approach for consumer markets but it was actually always there in industrial markets where a long lasting relationship is highly required and common between the buyer and the seller (Christy et al., 1996). The network approach to industrial markets which has been developed by the IMP Group in Scandinavia, also has its roots in relationships between the market entities (Mattson, 1997). This network approach perceives the firm as an entity which is covered by many actors, resources and activities instead of an isolated organization (Möller and Halinen, 1999). There is not a single hub in this network with comparatively high importance and the boundaries of the network constantly change due to its dynamic nature (Ford et al., 2002). This network is created by the nodes in it which develop relationships bonding them. But also, the relationships develop businesses that interlink within a network so this is an interdependent process (Hakansson and Ford, 2002).

In a logistics center, different parties that deliver value through the performance of different logistics activities are located. These parties are the industrial customers of the logistics center organization that rent the facilities they develop and use the services they produce. An investment in this facility is a decision that has long term impacts and thus the relationships between the provider of the facilities and the service and the buyer should last long. The market offering is a

combined product that is very tangible with the buildings, handling equipment, transportation infrastructure and very intangible with the maintenance, consulting, information and communication technology (ICT) services or synergy opportunities inside.

Due to its nature, logistics centers have a dual structure. The high infrastructure development part attracts public attention due to high state investment required. Also such a facility is supposed to facilitate the economic development of its periphery through increased employment and throughput so public authorities are keen on these investments. The effective management of possible synergies inside the facility, cost reduction and revenue enhancement opportunities, on the other hand, attract private sector attraction.

Taking all these characteristics under consideration, logistics centers are approached by public policy, transportation policy, transportation efficiency, facility development lenses. However, they are hardly ever evaluated with a marketing approach. That's why there are idle examples all over the world where facilities are developed with whim, hoping that they would repay all the investment back soon. However, due to the lack of a marketing lense, the authorities can't see the over-capacity issues and cannibalization potentials of alike facilities in close territories. These could have been avoided if the potential customers of these centers were involved in the market offering's design process. In order to do this, their potential usage of such a facility and their expectations from there should be explored.

Again, due to the characteristics of the logistics center organization, this entity can be viewed as an industrial network where different nodes are developing links with each other at the same geographically concentrated area. There is not single hub in the organization, although there is a single managing party. The aim is to develop synergy through the interaction between the nodes in the network. They act like an intermarket network (Hult, 2011) where enterprises from different industries (mainly logistics though) come together around a managing organization. They can carry the characteristics of quasi-integration networks, supply (and demand or consumer) oriented networks or technology-oriented networks (de Man, 2004; cited by Möller and Rajala, 2007). They provide industrial services to their residents like maintenance or repair, real estate development, ICT or consulting and they

facilitate the smooth transaction of freight through the help of the network that they operate together with so they also resemble to service networks as defined by Chandler (1991).

Sheth and Parvatiyar (1995) states that the main axioms of relationship marketing theory are the mutual interdependence between the market actors and mutual cooperation among them. Logistics centers are entities that aim to provide the organization that would facilitate the mutual cooperation between the mutually interdependent parties that produce logistics services or support this production. Gummesson (1994a: 5) define relationship marketing as “marketing seen as relationships, networks and interaction” which is similar to the situation prevalent in a logistics center. So these organizations are required to be analyzed with a relationship marketing focus. An industrial market approach is also a required framework depending on its main themes of interaction, relationship and network which are the tools that the logistics center residents should use in order to achieve their aims.

As a result of this discussion, an effort to link the basic principles of these two marketing theories with the research interest of this study is represented on Table 2. This theoretical effort will be enhanced with further input from cluster theory, industrial services theory and service dominant logic in the forthcoming sections.

**Table 2.** Marketing Theories and Propositions

| <b>Theory</b>                        | <b>Primary Scholars</b>                                  | <b>Focus</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Propositions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Relationship Marketing Theory</b> | Grönroos, 1994a;<br>Gummesson, 1994b                     | <ul style="list-style-type: none"> <li>-Buyer is an active party in the marketing transaction</li> <li>-The main focus of exchange is the relationship between buyer and the seller.</li> <li>-Marketing should manage this relationship by establishing long term and mutually beneficial relationships with the customers in order to satisfy their requirements.</li> <li>-Buyers should be involved in developing the market offering and marketing program for it.</li> </ul> | <ul style="list-style-type: none"> <li>-The buyer of a logistics center service, the logistics service provider (LSP) is the active party in the industrial service buying process from the logistics center.</li> <li>-The logistics center organization should establish long term and mutually beneficial relationships with the LSPs to satisfy their requirements.</li> <li>-The logistics center organization can initiate these long term relationships in the industrial service design phase by exploring LSPs' expectations from such a facility.</li> </ul> |
| <b>Industrial Network Approach</b>   | Ford and Hakansson, 2006 and the Scandinavian IMP School | <ul style="list-style-type: none"> <li>-Business is carried out by a complex network of organizations with different strategies and management models</li> <li>-Marketing should be approached with interaction, relationship and network themes.</li> </ul>                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>-The business within a logistics center is carried out by a complex network of different enterprises related with the logistics industry.</li> <li>-The LSPs and the logistics center organization are both active in developing and designing transactions between them.</li> <li>-There is a long lasting relationship between the LSP and the logistics center organization.</li> <li>-The LSPs and the logistics center organization both are surrounded by actors, resources and activities.</li> </ul>                    |

The study adopts a marketing point of view to logistics centers as a form of logistics clusters and defines them as industrial service producers. Throughout this process, the study borrows relationship marketing's intensity to perceive the buyer as an active party in the market transaction and proposes that the LSPs are active actors in their organization service buying process from a logistics center. They should be involved in the market offering's design process.

The study also perceives the logistics center as an industrial network composed of internal and external customers, suppliers and all the related industries and institutions with the facility. This industrial network solves the complex problems of its customers and requires mutual interaction and relationship management. The LSPs and the logistics center organization are both active in designing, initiating and developing the transactions between them. There is a long lasting relationship between the LSP and the logistics center organization which takes place in a complex dynamic network.

These theories are providing the basis for the research interest and they validate the requirement that the buyer, the LSP in this case, should be involved in the industrial service design process of a logistics center. In addition, they defend that a logistics center is a complex network composed of different but related companies. The aim of this study is to offer the industrial service design in a logistics center deriving from customer requirements. However, in order to achieve this aim, initially the logistics center's market offering needs to be defined. In this case, it is accepted to be a set of industrial services. So before proceeding to the entity itself, first an effort is made towards the conceptualization of industrial services and their buying processes.

## **SECTION II**

### **INDUSTRIAL MARKETS, INDUSTRIAL SERVICES AND ORGANIZATIONAL BUYING PROCESS: A THEORETICAL REVIEW**

Having explored the different marketing theories and relating them with the logistics service concept, this section makes an effort on supporting logistics center as an industrial service producing entity with the help of related theories. In order to achieve this aim, initially the service paradigm and goods versus services debates are reviewed. After that, the related marketing schools are explored. Commodity school of thought which is mainly criticized to focus on tangible goods is used to explore the goods dominant logic. Service dominant logic is explored in order to review the existing efforts to differentiate goods and services. The two dichotomies, goods vs services plus consumer goods vs industrial goods are explored for further analysis of the hybrid and complex nature of industrial services.

Following them, the concept of logistics centers are explored in depth in order to understand the market offering characteristics of this entity. The market offering characteristics are the essential inputs for an industrial service design effort and the methodology of this specific study.

#### **2.1. SERVICE PARADIGM AND ITS IMPORTANCE**

Service paradigm captures a strong position in today's marketing and economy literature and practice. As countries, especially the developed countries move towards a service based economy (Wöfl, 2005) due to their higher costs on manufacturing industries (Neely, 2007), management and marketing of services have become very important issues for all businesses. Different approaches prevail for classification efforts of what a service is and what kind of characteristics should a marketing offering have in order to be called a service.

Understanding the service concept and its specific properties, is an essential capability for businesses whom strive for innovation in their market offerings (Kindström, 2010) in today's highly competitive, global marketplace. It also constitutes an important know-how for new service development (NSD) initiatives

(Goldstein et al., 2002). An extensive knowledge on the service concept, a deep understanding of current market demand and a successful forecast on future market demand would act as valuable inputs to a NSD process.

As a complex and high variety service, logistics, is being announced to have a reasonable share in majority of the countries' economic activities. In 2009, logistics market revenues represented 6,2 % of India's GDP (Frost & Sullivan, 2010); 6,7 % of China's GDP and these countries are the fastest developing economies in the world. Logistics costs as a percentage of GDP, another important indicator, constitute 8,2 % of EU's GDP, 9,4 % of USA's GDP, 13 % of India's and 18 % of China's GDP (KPMG, 2010). So it is very important for this rapidly developing industry in the leading economies of the world, to comprehend its service components, its customers' expectations and design the service offerings accordingly.

## **2.2. GOODS VERSUS SERVICES PARADIGM**

There is a clear distinction between products and services in the economy which is based on the nature of the work performed in specific production activities (Jansson, 2009) and thus is used for determining the percentage of GDP arising from services sector and the amount of employment in the services sector. The same distinction also prevails in marketing literature and practice and it is specified depending on market offerings' characteristics and their use by the consumers (Araujo and Spring, 2006). These distinctions are required in order to determine how to manage service businesses and how to market services for ultimate competitive advantage and customer satisfaction.

A product is generally seen as a physical "thing" which is easily tradable as it is standardized and scripted (Araujo and Spring, 2006). However, services are accepted as a kind of deviation from the normality of production (Spring and Araujo, 2009) and that's why they deserve to be treated specially (Bowen and Ford, 2002). The traditional schools in marketing focus on the transaction and exchange function of marketing. So as this exchange takes place between producers and consumers, the important thing to manage this process is to focus on the objects of transaction which

are the products (Sheth et al., 1988). By classifying the similar products together in one category, the marketers are able to use the same marketing procedures and techniques to these groups of products. These classification efforts have been developed mainly by scholars from commodity school of thought and their focus was mainly on physical products.

Actually the initial development of service concept, its production and management arose during the 1970s with some early doctoral dissertations and books. The progress continued simultaneously in America by Lovelock's (1984; 1988) text books and in Europe by many different scholars (see Grönroos, 1994a for a detailed list). The so called IHIP (intangibility, heterogeneity, inseparability, perishability) characteristics of services, are accepted to be the reason that marketing of services deserve a different approach when compared to marketing of physical goods (Fisk et al., 1993).

Another duality between goods and services arise due to the reality that products are pre-produced and are waiting for the customers to choose them. Nevertheless, services have a production process in which the customer takes a role and joins in (Grönroos, 1998). However, Araujo and Spring (2006) gives several different examples where a physical product can be produced together with the customer's direct interaction with production resources with the aim of customization. Or a service offering can be standardized and mass marketed for every customer who requests a similar solution.

There are other oppositions against the duality created between goods and services. Levitt (1981) introduced his view that the important thing is not the distinction between goods and services but it is the distinction between the marketing of tangibles and intangibles. So the strategy should be built upon the tangibilization of a product or a service whose benefit is not able to be understood before it is used by a final consumer or intangibilization of a physical product or a service in order to emphasize the benefits of its use. In addition to that, there are many differences not only between goods and services but also among services (Zeithaml et al., 1985).

All these duality discussions and alternative evaluations of the services concept have evolved together with the "new economy" that surrounded the business world from all aspects. The two main drivers behind the new economy are

globalization and developments in ICT(Pohjola, 2002a; 2002b). The new economy and its drivers provided a fundamental change in the characteristics of goods and services and redefined them as knowledge products (Perrons, 2005). The pioneer industries of the old economy have retracted and left their places to new services industries (Partridge and Rickman, 2002). These developments in economy and nature of business have influenced marketing as well and resulted in the birth of new schools of marketing. An overview of marketing theory starting from the traditional schools of marketing towards the recent schools, provides a comprehensive picture of goods versus services duality and its implications in marketing science.

### **2.2.1. Commodity School of Thought**

Among the traditional schools of marketing, functional and institutional schools have different scopes for building their theories. The former is mainly concerned about the functions of marketing and categorized these different functions. The latter mainly works on the institutions required for transactions and on definitions of the middlemen (Shaw and Jones, 2005). The commodity school of thought, on the other hand, focuses entirely on the object of transaction, which is the physical product indeed (Sheth et al., 1988). So the distinction between goods and services and the concentration of marketing on the physical products goes back to the traditional schools.

The rationale behind commodity school of thought was to classify products in homogeneous categories and create some recipes for their marketing processes (Sheth et al., 1988). By having such categories, it was much more systematic and safe to choose the store that the product will be exhibited, or the price that the product should be labeled, or the communication that the product requires to be bought. The pioneer scholar in this school is Charles Parlin who made an initial classification for products in 1912 (Gardner, 1945). His three categories of convenience goods, emergency goods and shopping lines have been improved by Melvin Copeland in 1923 by the introduction of convenience goods, shopping goods and specialty goods categories among consumer products (Copeland, 1923).

Classification of products depending on their physical characteristics and their production characteristics was another attempt (Rhoades, 1927; cited by Sheth et al., 1988) which may be considered to have similarities with the distinction of services from the products market with their own characteristics. Aspinwall (1958; cited by Shaw and Jones, 2005), on the other hand, developed a color scale which classified goods depending on five criteria: replacement rate, gross margin, adjustment, time of consumption and searching time. The adjustment criteria in his categorization, constitutes a proof for the recognition of the accompanying services that a physical product needs.

This classification done by the commodity school of marketing (Sheth et al., 1988) has proved to be a robust approach as even today, majority of marketing books use the convenience goods, shopping goods and specialty goods categories. Some later efforts done by Holbrook and Howard (1977; cited by Sheth et al., 1988) and Enis and Roering (1980; cited by Sheth et al., 1988) developed a fourth category of preference goods which resulted due to the high or low customer involvement throughout a purchase. These scholars introduced their frameworks to enable the act of choosing the class of a certain product through specific dimensions.

Although Murphy and Enis (1986) developed Copeland's classification by using risk and effort dimensions and claimed that their classification is applicable to all marketing transactions including services, the commodity school of thought is mainly criticized for being concentrated only on consumer goods (Sheth et al., 1988). Nevertheless Duncan (1920; cited by Shaw and Jones, 2005) is one of the scholars who mentioned that the classification of commodities could be applied to all types of goods no matter if they are material goods or services. As an effort for classifying services, Lovelock (1983) used the perspective of commodity school and provided a new point of view for the marketing of services. So the notion of services is generally not prevalent in this early school of marketing neither in terms of a distinct product nor in terms of a sub-area. The traditional focus regarding the goods versus services debate is extensively concentrated on distinguishing goods and services and creating the marketing program that was effective for the correct product form (Winsor et al., 2004). It was only 1970s that services and the overall market offering was explored more in depth.

### **2.2.2 Service-Dominant Logic**

The reason that the title of this section has been chosen from Vargo and Lusch's (2004a) debated article is that this name fits directly with the services concept discussions going on in marketing literature. The scholars that are in search for the basis of services concept, defend that services are the main products which are being exchanged and all physical products are just a tool to deliver the service facilitating itself. The service marketing literature evolved from the differences between goods and services and marketing of services as a special case, to a mentality of new services marketing (Gummesson, 2010).

According to Vargo (2007), as a derived discipline from economics, marketing flourished from the goods-centered paradigm which was a necessity of positive science that rested upon Newtonian-mechanics depending on a central matter with embedded properties. The physical product was the matter and the utility it creates was the properties embedded in it. This mentality in marketing science was seen as a restricted perspective to utility creation process and was called as goods-dominant logic (Vargo and Lusch, 2004a).

Services were always there in the market but due to the above mentioned approach in theory building, how to market services was a secondary issue in marketing theory which gained attention after 1970s. Nevertheless, as Vargo (2007) states, by then, the service practitioners had already found their marketing methods for services they offered during daily transactions. The first attempts to build up services marketing theory, was initiated from the effort of specifying certain characteristics of services that distinguish them from goods and to develop marketing strategies prevalent for these two different product forms (Winsor et al., 2004). These characteristics of services are listed as (Zeithaml et al., 1985; Kotler and Armstrong, 2008; Lovelock and Wirtz, 2011):

a-Intangibility: Lack of a tangible good that is to be exchanged.

b-Heterogeneity: Variability of the service performance among different service providers and in time.

c-Inseparability: The integrated nature of the exchange process where the customer takes an active role together with the service provider.

d-Perishability: Inability of the services to be stockpiled for later use.

The services are generally defined after a firm definition of what goods are. Goods are: “tangible economic products that are capable of being seen and touched and may or may not be tasted, heard, or smelled” (Rathmell, 1966: 32) and services are what goods are not (Rathmell, 1966) in general. Gadrey (2000) classifies the efforts to define services into three main approaches. The first approach states that services are both immaterial and perish at the moment of production. The second approach is the interactionist approach stating that services are co-produced with the seller and the customer both cooperating in the process. The third approach defines services with their inability to be stored or transported. A widely accepted definition of services is made by Hill (1977: 331) as *"a change in the condition of a person, or a good belonging to some economic unit, which is brought about as a result of the activity of some other economic unit, with the prior agreement of the former person or economic unit."*

However, many debates are held upon these characteristics and how they no longer reflect the reality about the duality. Winsor et al. (2004) give examples from book or magazine publishing industry and its digital version, i.e. multimedia industry and its digital offerings in order to prove that the intangibility criteria is not so solid to be used for differentiating a service from a physical good. Gummesson (1991a) takes a service quality perspective and differentiates a service and a good in terms of the customer's involvement period in the product or service delivery process. Even though the four IHIP characteristics are generally adopted in nearly every platform without questioning the underlying logic (Grönroos, 2000); the “myth” about service characteristics is challenged by proving some opposite cases. When a service has certain tangible results with long lasting (and thus stocked) benefits or when a product is customized (and thus heterogeneous in nature) and the customer is involved in the basic value embedded in the product, the four “myths” lose their validity (Vargo and Lusch, 2004b).

These so called IHIP characteristics are also criticized to be goods and manufacturing oriented (Vargo and Lusch, 2004b). However, services, with a different nature, can not be just a label under the broad umbrella of products and they can not be treated with physical products' marketing tools. They should be managed

from a totally opposite view when compared to traditional product practices in order to sustain (Shostack, 1977).

Throughout these debates, the services marketing literature evolved towards the service-dominant logic approach. This approach also have proponents and opponents and is receiving certain attention. The earlier efforts to draw a map of goods and services depending on their tangibility potentials, resulted in continuums showing pure services at one hand and pure goods on the other hand (Rathmell, 1966; Shostack, 1977). However, together with the developments in technology and changes in customer demand, different combinations of goods and services emerged as new market offerings. These offerings are not purely services and are not purely products even though they may be involved in a single industry for the calculation of macro economic indicators by nations. This new perspective taking a services point of view and challenging the dominance of physical goods in marketing appeared together with the rise of service economy and shift of employment towards services industry.

Rathmell (1966) makes a distinction between goods and services by stating that goods are generally “nouns” and services are generally “verbs”. Verbs instate an action that changes the state of something – mainly nouns. The service-dominant logic depends on this definition of services. According to this view, services are *the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself* (Vargo and Lusch, 2004a: 2). These special knowledge and skills use goods as means to deliver value to customers.

Value is not the performance indicators determined by the supplier of a good or service (Gummesson, 2010), it is rather a concept defined from the perspective of the customer and is measured in terms of the outputs of an offering delivery process (Porter, 2008). Service-dominant logic defies the separation principle of physical products which is valid in goods-dominant logic and which states that goods are produced ahead of consumption and consumer is not included in the production phase. Service centered view states that value is co-created with the customer, so a supplier offers a value proposition to the market but the value that it intends to create is actualized by the customer at the end (Vargo and Lusch, 2004a).

The basic premises of service-dominant logic have been summarized by Vargo et al. (2008) and are developed by Vargo and Lusch (2008a):

1. Service is the fundamental basis of exchange.
2. Indirect exchange masks the fundamental basis of exchange.
3. Goods are a distribution mechanism for service provision.
4. Operant resources are the fundamental source of competitive advantage.
5. All economies are service economies.
6. The customer is always a co-creator of value.
7. The enterprise can not deliver value, but only offer value propositions.
8. A service-centered view is inherently customer oriented and relational.
9. All social and economic actors are resource integrators.
10. Value is uniquely and phenomenologically determined by the beneficiary.

The rationale behind the singular word “service” is the intention of delimiting the phrase as the *process* of doing something. So service is always the subject of exchange in the market; independent of whether it is delivered through services or goods (Vargo and Lusch, 2008b). The direct exchange is not as visible as it was in the past due to the complex network structure in global value chains (Gummesson, 2010). The resources are divided into two main headings which are operand resources and operant resources. The former represents the tangible and diminishing physical resources like raw materials or other components and the latter representing the skills, know-how and all the other dynamic resources (Constantin and Lusch, 1994; cited by Lusch, 2006). All actors in the markets are acting as resource integrators whom are using these operant resources to actualize value either through pure services provision or through physical goods.

As this logic continues to evolve (Lusch and Vargo, 2006), there will, probably, be new premises or revisions to the old ones. On the other hand, this new perspective also has some opponents. The initial objection is on the definition of a service in terms of an application and this definition is criticized for excluding the

functions that a service realizes (O'Shaugnessy and O'Shaugnessy, 2009). They also criticize service-dominant logic for being oriented towards technology, i.e. how to market market offerings; rather than trying to develop an explanatory theory (O'Shaugnessy and O'Shaugnessy, 2009).

Despite the criticisms, the enlarging share of services both in developed economies (Neely, 2007) and in business firms of whom operate both in services and manufacturing sectors (Jacob and Ulaga, 2008) indicate that service concepts will keep being studied both by practitioners and scholars. As Araujo and Spring (2006) state, today's companies are both product and service based and these services interact within firms, markets and supply networks. They cite from Davies (2003) that due to the rate of outsourcing and the vertical disintegration through conventional supply chains a new type of organization seems to emerge which is called the systems integrator. This systems integrator, designs a system and applies certain capabilities to smooth the transactions between the value providers that take a role in the system. The logistics center concept, which is focal system in this research, tries to integrate the dispersed logistics activities in a cluster and build up a smoothly operating node located on local or global supply chains. The cluster includes many goods which are *very* tangible like railroad infrastructures, large warehouses or giant cranes. However, what the center produces is a service offering that changes the spatial or existing state of material goods that are subject to trade. So the service definition, service conceptualization and service development process are very essential in terms of creating a tradable and visualized industrial service in these centers.

### **2.2.3. Consumer Services versus Industrial Services**

The overall business markets are generally divided into three big segments depending on the certain characteristics of exchange parties: consumer markets, industrial markets and public markets (Kotler, 2000). Public markets are governmental agencies which are either the seller or the buyer of certain goods and services for supporting public funds and for enabling public services. Their prior aim

is to serve to the community so profit objective is not the initial cause for the enterprises facilitating in these markets.

Consumer markets and industrial markets on the other hand, divide the large local and global markets into two large segments. The first one is the consumer markets where the goods and services for the consumption of final consumers are being bought and sold. The second one is the industrial markets where the transaction takes place between organizations and for the purpose of further production of goods and services that are sold, rented or supplied to others (Kotler and Armstrong, 2008).

According to Webster (1991), the industrial markets can be distinguished from consumer markets mainly by the characteristics of the customers rather than the nature of the product itself. He suggests three main customer groups in industrial markets: industrial, institutional and governmental. Industrial customers are the manufacturing or processing firms or firms that purchase products in order to distribute or resell. Health care or educational institutions are among institutional customers. Governmental customers consist of buyers at state, regional or national levels.

Another classification is done by Marrian (1968) depending on the types of goods that are subject to transaction. According to this classification, goods purchased to equip organizations for their production or distribution purposes are called industrial equipment. Goods purchased in order to be used in further production of other goods and services are called industrial materials. The goods purchased again for the purpose of further production but are consumed during the production process as an assisting material are called industrial supplies. The services purchased to facilitate the production of goods and services are called industrial services. Logistics, together with its all separate activities, takes place under this class.

So whether the object of transaction is a good or a service, the market that they are traded differs depending on the certain characteristics of the exchange parties. The markets where goods and services are transacted for final consumption are called consumer markets. The markets where they are transacted for facilitating or supporting production, for rent or resale are called industrial markets.

Webster (1978) states that industrial marketing is generally less marketing oriented than consumer marketing due to certain differences among them. These are:

1- Marketing in industrial companies is highly dependent on other business functions and any change in the industrial product's marketing strategy is closely connected to the overall corporate strategy

2- As the industrial products are highly technical and complex, the focus generally is given to the product itself instead of the marketing process.

3- There is a high degree of buyer-seller interdependence which the relationship marketing theory also supports.

4- The organizational buying process is much more complex when compared with consumer buying process.

Starting with the type of exchange parties and the purpose of the exchange, there are other properties of industrial markets which distinguishes them like fewer number of buyers, close supplier-customer relationships, multiple influences on buying process, derived demand by final consumption markets, reciprocity principle and geographical proximity (Kotler and Armstrong, 2008).

These differences are widely accepted in major marketing books and articles but are also criticized for not being based on theory and for confusing the strategy building process in marketing (Fern and Brown, 1984).

The vast majority of research about services marketing focuses on consumer services but industrial services have different characteristics when compared with consumer services. So keeping the differences between consumer markets versus industrial markets and goods versus services in mind, industrial services can not be marketed with either industrial goods marketing strategies or consumer services marketing strategies (Cooper and Jackson, 1988).

As mentioned in the previous section, the dominant schools of marketing like the marketing management school are blamed for concentrating largely on mass marketed consumer goods and thus consumer markets. The realm of industrial markets have been initially recognized by Scandinavian school (Baker, 2010). This distinction, combined with goods versus services distinction results in four different types of markets: consumer goods, consumer services, industrial goods and industrial

services. As the focus of this study is the industrial services, they will be explored in more depth through a detailed classification.

#### **2.2.3.1. Industrial Services Classification**

With the increasing competitive pressures and changing business structures around the world, industrial manufacturers tend to complement their offerings of traditional business products with business services in the recent years (Jacob and Ulaga, 2008). These complex offerings are compatible with the service dominant logic in marketing (Vargo and Lusch, 2004a) as they are differentiated by the skills and capabilities a company can offer which constitute the operant resources a business possesses.

As mentioned in previous sections, services have different characteristics than physical goods and thus they are marketed in a different way. Industrial markets have specific differences when compared with consumer markets as well. When the existing services marketing literature is considered, it is likely to say that the large focus is on consumer services. Morris and Davis (1992) and Moore and Schlegelmilch (1994) attract the attention to the under development of literature on industrial services. However, the marketing methods of either industrial goods or consumer services are not applicable to industrial services (Cooper and Jackson, 1988). They have to be classified and marketed depending on their characteristics.

There are various approaches to the classification and typology of industrial services. Classification of services for industrial customers would avail significant assistance in managing services marketing (Lovelock, 1983). Systematic classification of industrial services also aid managers in accurate positioning of the industrial service offering (Boyt and Harvey, 1997).

The classification of services also is helpful in segmentation process of industrial customers. Although there are some macro approaches in business markets for segmentation depending on the company size, geographical location, industry type or purchasing approaches (Kotler and Armstrong, 2008), there is also a need for microsegmentation (Wind and Cardozo, 1974) or a nested approach to segmentation (Bonoma and Shapiro, 1984) in order to configure a customer driven strategy. These

approaches take industrial buyer behavior, decision making units and customer requirements as the basis for business market segmentation.

### ***Classification of Services in General***

There are several efforts for classifying services in general manner. Judd (1964) makes a classification depending on their accompany with goods and the ownership of goods. This classification is among rented goods services, owned goods services and non-goods services. Another classification approach depending on the proportion of goods accompanied by the service offering is done by Shostack (1977). Thomas (1978) makes a classification depending on the service-provider: equipment-based services and people-based services. Kotler and Armstrong (2008) synthesizes various approaches and offers different classifications depending on if a service is:

- People-based or equipment-based
- If it requires client's presence
- If the service satisfies personal needs or business needs
- If it is a public or private, for-profit or not-for-profit service

A detailed schematic representation of existing studies on services classification is developed by Lovelock (1983:11). Lovelock et al. (1999: 31) offers seven different dimensions to classify services:

- Degree of tangibility of service processes
- Who or what is the direct recipient of the service processes ?
- The place and time of service delivery
- Customization versus standardization
- Nature of relationship with customers
- Extent to which demand and supply are in balance
- Extent to which facilities, equipment and people are part of the service experience

### *Supplier-sided Classification Efforts for Industrial Services*

Despite these attempts done for classifying services in general, the classification of industrial services did not receive much attention from scholars as of 1997 (Boyt and Harvey, 1997: 294). An early effort for this purpose presents six main dimensions differentiating industrial services under three main headings (Boyt and Harvey, 1997). Table 3 shows this classification.

**Table 3.** Industrial Service Classification

| Service Characteristics | Service Categories |                      |                   |
|-------------------------|--------------------|----------------------|-------------------|
|                         | Elementary Service | Intermediate Service | Intricate Service |
| Replacement Rate        | High               | Medium               | Low               |
| Essentiality            | Low                | Medium               | High              |
| Complexity              | Low                | Medium               | High              |
| Personal Delivery       | Low                | Medium               | High              |
| Credence Properties     | Low                | Medium               | High              |

Source: Boyt and Harvey, 1997: 295

According to this classification replacement rate refers to the frequency of the service to be rebought by the customer. Essentiality is about the importance of the service for the operation of a certain product. Complexity depends on the technical difficulty and expertise required for the delivery of the service. Personal delivery states if the service has to be delivered through a person or an equipment. Credence properties are properties about the difficulty of service performance evaluation by the customer. An additional aspect is the risk factor associated with a possible service failure (Boyt and Harvey, 1997).

After this date, some other scholarly initiatives for industrial service classification followed. Fitzsimmons et al. (1998) took an organizational buying perspective in offering an industrial service taxonomy. Their perspective states that once a purchasing manager in an organization knows (1) the focus of the organizational service that is going to be bought and (2) the importance of this service to the company, then they will be able to manage organizational buying

process accordingly and more efficiently. Figure 5 shows this taxonomy and some examples to these business services.

**Figure 5.** A Taxonomy for Purchasing Business Services

|                         |          | <b>Importance of Service</b>                                                         |                                                                           |
|-------------------------|----------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
|                         |          | Low                                                                                  | High                                                                      |
| <b>Focus of Service</b> | Property | <b>Facility Support:</b><br>-Laundry<br>-Janitorial<br>-Waste Disposal               | <b>Equipment Support:</b><br>-Repairs<br>-Maintenance<br>-Product Testing |
|                         | People   | <b>Employee Support:</b><br>-Food Service<br>-Plant Security<br>-Temporary Personnel | <b>Employee Development:</b><br>-Training<br>-Education<br>-Medical Care  |
|                         | Process  | <b>Facilitator:</b><br>-Bookkeeping<br>-Travel Booking<br>-Packaged Software         | <b>Professional:</b><br>-Advertising<br>-Public Relations<br>-Legal       |

Source:Fitzsimmons et al., 1998: 375

Fitzsimmons et al. (1998) make certain propositions depending on their classification dimensions:

1-As the focus of service moves from property to people and to process the level of interference in the decision making process increases

2-As the focus of service moves from property to people and to process the evaluation of the service gets harder and generally past performance or professional certification is used for assessment.

3-As the focus of service moves from property to people and to process the requirement of nearby location for the service provider decreases.

4- As the importance of the service decreases the evaluation of the service provider is done upon cost considerations

5-As the importance of the service increases the loyalty to the service provider increases.

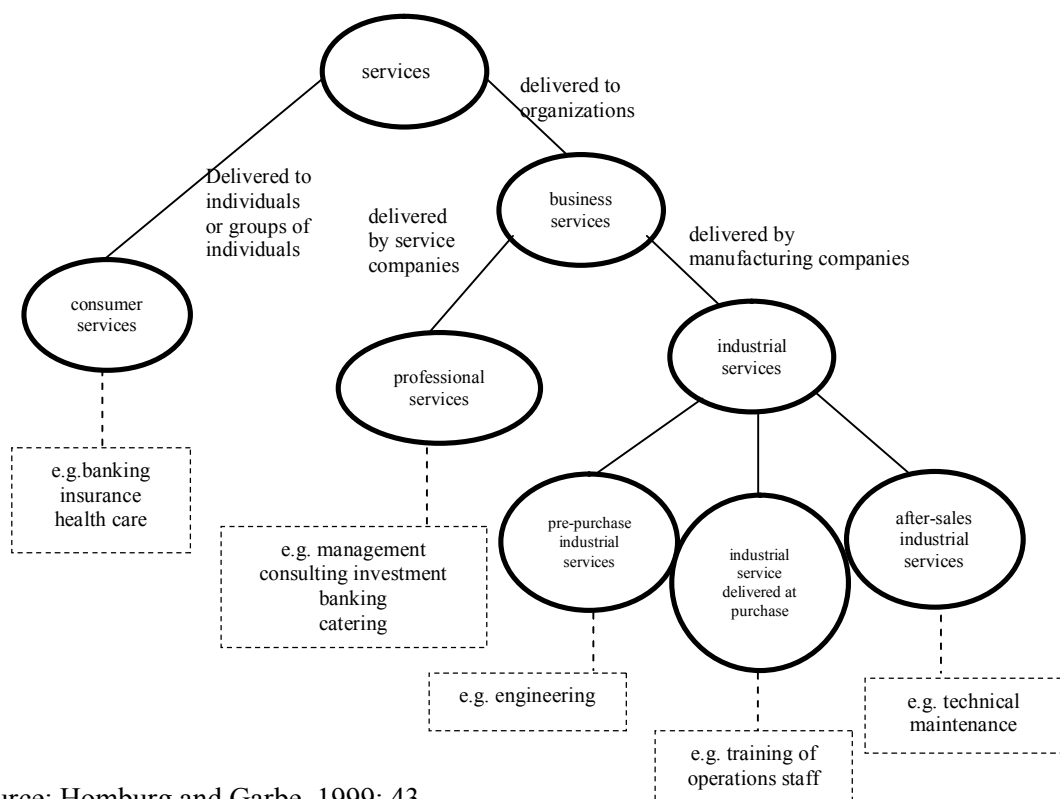
As the results of the class analysis, they suggest that for facilitator services knowledge of alternative suppliers that may be derived from references or third party evaluations is important and end users should be involved in both specification and purchasing processes. For professional services top level management should be

involved in decision making process and the reputation of the supplier is very important (Fitzsimmons et al., 1998).

Homburg and Garbe (1999) proposes a distinction between the terms business services, industrial services and professional services. Their classification starting from services concept is shown on Figure 6. According to this figure, under the general business services heading, independent service companies are called professional service providers and services delivered by production companies are called industrial services. However, Ervardsson et al. (2008) provides five different points that professional services and industrial services have actually in common. These are:

- 1- Both type of companies need to take a relationship approach to business.
- 2- Unconventional methods are required in both, for initiating relationships.
- 3- Both companies offer mainly intangible service elements which constitute projects for their customers.
- 4- Both have various types of buyers and this complicates the process even more.
- 5- Both need a decently communicated time frame for serving their offerings.

**Figure 6.** Taxonomy of Services



Source: Homburg and Garbe, 1999: 43

Mathieu (2001a) distinguishes industrial services into two main headings: services that support the supplier's product (SSP) and services that support the customer's actions related with the supplier's product (SSC). Salle et al. (2000; cited by Mittila, 2012) call these industrial services SSC1 and introduce SSC2 for industrial services dealing directly with the customer's functional processes like production, communication or research and development without a relation with the supplier's product. In addition to SSP, SSC1 and SSC2, a fourth type of industrial services are abbreviated with SSCN. These SSCNs are defined as the services supporting the customer's network actors (Cova and Salle, 2008). These services are generally used for selling complex solutions for specific customer problems. So they are mainly related with project marketing and systems selling.

### ***Focus-oriented Classification Efforts for Industrial Services***

As an opposing approach to supplier centered views in industrial service classification, Wynstra et al. (2006) focus on the application of the bought service in the customer organization's business processes. By enhancing a prior classification called maintenance, repair and operating supplies (MRO) services and production services, they introduce four main types of industrial services. These are component services, semi-manufactured services, instrumental services and consumption services.

Component services are services that are transferred to the end user without any transformation by the customer organization. Semi-manufactured services require further processes before being delivered to the final user. Instrumental services are the services bought by the organization to operate the primary business functions but are not delivered to any end users. Consumption services are for the routine and less complex consumption by the purchasing organization and generally are not related with the main business processes of the company (Wynstra et al., 2006). These industrial service classifications are empirically tested in case studies and it is found out that different companies adapt a contingent approach for buying different business services. There is not a single best practice (van der Valk, 2008).

In the analysis of different capital equipment manufacturers' service offering lists, different industrial service labels like product-related services, product services, service strategy in manufacturing or aftersale services were found (Oliva and Kallenberg, 2003). Durable goods or capital goods require services associated with the utilization of the physical product throughout its lifetime like installation, upgrades, spare parts, repair and maintenance (Mittila, 2012). Oliva and Kallenberg (2003) introduce the term "product's installed base" (IB) and state that IB services are all the services that a product or process requires throughout its useful life in order to operate effectively.

They extend their classification based on the transaction versus relationship orientation and product focus versus end-user process focus of the industrial service. Based on these dimensions, four different typologies of industrial services are listed (Oliva and Kallenberg, 2003):

- Product oriented; transaction-based services: basic IB services like documentation, transportation, product-oriented training, call center, inspection services etc.
- Product-oriented relationship-based services: maintenance services like preventive maintenance, spare parts management etc.
- End-user process oriented; transaction-based services: professional services like consulting, process training, testing, optimization, simulation etc.
- End-user process oriented; relationship-based services: operational services like managing operations or managing maintenance.

Another classification is done in an evolutionary manner from lower integration level towards higher integration level. Embedded services represent the services bundled with the product like information technology services delivered with industrial machinery. Comprehensive services are services around a product that the company outsources. These services require relationship marketing practices as they create long lasting relations between the buyer and the seller. Integrated solutions are combination of goods and services in a seamless manner for the solution of a complex customer problem (Wise and Baumgartner, 1999).

A different study takes an international perspective towards professional services. This classification is based on who or what crosses international borders. According to this dimension there are four main classes of international services (Clark et al., 1996):

1- Contact-based services: These services are delivered through people whom personally cross borders and offer the service themselves like consultancy services or international labor.

2- Vehicle-based services: In this type of services, a vehicle is used for delivering the communications like a foreign TV channel broadcasting through a satellite.

3- Asset-based services: To deliver these services, the service provider has to make a foreign direct investment like establishing a bank branch.

4- Object-based services: These services are crossing borders with accompanied products like a computer software or equipment repair.

Kowalkowski (2008) develops two main dimensions: service scope and service focus. Service focus is the same with Oliva and Kallenberg's (2003) approach in which the service is either related with the product or the process. Service scope is related with the service being either bundled with other services or being sold independently from other business services.

In a research on service networks as a form of interorganizational network, the service networks are defined as an ideal form of innovative service solutions through the exchange between the partners within the network. These innovative solutions are mainly offered for solving complex customer problems that require the combination of more than one service and sometimes product. These solutions are generally not achievable by the network partners independently. So the network creates a synergy for the benefit of the customers (Gaur et al., 2005). Oftenly, a customer solution contains both products and services that are integrated and adapted with other goods and services within the solution and is mainly customized according to specific customer requirements (Tuli et al., 2007).

### *Summary*

A summary of the industrial services classification efforts which either take the supply-side view as basis or adopt a focus-orientation are given on Table 4. This summary provides the results of an extensive literature review on industrial services.

**Table 4.** Classification of Industrial Services: A Summary

| <b>Author/(s)</b>                                    | <b>Focus of Classification</b>                                                                                          | <b>Industrial Service Classes</b>                                                                                                                                                                                       |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Boyt and Harvey (1997)</b>                        | High, medium or low:<br>-Replacement rate<br>-Essentiality<br>-Complexity<br>-Personel delivery<br>-Credence properties | -elementary services<br>-intermediate services<br>-intricate services                                                                                                                                                   |
| <b>Fitzsimmons et al. (1998)</b>                     | Focus of service:<br>-People<br>-Processes<br>-Property<br>Importance of service:<br>-High<br>-Low                      | -Facilitator services<br>-Employee support services<br>-Facility support services<br>-Equipment support services<br>-Employee development services<br>-Professional services                                            |
| <b>Homburg and Garbe (1999)</b>                      | If the service is provided by:<br>-A service company<br>-A manufacturing company                                        | -Professional services<br>-Industrial services                                                                                                                                                                          |
| <b>Mathieu (2001a)</b>                               | The entity that the service supports                                                                                    | -SSP (support supplier's product)<br>-SSC (support customer's actions with the supplier's product)                                                                                                                      |
| <b>Salle et al. (2000)<br/>Cova and Salle (2008)</b> | Extension of Mathieu (2001a)                                                                                            | -SSP<br>-SSC1 (the same with Mathieu, 2001a)<br>-SSC2 (support customer's functional processes)<br>-SSCN (support customer's network actors)                                                                            |
| <b>Wynstra et al (2006)</b>                          | Application of the bought service in the customer organization's business processes                                     | -component services<br>-semi-manufactured services<br>-instrumental services<br>-consumption services                                                                                                                   |
| <b>Oliva and Kallenberg (2003)</b>                   | Oritentation:<br>-Transaction<br>-Relationship<br>Focus:<br>-Product<br>-End-user processes                             | - Product oriented; transaction-based services<br>- Product-oriented relationship-based services<br>- End-user process oriented; transaction-based services<br>- End-user process oriented; relationship-based services |
| <b>Wise and Baumgartner (1999)</b>                   | Integration level                                                                                                       | -Embedded services<br>-Comprehensive services<br>-Integrated solutions                                                                                                                                                  |
| <b>Clark et al. (1996)</b>                           | International transactions                                                                                              | -Contact-based services<br>-Vehicle-based services<br>-Asset-based services<br>-Object-based services                                                                                                                   |

These classification efforts are dependent on several different theories and all take a different perspective. They will be used in the conceptualization of the logistics service under a certain class of industrial services. However, several classifications take the industrial buyer behavior as an important dimension in the taxonomy building process as in general marketing's goal is to satisfy the customer demands. In addition to that, organizational buying behavior (OBB) and its antecedents are essential criteria in terms of measuring the LSPs' propensity in buying logistics center services. Inline with the aim of this study, organizational buyer behavior will be explored in depth together with its existing models and literature.

### **2.2.3.2. Industrial Buying<sup>2</sup>**

Although Wilson (2000) argues that dividing the generic buyer behavior field into two distinct titles creates excessive complexity, industrial buying is accepted to be a much more complicated process when it is compared with consumer buying process due to the number of participants that take part in it and the variety of their impact on the purchasing decision (Morris, et al., 1999). Organizational buying has a complex and interpersonal structure (Bunn, 1994) and understanding the buying organization is a more complicated process as it should be supported with a comprehension of the larger organizational network formed by interdependent elements (Webster and Wind, 1972b). Webster and Wind (1972a: 1-2) defines organizational buying as:

*“a complex process of decision making and communication, which takes place over time, involving several organizational members and relationships with other firms and institutions and also as “the decision making process by which formal organizations establish the need for purchased products and services and identify, evaluate and choose among alternative brands and suppliers.”*

Two economic theories are integrated with organizational buying: managerial economics and industrial organization theory. Managerial economics theory introduces mathematical models optimizing what to buy, from whom to buy and how

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<sup>2</sup>In this study, organizational buying and industrial buying are used synonymously. Business services, industrial services and professional services differences are explained by referring to the related study but are used synonymously to define services traded between organizations.

many to buy in an organizational buying setting. Industrial organization theory, on the other hand, introduces the economic relations among organizations (Nicosia and Wind, 1977). Industrial organization theory was further developed by IMP studies by Scandinavian schools of research especially towards to the studies of industrial networks and interaction as mentioned in the previous section.

In a former review study, Wind (1978) states that depending on the existing work on organizational buyer behavior, the field needs to be established as a separate discipline. The research traditions in this field are about complex model building, unit of analysis as the buying center, conjoint analysis studies for specification of the evaluation criteria in organizational buying, interorganizational relationship structures, responses to marketing strategies and segmentation of organizational buying markets.

In a more recent article, on the other hand, Wind (2006) states that the lines between organizational markets and consumer markets are blurred as business-to-business (B2B) and business-to-consumer (B2C) markets converge with the invention of internet and rise of small business on the web. There are vague lines in other dimensions of the markets as well like the value chains which are extending more and more and majority of the work is being done by a network of firms rather than a single company. Customers are much more involved in production design and delivery so the distinction between the seller and the customer is blurred. The functions within a company boundaries are much more integrated through electronic data interchange(EDI) and other knowledge based systems which also transform the industrial society defined by products and services towards a knowledge-based society defined by complex solutions. These changes all effect the organizational buyer behavior and organizational buying process.

The components of the organizational buying processes can be grouped under four main categories (Nicosia and Wind, 1977):

- 1- General organizational characteristics like size, industry, nature of operations and such.
- 2- Situational organizational characteristics like amount and type of purchases or supplier selection criteria and such.

3- General characteristics of the individual decision maker(s) like age, tenure, position in the organization and such.

4- Situational characteristics of the individual decision maker(s) like attitude toward suppliers, response to market drivers and such.

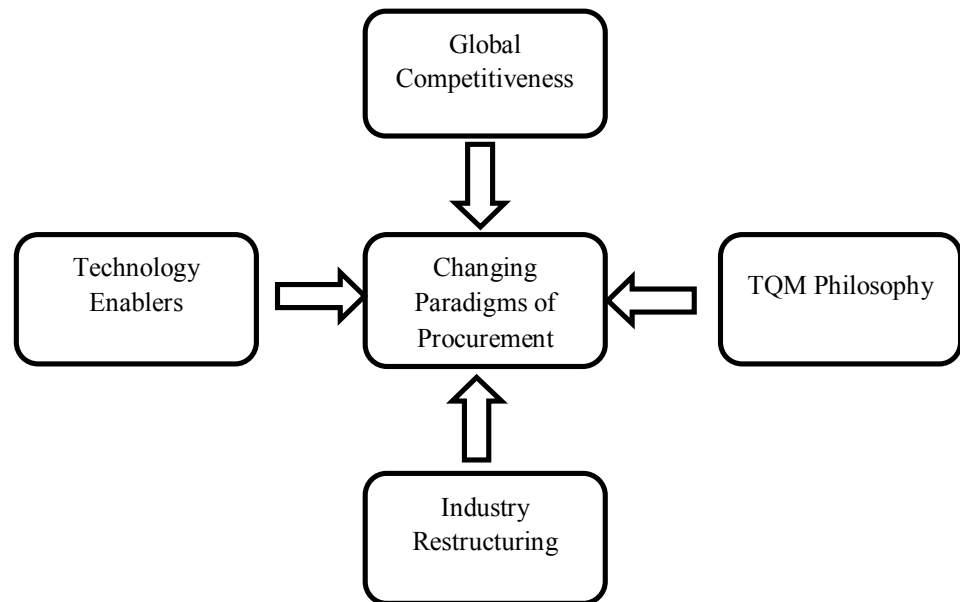
The organizational buying literature models are theoretically different than the organizational marketing or selling literature models (Nicosia and Wind, 1977). These differences result due to the introduction of interaction based, interdependent actors in an industrial network (Hakansson, 1982) whom co-create value (Vargo and Lusch, 2004a). Sampson (2000) states that due to the value co-creation process in the service production in which the buyer is involved in the production process, there is a customer supplier duality where interaction has strategic importance and where the customers also become the service providers.

There is a certain bridge between relationship marketing theory and organizational buying (Tanner, 1999). Additionally, according to Hunter et al. (2006), although relationship marketing theory and network theory refer to close relationships between buyers and sellers in industrial markets, the current relationships in such markets exhibit a heterogeneous structure depending on the properties of the purchase requirements.

The interorganizational perspective in organizational buying is important in order to align selling processes to the existing and forthcoming requirements of the buying organization (Nicosia and Wind, 1977). It is very important for the service provider company to know its own offering and the customer's offering in order to match and synchronize the production with the demand patterns (van der Valk, 2008).

Sheth and Sharma (1997) project the future of industrial buying behavior depending on the developments in the interactions between the industrial actors. According to them firms' relationships with their suppliers will gain strategic importance in the future and this importance will require a change in the organizational buying process of companies (Sheth and Sharma, 1997). The paradigm of organizational buyer behavior will be effected by four main forces as depicted in Figure 7.

**Figure 7.** Changing Paradigm of OBB



Source: Sheth and Sharma, 1997: 93.

As transaction oriented buying shifts towards relationship oriented buying (Webster, 1992) and as domestic sourcing is replaced by global sourcing (Bello and Zhu, 2006; Trautmann et al., 2009), the existing academic theory and research on the buying center dynamics, sources of interdepartmental conflict, make or buy decisions will become obsolete. Cross functional purchasing teams collaborating with suppliers will replace the buying center. Multiple suppliers serving to a focal purchasing organization will constitute the hub and spoke systems of organizational networks (Sheth and Sharma, 1997).

### ***Research Streams in Organizational Buyer Behavior***

One of the most popular research areas in OBB has been the decision making process, antecedents (e.g. McQuiston, 1989), mediating and moderating contextual variables (Sheth, 1996). A widely recognized model that classifies the organizational buying types is the buyclass<sup>3</sup> (/buygrid) framework of Robinson et al. (1967) which states that there are three main types of industrial purchases: (1) Straight Rebuy, (2) Modified Rebuy, (3) New Task. Due to the variety of contingent variables and

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<sup>3</sup>This model is explored in detail at part 2.2.4.2.

samples, the research on organizational buying process is not able to offer general and generic solutions to the overall problems in the field. In a generalization effort of the organizational buying process, Woodside (2003) investigates 28 different buying centers through their buying processes from a single industry which is the office furniture industry. The author, interviews both the buying center and the seller firm in order to follow up a matching structure of decisions and stages. As a result he finds that organizational size, cost of the purchase, design requirements, dealer competition level and availability of a formal bidding process are contextual variables valid in the organizational buying process.

Some of the existing streams of research in the field of organizational buying can be summarized as below:

- Script development of an industrial procurement process from the buying organization's point of view (Leigh and Rethans, 1984);
- Effects of internet and electronic commerce tools on industrial buying (Osmonbekov et al., 2002);
- Information sources being used through the industrial buying process (Moriarty and Spekman, 1984);
- Perceived risk in the buying process and benefits for e-business (Hunter et al., 2004);
- Risk management in organizational buying process (Jarvi and Munnukka, 2009)
- Industrial buyer seller interaction in relationship development phases (Claycomb and Frankwick, 2010);
- Industrial product buying criteria (Bharadwaj, 2004);
- Antecedents of decision making time spent in organizational buying process (Dholakia et al., 1993);
- Outcomes of the organizational decision making process (Barclay, 1992);
- Socially responsible industrial buying (Drumwright, 1994);
- Effects of organizational restructuring on OBB (Lewin and Johnston, 1996) and
- Trust in industrial services buying (Gounaris and Venetis, 2002).

In addition to these, significant amount of research has been dealing with conflict management in the buying center (Lambert et al., 1986; Barclay, 1991) and buying center characteristics and influential forces (Kohli, 1989; Dadzie et al., 1999; Kauffman, 1996; Dawes et al., 1998; Silk and Kalwani, 1982; Lau et al., 1999; Jackson et al., 1984; Gao et al., 2005).

Apart from these, research streams on power, dependence, and transaction cost through buyer-supplier relationships within channels, supplier partnerships, networks and interaction and use of information technology in supplier partnership have gained significant attention (Sheth, 1996).

A recent study stands from the practical-theoretical research point of view and defends that due to the unpredictable nature of the business world, the rational and systematic approaches towards organizational buying process are not applicable. Instead, the authors employ an incremental and exploratory, trial-and-error approach to the case study that they conduct (Makkonen et al., 2012).

Academic research on organizational buying is dominated with physical goods. Research on the procurement of organizational services is required to determine their differences, specialties and buying models (Sheth and Sharma, 1997). Knowledge in purchasing and supply chain management is generally limited with buying physical goods and information about buying business services is limited (van der Valk, 2008).

However, opposing to the traditional non bill-of-material condition of business services, more and more manufacturing companies are adding business services to their offering portfolios (van der Valk, 2008) which is called service maneuvers by Mathieu (2001b).

According to Mathieu (2001b) service maneuvers, which are the changes that manufacturing company offerings towards more services, should be classified depending on their typologies. He suggests three types of service maneuvers based on their service specificity: customer services like toll free lines, product services like guarantees and, services as a product like car repair service for all cars event the competitors'.

Services buying is a more complicated process to evaluate for the buyer as services are harder to be measured and they are less specified with concrete criteria

(Fitzsimmons et al., 1998). Stock and Zinszer (1987) state that the purchase of business services is different and harder than purchasing industrial goods.

There are few studies in services marketing literature that study the marketing of industrial services. Fewer studies choose to look from the organizational buyers' perspective while investigating industrial services. However, buyers perceive significant differences while buying industrial services (Jackson et al., 1995).

In a systematic literature review of business services sourcing, it is found out that the majority of the articles being written on this subject are published in logistics journals. So there is an existing interface between logistics and business service sourcing. However, it is mainly centered around third party logistics outsourcing and type of logistics services being outsourced. Barriers to logistics outsourcing is also among the studied topics (Nordin and Agndal, 2008). Again in this literature review, it is found out that some geographical areas like North America and Western Europe have a dominance in service sourcing research. It is important to conduct related research in emerging economies as well (Nordin and Agndal, 2008).

However, there said to be a theoretical gap in the existing empirical research on business service buying. It is important to base future research on solid theoretical roots like the recently emerging service dominant logic (Vargo and Lusch, 2004a; 2004b). If the theoretical basics of goods-dominant logic (GDL) and service-dominant logic (SDL) are applied to industrial service procurement there needs to be two different approaches to the process by industrial buyers. According to Lindberg and Nordin (2008) GDL in services procurement implies a standardization and objectification of the buying process in which buyers and sellers have an arm's length relationship and can be substituted easily. SDL in services procurement implies that standardization of services is not possible as every service interaction is a co-creation of value between the two actors and this process is realized through long lasting relationships between the buyer and the seller. Their study states that some basic and routine services are bought with a GDL but complex services and integrated solutions that are of strategic importance to the purchasing firm need a SDL approach towards the organizational buying process.

### ***The Stages and Components of Organizational Buying Process***

Decision process models suggest different versions of decision making stages in an organizational buying process<sup>4</sup> (Robinson et al., 1967, Hutt and Speh, 2010). Bunn (1993; 1994) conceptualizes four main general constructs related with the organizational buying process and tries to specify the real activities that are being performed during these stages through a scale development study. These four constructs are defined as (Hunter et al., 2006):

Procedural Control: The extent to which the buying process is delimited by established rules, procedures and policies.

Proactive Focusing: The extent to which the firm posits the procurement decision as a part of the company's long-term decisions or as a strategic action.

Formal Analysis: The extent to which the buying process decisions are made through the help of several analytical tools in a systematic manner.

Search for Information: The extent to which the buyer investigates the existings alternatives both in terms of suppliers and also in terms of substitute products or services.

In practice, the existing stages of the procurement process such as need recognition, information search, evaluation and selection do not follow a systematic pattern in every purchase situation (Hunter et al., 2006). Many dimensions of the organizational buying process are practically blurred, despite being distinct in theory (Bunn, 1994).

Hunter et al., (2006) introduces a model that specifies the interdependent nature of the above mentioned four main organizational buying process constructs. They also complement their model with three contextual variables as the importance of the purchase, extensiveness of the choice set and the buyer power. As a result of their research, they find out that when a purchase situation is an important one for the company, the buyers follow contingent steps beyond the existing procedural control, they make extended information search and they move with a proactive long range focus. This model is further analyzed in a Far Eastern setting and the study confirms

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<sup>4</sup>The stages are discussed in detail at the Buygrid Model part.

that different type of buying situations given in Robinson et al.'s (1967) Buyclass Framework require different approaches to these four main components of the buying process (Moon and Tikoo, 2002).

### ***The Buying Center Concept***

Organizational buying deals with not only activities realized during the buying process but also the people who perform these activities needed to operate the process. The groups of these people who are involved in the organizational buying process for a particular product or service are called the buying center (Robinson et al., 1967).

An organizational buying decision may be related with nearly every person in an organization. When operationalized, the human resources department actually purchases manpower, the finance department purchases financial instruments so they are all involved in an organizational buying decision; not only the purchasing department. So for an extensive understanding of the organizational buying process, one should not be limited with the activities taking part under the duties of the procurement department (Nicosia and Wind, 1977).

Buying centers which are also called Decision Making Units (DMU) (Moriarty and Bateson, 1982) can be defined as “informal cross sectional decision units whose membership compositions change through time and by phases in the buying process” (Woodside, 2003: 330). The buying center is composed of all those people who are involved in the buying process of a product or a service. They need not to be a member of the official purchasing department and they act as the purchasing decision unit for the company (Pae et al., 2002).

It is important to trace and record how many different people and groups take part in an organizational buying decision process in building up an organizational buying model (Nicosia and Wind, 1977). The number of the members and the composition of the buying center may change depending on the specific organizational buying needs (Spekman and Gronhaug, 1986; Spekman and Stern, 1979).

The tasks of the buying center are generally composed of completing the procurement process, evaluating the results and operating the logistics process in order deliveries (Chandler and Johnston, 2012). While performing these tasks, the members of the buying center play different roles like the user, gatekeeper, influencer or decider (Webster and Wind, 1972a). Users are the members of the organization who will actually use the product or service. Gatekeepers are members located on the border and they control the flow of information in to and out of the buying center. Influencers have an impact on the decisions of the buying center. They may be located in or out of the buying center. Deciders are the members who finalize the buying decision in a purchase process (Bingham et al., 2005).

Initiators are mentioned in some other studies (e.g. Chandler and Johnston, 2012) whom start up the buying process by identifying a need or requesting a purchase. Policy makers, purchasers (buyers) and technologists are other roles played by buying center members (Turnbull and Leek, 2003). Policy makers decide on the macro policies about from whom to buy, either to import or source domestically or buy through bids or private offers. Purchasers are the ones who give the purchase order and complete the transaction in the process. Technologists are the specialists who seize the expertise for evaluating the technical performance of different products or services (Turnbull and Leek, 2003). Ronchetto et al. (1989) defend that the formal structure of the organization, and the structure of the network that the buying center belongs to constitute the main drivers for these individuals' influence in the buying center's final decision.

Johnston and Bonoma (1981) introduce five interactive dimensions in a buying center as vertical involvement, lateral involvement, extensivity, connectedness, and purchasing manager centrality. Vertical involvement refers to the number of vertical hierarchy members whom have an influence on the buying center. Lateral involvement is the number of members belonging to different functions or divisions of the firm who are involved in the buying decision. Extensivity is the total number of individuals involved in the organizational buying decision. Connectedness refers to the extent to which the members of a certain buying center have direct communication opportunities with each other. Centrality is the number of direct connections of the purchasing manager with the other members of the buying center.

In their study, they find out that organizational structural variables like size, complexity, formalization and centralization plus purchase situation attributes like importance, complexity, buyclass category and type of purchase (product or service) have various effects on these five dimensions of the buying center (Johnston and Bonoma, 1981).

In a more recent study on Finnish firms, depending on the extensivity, lateral and vertical involvement in the buying centers and their buyclass types, it is found out that the structures of buying centers are highly dynamic. The various types of buying centers that operate under different circumstances are classified into five main groups (Jarvi and Munnukka, 2009:452):

- 1- expert, inward-oriented informal networks;
- 2- extensive, specialist, and inward-oriented formal networks;
- 3- extensive, more management, and outward-oriented co-operative networks;
- 4- specification-oriented management and responsibility-led co-operative networks; and
- 5- management-led specialist-oriented versatile networks.

As a result, the boundaries and member numbers of a buying center are necessarily heterogeneous due to the specific types and conditions of the different buying situations. Wilson et al. (1991) define the situational factors as the buying task and the perceived risk with the purchase action and they claim that a contingency approach is the best predictor for the buying center choice. Also the decisions of the individual members of a buying center may change in time (Morris et al., 1999).

Once the buying center of a specific organization for a specific purchasing process is determined, it is essential to explore the components of the organizational buying process. The components of this process have been defined through several models. An extensive listing of studies taking the three basic organizational buying models (Robinson et al, 1967; Sheth, 1973; Webster and Wind, 1972b) is presented by Sheth's (1996) evaluative study on past and the future of organizational buying. However, these are complex models which are preceded by some former basic models.

### **2.2.3.3. Alternative Views of Organizational Buying Behavior Models**

Webster and Wind (1972a) make an extensive review of organizational buying behavior models and divide them into three main groups. These are task models which emphasize task oriented variables like the price, non-task models which emphasize non-task variables such as human behavior and complex models where both dimensions are united. A summary of these models are as per below<sup>5</sup> (Webster and Wind, 1972a):

1. Task Models
  - i. The Minimum Price Model: Organizational buyer is focused to buy the intended product or service at the minimum available price.
  - ii. The Lowest Total Cost Model: Organizational buyer is focused to minimize the total cost of the purchased good or service including the malfunctioning costs or opportunity costs.
  - iii. The Rational Buyer Model: Organizational buying process is a rational economic choice process.
  - iv. The Materials Management Model: Organizational buying process is handled by the chief procurement executive and he/she is focused to manage the lowest cost and seeked quality materials in and out of production.
  - v. The Reciprocal Buying Model: Organizational buying process focuses on purchasing from suppliers who, in return, purchase from the organization.
  - vi. The Constrained Choice Model: The alternative set of suppliers of an organizational buying process are determined by the constraints specified by the members of the buying organization. So some suppliers are included and some are

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<sup>5</sup>Unless otherwise stated, the summary of these models are derived from Webster and Wind (1972a).

excluded from these alternatives set depending on the source loyalty tendencies of the buyers.

## 2. Non-Task Models

i. The Self-Aggrandizement Model: The organizational buying process is used by the buyer for improving his/her individual benefits through accepting gifts or even bribery.

ii. The Ego-Enhancement Model: Organizational buyer manages the buying process with emotional factors and expect his/her value to be recognized by the supplier.

iii. The Perceived Risk Model: Extended into industrial buying by Levitt (1965; cited by Webster and Wind, 1972a) and states that the organizational buyer would focus on minimizing the perceived risk (probability of an event to occur and the possible results of this event) of the organizational buying process.

iv. The Dyadic Interaction Model: As cited by Webster and Wind (1972a) from Evans (1963), this model refers to the similarity of characteristics between the seller and the buyer. So according to the model a buyer would prefer to buy from someone who is like him/her.

v. The Lateral Relationships Model: Apart from the dyadic interaction model between the buyer and the seller, lateral relationships model considers the relationships between the purchasing agent and the other more or less influential members of the buying center. The purchasing agent tries to enhance his/her power in the organizational buying decisions through the manipulation of these relationships.

vi. The Buying Influences Model: This model concentrates on the influences of all the members in a buying center rather than focusing only on the purchasing agent.

vii. The Diffusion Process Model: This model does not refer to the decision making process much, but it rather

focuses on the firm as a passive member of the social system and offers specific firm characteristics for accepting early or late adoption of recently developed products in the market (Webster, 1969).

### 3. Complex Models

i. The Decision Process Model: This model divides the decision making process to five stages in which both task and non-task variables are incorporated. These are (1) problem recognition, (2) identification of alternatives, (3) evaluation of alternatives, (4) selecting a course of action and (5) implementation.

ii. The COMPACT Model: The Competence Activity Model is developed by Robinson and Stidsen (1967; cited by Webster and Wind, 1972a) and has three dimensions: (1) activities of organizational buying decisions like awareness, acquisition, goal seeking, harmonization and commitment; (2) organizational roles like the doer, supervisor, operating management, integrative management or top management; (3) individual competence level ranging from a physical activity to values integration.

iii. Simulation Models: These models extend the variables of existing organizational buying models in order to evaluate the impact of change in the parameter values. These variables may be task, non-task or a combination of all these various dimensions.

iv. Buygrid/Buyphases Model: Robinson et al.'s (1967) buygrid model divides the organizational buying situations into three different types based on an empirical study. These are straight rebuy, modified rebuy and new task purchase types. Straight Rebuy refers to a routine problem solving situation where the procurement process is an exact replication of the former processes. The buying criteria is specified

throughout the previous evaluations so little or no modification is needed for the purchased product or service. In the Modified Rebuy situation the buying center has existing information about the product or service to be purchased but they still evaluate further alternatives and collect incremental information for either cost reductions or market changes. Limited problem solving is required in this type of purchase. New Task is a completely new organizational buying process which requires extensive problem solving effort through the exploration of all steps in the process (Hutt and Speh, 2010). There are various studies that empirically test this buyclass model (e.g. Anderson et al., 1987).

The buygrid model states that organizational buying decisions vary on two different dimensions. The first one is the buying phase, the second one is the buying type or class. Table 5 shows which buying phases are applicable in which types of buying classes.

**Table 5.** The Buygrid Model

| Buyphases                           | Buyclasses |                 |                 |
|-------------------------------------|------------|-----------------|-----------------|
|                                     | New Task   | Modified Re-buy | Straight Re-buy |
| Identification of need              | X          | X               | X               |
| Determination of requirement        | X          | n/a             | n/a             |
| Specific description of requirement | X          | n/a             | n/a             |
| Search for potential sources        | X          | n/a             | n/a             |
| Examination of sources              | X          | n/a             | n/a             |
| Selection of source                 | X          | X               | X               |
| Order routine established           | X          | X               | n/a             |
| Evaluation of performance feedback  | X          | X               | X               |

Source: Robinson et al., 1967

Hutt and Speh (2010) adds several additional steps as per below by reviewing the related literature. According to their exhibition of the organizational buying process, the buying stages are:

- 1- Problem Recognition: The need for a purchase arises and is noticed by a member of the organization.
- 2- General Description of Need: The general characteristics of the product or service which is needed are specified.
- 3- Product Specifications: All the technical details of the product or service are specified by an expert.
- 4- Supplier Search: The alternative sources of supply whom are equipped to produce the product or service in compliance with the specifications are searched.
- 5- Acquisition and Analysis of Proposals: Alternative supplier offers are evaluated by the related buying center members.
- 6- Supplier Selection: The supplier is selected depending on the given criteria.
- 7- Selection of Order Routine: The delivery date and the delivery plan for the order is decided and organized.
- 8- Performance Review: The performance of the supplier is evaluated upon certain periods or after the purchase is completed.

During these stages, many decisions are made by the buying center members influencing the final purchase act. Each stage may require one or more different member sets belonging to the buying center group. Even though the buygrid model is a comprehensive model that improves earlier efforts to define organizational buying process steps (Turnbull and Leek, 2003), the existing model is not always applicable in real life cases where the decisions are made through short-cuts and practical processes (Ferguson, 1979).

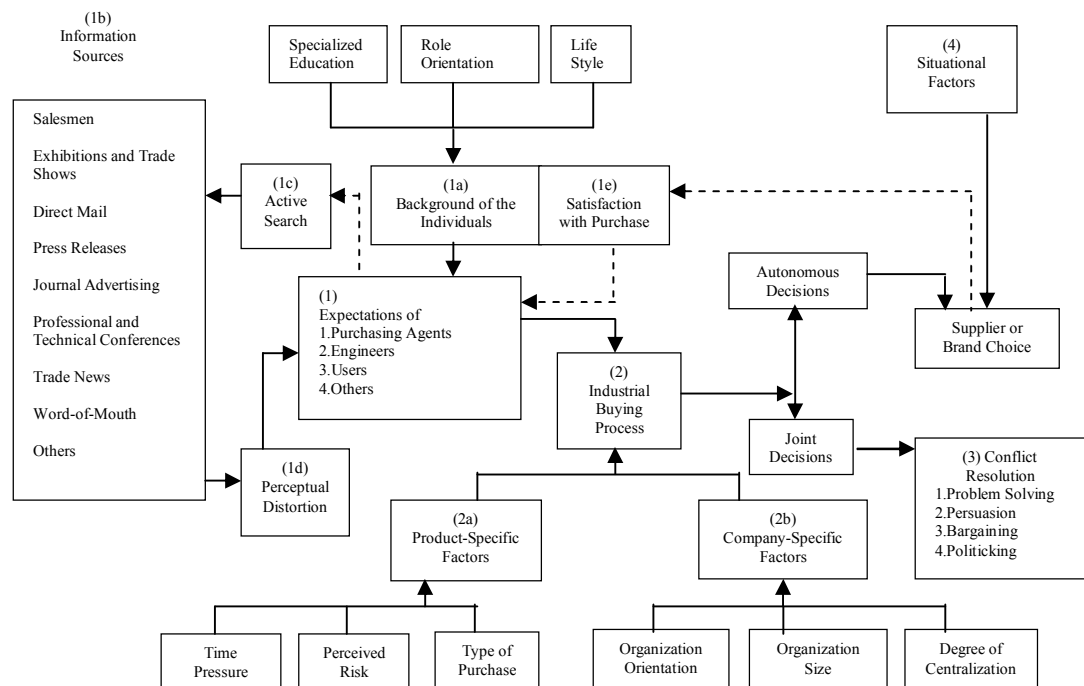
When all these task, non-task and complex models are analyzed, it can be concluded that they all deal with the organizational buying problem partially. More complicated models which take situational, personal, environmental, organizational forces into consideration are required. Sheth Model, Webster and Wind Model and some other incremental efforts are considered to be complex organizational buying models that carry multidisciplinary characteristics.

### *The Sheth Model*

The Sheth Model (Figure 8) focuses on the psychological states of the individuals that are located in the buying center of an organization. He states that there are different people that are coming from at least three different departments of an organization and are involved in this process. In order to understand the organizational buying process, their expectations (1) and the causes of the differences among the participants' expectations are stated as (1a) Background of the individuals, (1b) Information sources, (1c) Active search, (1d) Perceptual distortion and (1e) Satisfaction with previous purchase.

The determinants of autonomous versus joint decision making are composed of six different dimensions located under two broad headings: Product-specific factors and Company-specific factors. In general low-risk decisions, with significant time pressure and either a straight or a modified rebuy situations, the decision making can be an autonomous one. However as the organization gets larger and decentralized, it is more likely that the organizational buying process will be a joint decision making process (Webster, 1991).

**Figure 8.** An Integrative Model of Industrial Buyer Behavior



Source: Sheth, 1973: 51.

The (3) conflict resolution procedures influencing the joint decision making process are also emphasized in the Sheth model (Şakar, 2010). Finally there are some (4) situational factors which are the factors that may arise and affect the industrial decision process and which are beyond individual and organizational factors. These are generally unexpected factors and constitute a broad area which can not be specifically predicted.

### ***The Webster and Wind Model***

Another widely accepted model of organizational buying behavior is Webster and Wind's (1972b) model. The model has four main levels that sequentially affect the buying process and the buying decisions. The first level is the environmental determinants of the buying behavior. Here the environmental determinants of the buyer behavior refer to the physical, technological, economic, political, legal or cultural environment. An organization experiences the influence of the environment through its several stakeholders like the suppliers, customers, labor unions, trade associations, competitors and such.

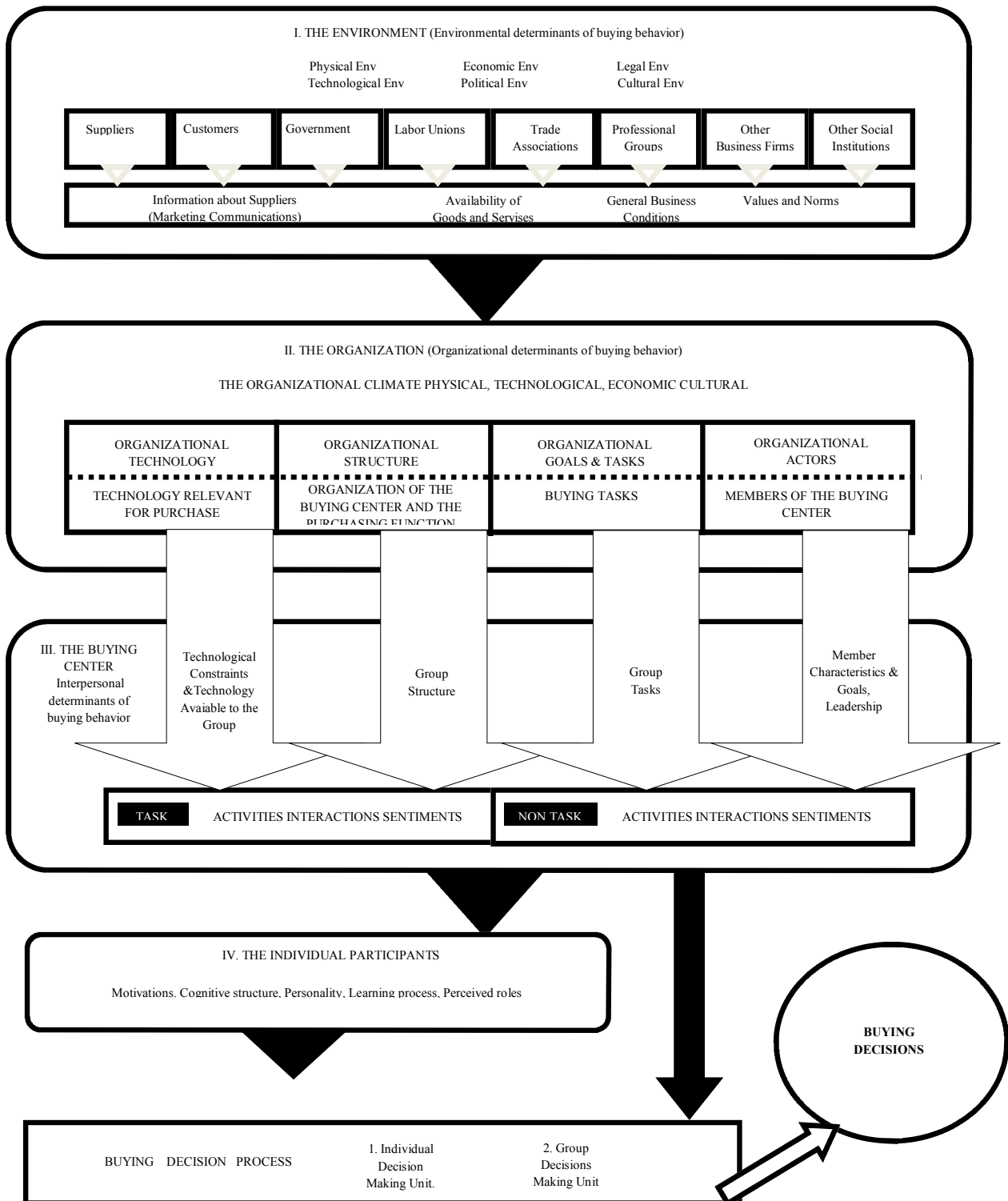
The effects of the environment influence the organization in four different ways according to the model. First, they are the sources of information regarding the suppliers' products and services. Suppliers use marketing communication tools in order to introduce their market offerings. Second, the physical, technological or economic environment significantly affect the availability of goods and services in markets. This is an important issue for an organization's purchasing department. Third, they influence the general business conditions like the economic growth, purchasing power or intensity of the competition. Finally, environmental variables affect the values and norms that define the relationships between organizations, within organizations and also in buyer-seller dyads. Cultural tendencies, laws, political changes all effect the organization in terms of its organizational buying process. An industrial marketer should analyze the environmental variables very carefully in order to review the existing conditions and probable changes in its customer organizations (Webster and Wind, 1972b).

At the second level, there are the organizational variables that cause the decision makers to act in a certain way, which they may not prefer if they were deciding for individual benefits or if they were working for a different organization. The four variables of the organizational influence are organizational technology, structure, goals and tasks and the organizational actors which all interact with each in order to form and lead the buying center in the decision making process. However, this decision making process is also constrained with the financial, technological and human resources of the company (Webster and Wind, 1972b).

The third level is the buying center where the emphasis is given to the social interaction between the members of the buying center. The four organizational variables of the second level are turned into group variables at the buying center level. The task and non-task determinants of the group buyer behavior are dependent on these variables. For example, financial resources of the company constitute a task determinant for the group and they may decide on the lowest cost alternative in a buying process due to this condition. The characteristics of the group members and their dyadic relationships with industrial sellers constitute the non-task determinant for the group. They both affect the process (Webster and Wind, 1972b).

The fourth and the final level is the individual participants' level where the motivation, perceived role, cognitive structure and personality of the individuals that constitute the buying center or involved in the buying decision process are considered (Webster, 1991). Webster and Wind (1972b: 18) states that: "*It is the specific individual who is the target for marketing effort, not the abstract organization.*" However, the individual buyer is also influenced by a complicated combination of individual and organizational determinants. So it is important to analyze an organizational buyer's preferences, tendencies and character within his/her organizational context in order to establish marketing strategies.

**Figure 9. Webster and Wind OBB Model**

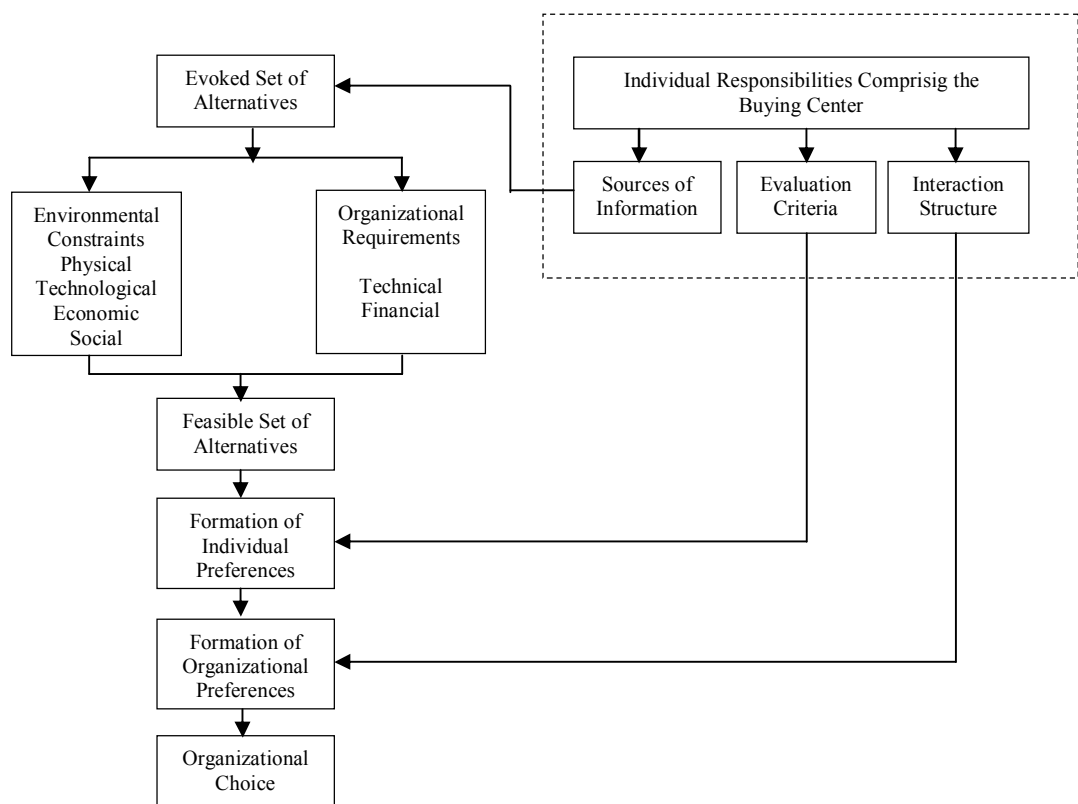


Source: Webster and Wind, 1972b: 15

### *Industrial Market Response Model*

The industrial market response model (Choffray and Lillien, 1978) proposes that the members of a buying center may have specific characteristics that lead them to decide in a certain way. These members form categories within a buying center and the deciders in the same category may use the same information sources and same evaluation criteria. Figure 10 shows the representation of this model.

**Figure 10.** Major Elements of Organizational Buyer Behavior



Source: Choffray and Lillien, 1978: 22.

The sources of information are used in order to specify the alternative suppliers. These alternatives are afterwards constrained by several environmental influences and organizational requirements. The ones that are able to pass through the filter of these variables become the feasible set of alternatives. The individual preferences of the buying center members are formed by the evaluation criteria shared by the categories in the center. Afterwards the individual preferences are

linked to group decision making and the organizational buying decision is finalized (Choffray and Lilien, 1978).

The model has four sub-models which are defined over the power balances and the situational factors prevalent in the buying center (Webster, 1991). Model is tested on new product adoption process by a buying center but the authors state that it is also feasible in modified purchases or re-positioning cases (Choffray and Lilien, 1978).

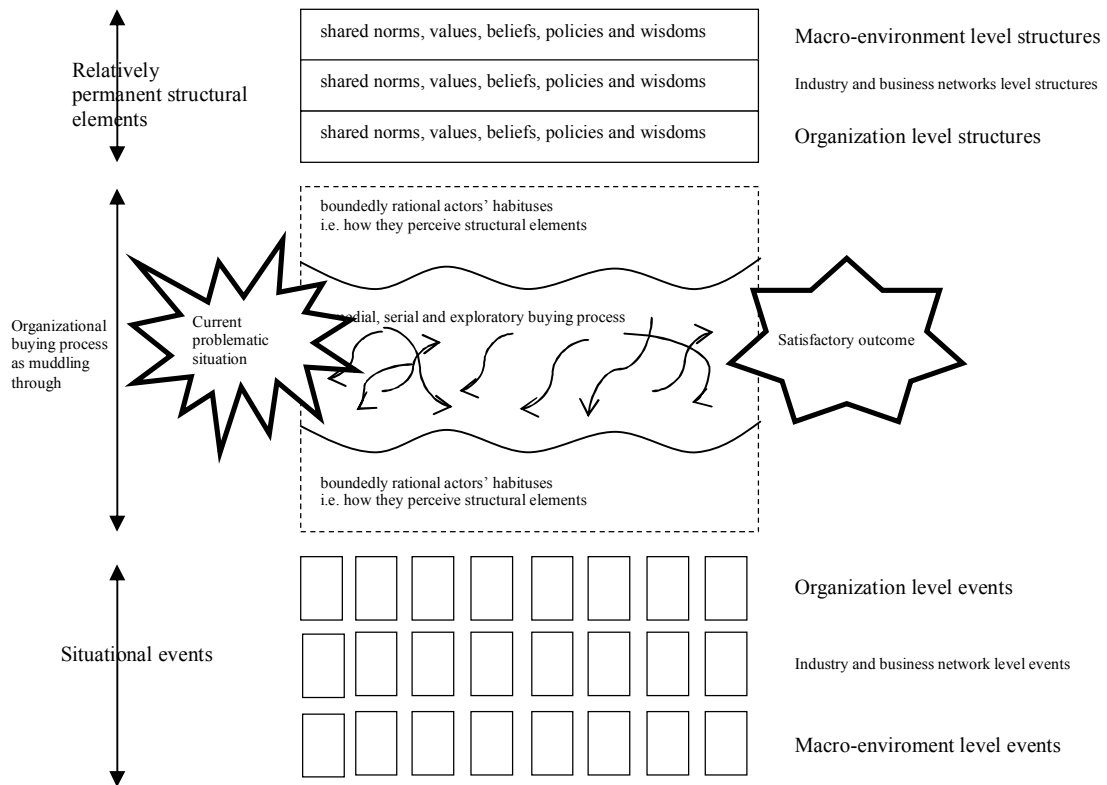
### ***Organizational Buying as Muddling Through***

The model offered by Makkonen et al. (2012) depends on their criticism over the rational, linear and systematic organizational buying behavior as they claim that the unpredictable nature of real business-life problems can only be solved by exploratory and incremental methods.

The model on Figure 11 is a practice-theory framework for organizational buying that uses muddling through method (Lindblom, 1959). The horizontal dimension on the figure refers to the time effect on organizational buying. The vertical dimension refers to the contextual variables like the industry, environment, organization or the network. On the left and at the top, the permanent structural elements are the established norms, beliefs, valid formal rules about the buying process which can result from macro-environmental forces, industry norms or organizational policies. At the bottom part of the model, the situational transient variables may rise due to the same forces again but they are generally discrete events that change a pattern (Makkonen et al. 2012).

The middle part of the model refers to the habitus of the buying center members, that is, how they perceive, interpret and respond to the changes or influences coming from the macro environmental, industrial or organizational forces. Through the use of habitus, the actor in the buying center, does not use mechanistic methods but utilizes previous experiences, personal evaluations or practical sense. So the organizational buyers do not systematically solve a problem by a comprehensive analysis; they rather try to move away from the problematic situation through rational real-life practices (Makkonen et al. 2012).

**Figure 11.**Organizational Buying as Muddling Through



Source: Makkonen et al. 2012: 774

### ***Other Models of Organizational Buyer Behavior***

Besides these general organizational buying models there are other attempts to take different points of view to the general framework of organizational buying process. The Anderson and Chambers Reward/M Measurement Model (1985) focuses on the performance evaluation method of the companies and the perceptions of individuals that take part in the buying center about these performance evaluation criteria. According to this model the conflicts between the buying center may arise due to these criteria and these conflicts will affect the group decision making process.

When the old dates of these developed models are considered, revisions or paradigm shifts should be adopted in order to adapt them to the dynamics of the industrial markets today. Wilson (1996) suggests and develops a systems perspective stating that the former buyer (customer) oriented organizational buying behavior

models have evolved to a more dyadic structure where the relation between the buyer and the seller is much more important. Sheth (1996) states that there is a two-dimensional shift in organizational buying behavior from the older transaction based domestic sourcing towards the relationship based global sourcing. He also attracts attention to the impacts of total quality management (TQM) philosophy on the industrial procurement practices together with Wilson (1996) who applies an industrial buying model on the theoretical just-in-time system.

Turnbull and Leek (2003) accept Hakansson's (1982) Interaction Approach as a separate model for organizational buying behavior and they illustrate a model that defines four main areas effecting the organizational buying process. These are the interactive process between the buyer and the seller, the environment, the participants and the atmosphere. The complex and contingent changes in these areas affect the process and the result of the decisions.

By taking internationalization of the industrial markets into consideration, Samli et al. (1988) makes a critical review of the Sheth, Webster and Wind and Reward/Masurement models. After that they propose the dimensions that are expected to affect the international industrial buying process and develop an index (IIBBCI, International Industrial Buyer Behavior Composite Index) for industrial marketers so that they can segment world markets depending on their factor scores on index criteria. This segmentation assists to a better match of products and services with international markets and the improvement of the marketing strategy.

As Johnston and Lewin (1996) states, the Sheth Model or Webster and Wind Model are generic models where the framework was developed to fit all types of organizational decision making processes and thus ignore product, service, situation, organization or individual specific factors that may cause or generate different dimensions within the process.

The industrial buying process related with the logistics center service is a very complex and specific one that needs special attention in terms of its dimensions and variables. As an addition to the main aim of this study, the impact of certain variables on the buying decision of LSPs of logistics center services will be explored. The determinants in the Webster and Wind (1972b) model will be analyzed to see if

they explain the variance in the final industrial service buying decisions of LSPs from a logistics center.

### **2.3. CONCLUDING INDUSTRIAL MARKETS, INDUSTRIAL SERVICES AND ORGANIZATIONAL BUYING PROCESS: PROPOSITIONS FOR LOGISTICS CENTERS**

Understanding the service concept is an essential activity which constitutes valuable knowledge and acts as an input to the new service development process (Goldstein et al., 2002). As the research interest of this study is logistics center services design, it is essential to evaluate the market offering of these facilities with a service point of view. What the logistics center offers to its customers is actually a bundle of tangibles like buildings, offices, vehicles and infrastructure. However, the logistics center organization delivers the usage rights of these utilities and supports this usage right with certain services like maintenance, ICT services or consulting. As a result, the final market offering is a highly complex concept which can be customized for every different user.

In order to name this market offering as a service, firstly, its interaction with services' generally accepted IHIP (Zeithaml et al., 1985; Kotler and Armstrong, 2008; Lovelock and Wirtz, 2011) characteristics should be explored. Cooper and Jackson (1988) add two more items to these as specialization and technology which are specific for industrial services. A logistics center's market offering has a hybrid nature in terms of tangibility. It has very concrete elements like physical inventory, warehouses, cranes, facilities and the like. The intangible nature of the logistics service is related with its ability to deliver and therefore secure the availability of products and services in the market (Hutt and Speh, 2010). The logistics center offers an incremental value that facilitates this ability of its residents. So the market offering is actually an intangible skill that is enabled through geographic proximity and synergy plus the usage of common tangibles.

The heterogeneity principle related with a logistics center is a very strong argument due to the complex solution that it provides to every potential industrial customer that decides to become a resident in this facility. As Boyt and Harvey

(1997) put it, the various industrial market segments all require different service packages. So it is not feasible to create generic service packages to all market segments. Services should be positioned according to the needs of the specific segment after an internal analysis, market analysis and a competitive analysis (Lovelock, 1983). The logistics center organization designs, offers and customizes its offerings according to the needs of its different industrial customers.

When it comes to inseparability, the service literature defends that the service production process is handled by the customer and the supplier together. Sometimes the customer may even serve himself or herself (self-service restaurants), or at least cooperate with the service provider in order to receive the service (hospitals or universities) (Lovelock and Wirtz, 2011). When the logistics center services are considered, actually the industrial customer is always there when the real estate is being developed or when the freight is moved through common infrastructure. The industrial customer co-creates the value (Vargo and Lusch, 2004a) together with the logistics center service producer by demanding a specific solution, tailoring it, specifying its performance indicators, or transferring final demand knowledge from its own market sources, i.e. second-tier customers.

Perishability refers to the fact that, although the capacity for service production like the vessel space, warehouse operators or empty containers can be held ready for any customer demand, the logistics center service itself is not able to be stocked prior to customer demand. A customer has to make a specific request for the service to be produced and that service is either consumed at the time of production or wasted. Vargo and Lusch (2004b) dispels this myth by defending that many products are also perishable, lose their value and are wasted in time. In addition to that, they claim that many services have long-term benefits. The long lasting benefits of logistics center services are competitive advantage in the market through cost reduction, stable or increasing market share and profits for the organization who buys these services.

With reference to the other characteristics specific to industrial services, logistics centers incur a high degree of specialization as they are concentrated areas where companies related with logistics industry are agglomerated. This results in a high degree of specialization in different logistics activities. The industrial services

of a logistics center should be supported with the usage of up-to-date transportation and information technology in order to achieve service production efficiencies inside the facilities.

As a result of this evaluation, it can be stated that IHIP characteristics which are still subject to long debates in the services marketing literature, are partly applicable for logistics center services as well. But as the main theoretical lenses in this study are relationship marketing and industrial network approach, it is essential to perceive the relationships as the main focus of exchange not the products (/services). So the study does not make an effort to standardize the services of logistics centers and offer a generic marketing program for them. Rather, the main effort is for tangibilization (Levitt, 1981) of logistics center services which have high credence properties and combining them with the customer expectations.

There are certain efforts to draw maps of major products and services on tangibility continuums (Rathmell, 1966; Shostack, 1977). However, the new economy and the dynamic structure of the markets result in various combinations of goods and services that are forming complex solutions. Restaurants are among hybrid producers as they provide tangible and intangible components together in their market market offering. Logistics centers are similar to self-service restaurants except that the collective value creation inside is not for final consumption but it is for further sales to other industrial customers. Also they are restaurants that open the kitchen facilities to the self-serving customer in order to enable them produce their own food. They are only responsible for making these facilities available, fully working and supporting the production process through them. If Vargo and Lusch's (2004a: 2) definition for services is accepted, then logistics centers apply specialized competences, knowledge and skills for the benefit of their residents and they use the infrastructure, buildings, vehicles, computers inside the facility in order to deliver these competences. This definition underlines the service-dominant logic in a logistics center.

Looking at the logistics center's market offering with a service dominant logic should also be supported with this philosophy's fundamental premises. SDL accepts service as the fundamental basis of exchange. In a logistics center, the entity that is being exchanged is the set of knowledge, market competence, expertise,

synergy in order to perform better together. This exchange is not only between the logistics center organization and the residents but also among the residents. However, this study does not accept service solely as a basis for exchange but combines it together with relationships among the complex logistics center network's actors. This is also inline with another premise of SDL stating that "a service-centered view is inherently customer oriented and relational."

SDL also states that the customer is always a co-creator of value. A logistics center organization can benefit from the potential customers' knowledge and skills especially during the industrial service design and development processes. So the customers are involved in the value generation process by logistics center services. In addition to this premise, one of the fundamental reasons for logistics related companies clustering in a specified area under the management of a single organization is to use common resources in order to deliver higher value to their customers. This is achieved by integrating the individual resources (SDL's 9th premise) of independent companies and the logistics center organization to provide superior logistics value. These may be operand resources like the physical assets or objects in the logistics center area or operant resources like market knowledge, logistics skills, synergy capacity, consulting support or other supplementary services. The logistics center organization is the systems integrator (Davies, 2003) of all these resources through the help of its facilities.

In order to define this system integrator as an industrial service provider, it is essential to define its customers. As Webster (1991) puts it, the industrial markets are mainly defined by the characteristics of the customers transacting in these markets rather than the products. The customers of a logistics center organization are mainly the LSPs, the warehouse operators, transportation operators, retailers, banks, restaurants, hotels and certain public institutions like the customs, associations or universities. These actors produce services for the facilitation of production of goods and services (Marrian, 1968) and effective supply chain flows through the center. So they are not the final consumers but are service providers for industrial customers. There is a high degree of interdependence between the potential residents of a logistics center and the logistics center organization. Additionally, the organizational

service buying process from the logistics centers is a complex process (Webster, 1978).

Due to this complex buying process, the logistics center services may be classified under intricate services with their low replacement rate, high essentiality, complexity and credence properties (Boyt and Harvey, 1997). They can also be classified as SSCN because they support the logistics center's customers' network actors (Cova and Salle, 2008). They can also be called as end-user process oriented and relationship-based services (Oliva and Kallenberg, 2003) as they focus on logistics processes and are based on relationships within their complex network. As a result what they produce is an integrated solution which is a combination of goods and services and they solve the logistics center's customers' complex problems (Wise and Baumgartner, 1999).

Stremersch et al. (2001: 2) define a full service as "a comprehensive bundle of products and/or services, that fully satisfies the needs and wants of a customer related to a specific event or problem" and link it with systems selling or bundling concepts. The logistics center services can be considered as a full service within this framework. As a result of their study, they find out that the industrial buying behavior of full services (Stremersch et al., 2001: 2):

- carry new task characteristics as a buy class;
- their dollar value is higher than individual services;
- are highly complex in nature;
- have contracts with long time commitment;
- have long decision making processes.

As already mentioned, the organizational buying process is highly complex due to the nature of this industrial service. So the main factors that are affecting the organizational buying process are necessary inputs in order to forecast the organizational buying propensity from a logistics center. Prioritization of these factors would allow the logistics center organization to consider managing the marketing process with a different perspective. This would lead the logistics center organization in exploring the variables influencing complex service sourcing (Nordin and Agndal, 2008) and allow them to position their marketing processes with an SDL focus (Lindberg and Nordin, 2008).

In this respect, the logistics center organization is defined as an industrial service organization which is evaluated with a SDL. The organizational service buying from logistics centers can be considered as a new task for potential customers. The variables that are included in Webster and Wind (1972b) Model are chosen for measuring their impact on the final decision in buying logistics center services or investing in the logistics center. A summary of these theories and the related propositions are listed on Table 6.

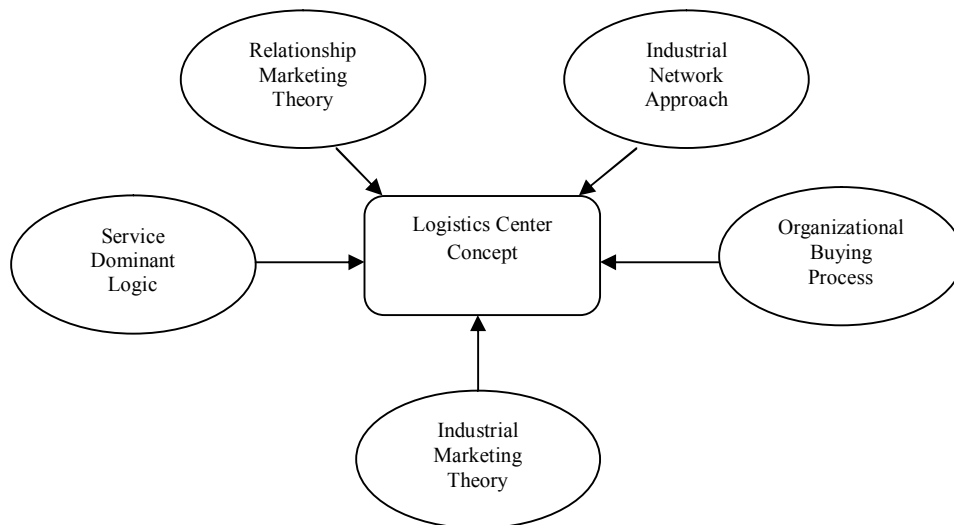
**Table 6.** Summary and Propositions regarding Industrial Services

| <b>School of Thought</b>             | <b>Primary Scholars</b>                                                                            | <b>Focus</b>                                                                                                                                                                                                                                                               | <b>Propositions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Industrial Services Marketing</b> | Oliva and Kallenberg, 2003; Wynstra et al., 2006; Homburg and Garbe, 1999; Stremersch et al., 2001 | <ul style="list-style-type: none"> <li>-The transactions in industrial markets take place between enterprises.</li> <li>-Industrial services are service transactions between enterprises</li> <li>-Complex services or full services</li> </ul>                           | <ul style="list-style-type: none"> <li>-As the transaction between a logistics center organization and its buyers is an inter-organizational transaction, the service bought from a logistics center is classified as an industrial service.</li> <li>-The logistics center services are highly heterogeneous, highly inseparable, hybrid in terms of tangibility and vague in terms of perishability</li> <li>-The logistics center's services (1) carry new task characteristics as a buy class; (2) their dollar value is higher than individual services; (3) are highly complex in nature; (4) have contracts with long time commitment; (5) have long decision making processes.</li> </ul> |
| <b>Service Dominant Logic</b>        | Vargo and Lusch, 2004a; 2004b                                                                      | <ul style="list-style-type: none"> <li>-Service is the fundamental basis of exchange</li> <li>-A service-centered view is inherently customer oriented and relational</li> <li>-Customer is a co-creator of value</li> <li>-All actors are resource integrators</li> </ul> | <ul style="list-style-type: none"> <li>-In a logistics center the service is combined with relationships between the logistics center organization and the residents and this combination forms the fundamental basis of exchange.</li> <li>-All residents are integrating their resources in order to join the value creation process in a logistics center.</li> <li>-A customer oriented view is essential in logistics center service design.</li> </ul>                                                                                                                                                                                                                                      |
| <b>Organizational Buying Process</b> | Sheth, 1973; Webster and Wind, 1972a; 1972b                                                        | <ul style="list-style-type: none"> <li>-Factors affecting organizational buying process</li> </ul>                                                                                                                                                                         | <ul style="list-style-type: none"> <li>-Environmental, organizational, buying-center specific and individual factors affect the organizational buying process of logistics center services.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

These theories and approaches that have been evaluated until this part, constitute the theoretical lense of this study. The theoretical reasoning in this study is abductive reasoning and as menitoned in the introduction part this reasoning is generally supported by a research approach which is named as ‘systematic combining’ (Dubois and Gadde, 2002: 554) or ‘theory matching’ (Spens and Kovacs, 2006: 377). In this type of reasoning, the researcher decides to approach reality with alternative theories (Spens and Kovacs, 2006) and tries to explain it from different perspectives.

Until this part, relationship marketing theory, industrial network approach, service-dominant logic, industrial marketing theory with a service approach and organizational buying process approaches are explored. These are all evaluated in order to match the theory with logistics center reality as Figure 12 represents.

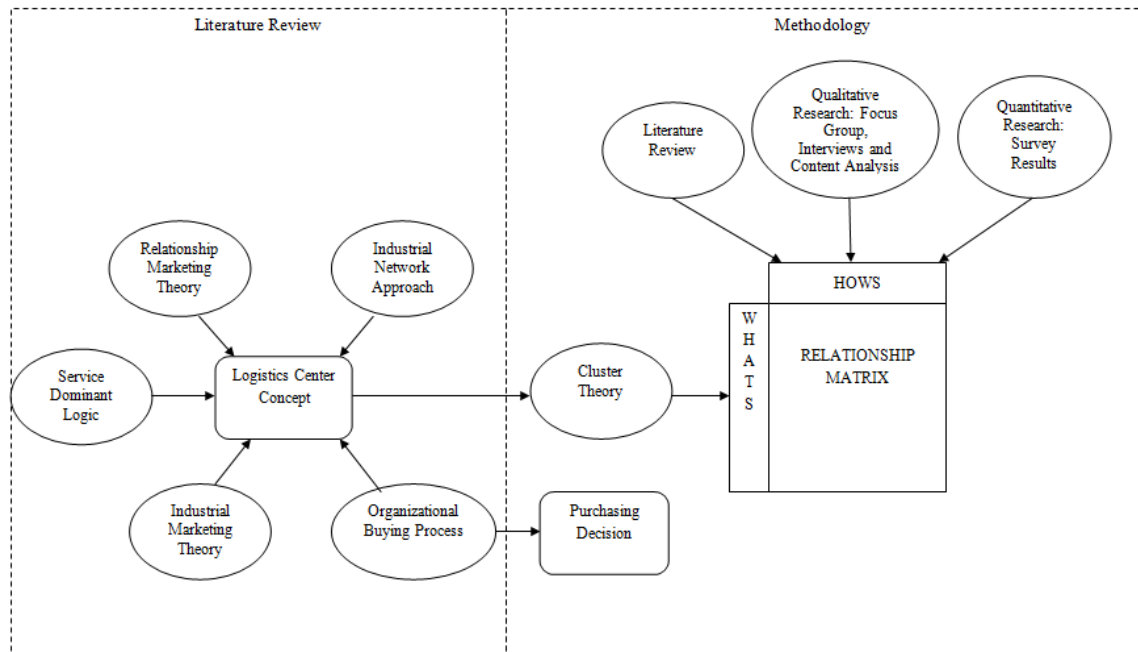
**Figure 12.** Initial Theoretical Framework



However, these theoretical approaches explain the logistics center concept from a broader perspective. In order to make an effort to develop the industrial service model in a logistics center, the customer expectations and the product/service characteristics in a logistics center should be operationalized. For achieving this aim, a mediating theory, cluster theory, which is highly interdisciplinary and which explores the geographically concentrated industrial networks is also included in the theoretical framework. Cluster theory is used to operationalize the customers

expectations from a logistics center. The conceptualization efforts for logistics centers and triangulated research tools are used to explore and refine the product/service characteristics. The combination of these provide the output for the prioritized characteristics of industrial service design in a logistics center. The revised research model in this respect is represented on Figure 13.

**Figure 13.** General Theoretical Framework



According to the research model, the logistics center concept is evaluated from relationship marketing theory's and industrial network approach's theoretical lenses with a service dominant logic that accepts the logistics center's market offering as an industrial service. Within this framework, the factors affecting organizational buying process are hypothesized to affect the industrial service buying decision from a logistics center.

This theoretical lense is operationalized through a mediating theory which is cluster theory. The determinants of logistics clustering are explored through a literature review and the logistics center reality is tried to be conceptualized. The inputs from the determinants formulate the customer expectations from a logistics center which also constitute the WHATs for the house of quality. The inputs from the

literature review, qualitative and quantitative research constitute the HOWs for the house of quality. The relationship matrix will translate the customer expectations into service design and lead the way for prioritized service characteristics. In order to achieve these aims, the following section explores the logistics centers as a cluster and the logistics center concept with its essential components.

## SECTION III

### LOGISTICS CLUSTERS AND LOGISTICS CENTERS: A CONCEPTUAL FRAMEWORK

#### 3.1. A REVIEW OF LOGISTICS OUTSOURCING

Unlike the conventional vertically integrated company structure, that aims to conduct all operations in-house, today's companies tend to outsource certain functions including logistics (Rabinovich, et al., 1999) in order to focus on their core competencies (van Damme and van Amstel, 1996). Logistics outsourcing is generally used in the same meaning with third party logistics (3PL) or contract logistics which means to outsource any logistics activity or the whole logistics processes that was previously performed in-house to an external company (Lieb et al., 1993). However, as Skjoett-Larsen (2000) emphasizes, due to the long-term relation based perspective of business management in North Europe and Scandinavia, 3PL is defined as a logistics alliance between business partners who collaboratively design and tailor logistics services for the benefit of this long term business relationship (Bagchi and Virum, 1996).

Due to the variety of logistics functions within a firm, it is a difficult task to define and describe the logistics outsourcing process in concrete lines. Rao and Young (1994:18-19) classify five main factors influencing company logistics outsourcing decisions:

(1) *centrality of the logistics functions to the firm's core competency*: they suggest that as a specific logistics function, like production planning for example, is closer to the firm's core activities, it will hardly be outsourced.

(2) *risk liability and control*: a firm may want to keep the control at own hands when the commodity subject to logistics outsourcing has special service requirements like hazardous materials or materials susceptible to damage.

(3) *cost/service tradeoffs in operations*: the lower the cost of the logistics function when it is outsourced, the more likely that it will be outsourced

(4) *information and communications systems*: the requirement of seamless integration in global logistics operations is supplied through information technology outsourcing

(5) *market relationships*: the opportunity for shippers to enlarge the market network and reach valuable market information through logistics outsourcing

They also state that these factors are influenced by network, process and product complexity of a company's operating structure (Rao and Young, 1994). In the extended supply chains of today's global production networks, the complexity of these three factors keep increasing and the requirement of logistics outsourcing is therefore diversified.

There are many studies concentrating on the logistics outsourcing practices of companies located on certain parts of the world like the USA (La Londe and Maltz, 1992), Europe (Virum, 1993; Wilding and Juriado, 2004), China (Hong et al., 2004), UK (Jaafar and Rafiq, 2005), Australia (Dapiran et al., 1996) and India (Sahay and Mohan, 2006).

Muller (1993; cited by Bourlakis and Melewar, 2011) classifies logistics service providers into four main groups:

(1) Asset-based vendors. These companies offer logistics services through their physical assets like warehouses, trucks, vessels and such.

(2) Management-based vendors. These companies do not own physical logistics assets. They provide integrated logistics system management services through information infrastructure or traffic management operations.

(3) Integrated vendors. These companies provide services through both their physical assets and also they rent services from other vendors as well in order to run their clients' logistics operations.

(4) Administration-based vendors. These companies generally only provide administrative services like freight payment.

As Razzaque and Sheng (1998) state logistics functions, which used to have a low priority when compared with manufacturing operations of the firm, are now transformed into tailored solutions offered by 3PL providers for sustainable competitive advantage. The evolution of logistics outsourcing continues towards a more complicated structure like logistics alliances (Bagchi and Virum, 1996).

Rabinovich et al. (1999) state that firms tend to outsource certain clusters of logistics functions in order to utilize the advantage of integration in these functional systems. Consequently they propose that, transactional logistics functions like transportation or warehousing should be outsourced together. Information intensive functions like inventory management, order processing and information technologies should be outsourced together.

In addition to these requirements, the demand for extensively customized logistics solutions to a large group of integrated logistics functions, force 3PL providers to become leading solution providers who also run multiple distinct relationships with second tier logistics service providers for their customers (Berglund et al., 1999). The term Fourth Party Logistics (4PL) Service Provider was introduced in 1996 by Accenture Inc. for logistics companies that were required by US customers whose logistics outsourcing needs were not been satisfied enough by existing 3PLs (Bedeman and Gattorna, 2003). 4PL service providers are defined as supply chain orchestrators (Evangelista et al., 2009) that coordinate various 3PLs and other service providers for a comprehensive design and management of logistics systems and supply chains operations of their customers. They are generally not asset based but act upon high level information technology infrastructure and Internet (Viswanadham and Gaonkar, 2003).

Today, with the changing demand of logistics outsourcing and increased speed and flexibility requirements of global supply chains, logistics outsourcing keeps evolving towards a more integrated structure with all players in the industry. One-stop-shops fully integrated with ports and terminals are new solutions to the logistics service customers worldwide. A recent development in this direction is the introduction of logistics centers in various parts of the world. Logistics centers are a new form of logistics outsourcing and they are a new type of industrial service that responds to macro and micro logistics needs of the LSPs, their customers and their stakeholders.

This section explores and analyzes the establishment, evolution and different examples of logistics centers. The section makes an effort to integrate the theoretical framework which was explored in the previous sections with cluster theory and operationalize the logistics center concept. In addition, the section explores the

important components of the logistics centers, their position among other logistics clusters and seaports, facility location decisions, ownership structures and the main determinants that cause different industrial customers locate in the same place called the logistics center.

### **3.2. CLUSTER THEORY**

Like the high technology companies located in Silicon Valley, entertainment business located in Los Angeles or watch industry around Geneva, production of certain industries tend to cluster around certain geographical locations. Traditional approaches to these clustering efforts explain the concept with lowered costs due to the higher combined volume. However, these geographical concentrations also have a social aspect in terms of social networking benefits like being close to information resources regarding market niches and new opportunities within the industry and being close to the resources that would be necessary while building an organization (Sorenson, 2003). This geographic agglomeration effort is named as a cluster and cluster theory has been discussed in the literature from various perspectives.

According to Porter (1998), who himself also initiated a school of thought on clusters with a business strategy perspective, antecedents of cluster formation can be traced back to Alfred Marshall's (1890/1920) book chapter related with the externalities of specialized industrial locations. This perspective on cluster theory is referred to as the economic geography school of thought. Since then, different perspectives are developed with respect to the enterprise agglomeration at specific locations.

#### **3.2.1. Main Schools of Cluster Theory**

Meijboom and Rongen (1995) review the existing approaches to cluster formation in spatial economics research and group them under three main perspectives: (1) economic geography, (2) organizational concepts and (3) business strategy. Economic geography perspective takes a macro point of view to the firm's physical and functional environment. The firms at a specific point may gather there

even accidentally or due to historical reasons, but the growth of this cluster depends on the economies of scale achieved due to being located in this cluster (Krugman, 1991). However, moving an existing facility to a cluster location is costly and these costs should be compensated with promoted land prices and thus lower investment costs at new clusters (Rauch, 1993). So economic geography approach defends the spatial equilibrium of forces that are proponents and/or opponents of clustering while explaining the agglomeration of companies in a specific location. Sengpiehl (2010) groups this school under Neo-Classic economic theory by deriving from other theoretical reviews and lists its determinants as advantages due to labor pooling, decreased costs due to supplier specialization and knowledge spillovers due to physical proximity.

The second school depends on the views of Scott (1986) who borrows the school's main thoughts from transaction cost economics theory (Williamson, 1981). Throughout the transition to the new economy, firms tend to focus on their core competencies and outsource majority of activities which were handled inside before. These outsourced activities used to form the internal transactions of an enterprise. However, due to this vertical disintegration, they become external transactions and the number of a firm's external transactions increase as the extent of outsourcing increases. Thus, firms try to lower the cost of these transactions by positioning themselves close to each other. So even they are vertically disintegrated, they are spatially linked in clusters. Harrison (1992) contributes to this school with a social economy perspective and states that social relations, trust and factor exchange between companies incur the formation of clusters.

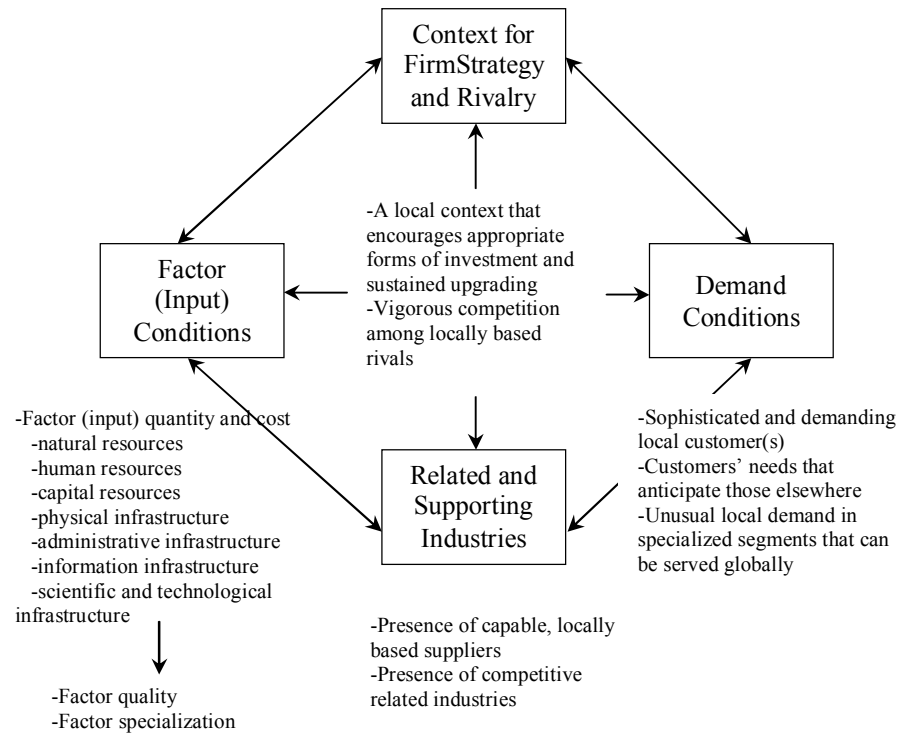
De Langen (2004) names this school of thought as the industrial district school. Becattini (2004: 19) defines the industrial district as a "socioterritorial entity which is characterised by the active presence of both a community of people and a population of firms in one naturally and historically bounded area". In the district – and unlike in other environments, such as the manufacturing town – the community and the firms tend, as if it were, to merge. The school evaluates the organizational characteristics of local production clusters where majority of the companies are composed of SMEs. These SMEs are embedded in a community where they specialize in different aspects of production (Piore and Sabel, 1984). Within these

industrial districts, trust, social embeddedness, the shared culture and organization learning are important points.

The third school depends on the views of Michael Porter (1990). Porter (1998: 213) defines clusters as “geographic concentrations of interconnected companies, specialized suppliers, services providers, firms in related industries and associated institutions (for example universities, standards agencies and trade associations) in particular fields that compete but also cooperate”. The school bases its ideas on Porter’s Diamond Framework on Figure 14 which represents the four mutually reinforcing sources of competitive advantage.

The factor inputs are composed of both tangible and intangible factors of production. Although some of the factors are mobile, there is a certain part which is specific to a region. In order to achieve competitiveness within the cluster, these factors should be improved in terms of quality and specialization. Porter emphasizes the importance of specialized factors like innovation capability or knowledge sources specific to a location (like a patent right or know-how of research and development institutions within the cluster) for sustained competitiveness.

**Figure 14.** Sources of Locational Competitive Advantage



Source: Porter, 2000: 20.

Firm strategy and rivalry refers to the rules, intensity and the governance of rivalry within the cluster and is one of the strongest determinants of a cluster. According to Porter, local rivalry is highly influential on the productivity of a cluster because if the rivalry is imposed from a distant market, the flaws in the local production may be compensated with the longer distance of the competitor. However, a strong local rivalry would reinforce the companies in the cluster to innovate, to reduce their costs and increase the quality of production. Clusters also shift the focus of local rivalry from lower total cost or possession of physical assets to innovation potential and specialized skill generation.

Demand factors are important determinants in terms of achieving economies of scale and encouraging new firms to invest in the cluster. However, these outcomes are related with the size of the demand markets. In addition to these, Porter argues that the sophistication of local demand stimulates the level of quality and innovation potential of clusters. This sophisticated demand may also lead the way for the cluster

to serve global markets in different segments as well so it serves as an essential knowledge source.

The last factor is the existence of related and supporting industries. These are evaluated from vertical and horizontal perspectives. The vertical perspective focuses on the existence of competitive suppliers that support the production processes. The horizontal perspective focuses on the presence of companies that produce the same products or services. The presence of these companies would decrease the costs due to shared capacity or motivate innovations due to pressure of rivalry.

There are various impacts of clusters on competitiveness (Porter, 1998). Clusters provide better access to labor markets, supplier markets, institutions, public goods and specialized information and this increases the productivity of individual companies within the cluster. They also generate complementarities by supporting each other on better performing parts. Local rivalry inside fosters constructive competition in terms of increased quality and innovation. Companies inside a cluster gain a better understanding of market needs when compared with isolated enterprises. Clusters also attract new business due to the established supplier-market relations, available factors of production and positive feedback.

According to Sengpielh (2010) Porter borrows from neo-classical economic school with his focus on factors of production and productivity concerns. He also borrows from organizational school dynamics by referring to social factors that foster innovation and entrepreneurship. However his theory has been criticized by different scholars in terms of its vagueness, the simplicity of its explanation (Martin and Sunley, 2003), lack of focus regarding industry-specific conditions (Kitson et al., 2004) and lack of longitudinal dynamic analysis on cluster formation (Motoyama, 2008).

**Table 7.** Summary of Cluster Schools

| <b>School of Thought</b>                                  | <b>Primary Scholars</b>                         | <b>Focus</b>                                                                                                                                           |
|-----------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Economic Geography / Neo-Classical Economic Theory</b> | Krugman (1991); Rauch (1993)                    | -economies of scale in factors of production<br>-lowered costs due to shared sources<br>-knowledge spillovers due to proximity<br>-spatial equilibrium |
| <b>Organizational Context / Industrial Districts</b>      | Scott (1985); Harrison (1992); Becattini (2004) | -vertical disintegration and increased external transactions<br>-social embeddedness, mutual relationships<br>-trust                                   |
| <b>Business Strategy</b>                                  | Porter (1990)                                   | -diamond model determinants                                                                                                                            |

The basic schools of thought related with geographic concentration of enterprises and institutions are summarized above on Table 7. There are other smaller approaches as well, like population ecology school, neo-Schumpeterian and evolutionary economics school, new endogeneous growth theory and economics of firm strategy and Marshallian localization economics school (Sengpiehl, 2010). However, they are generally focusing on a smaller part of the three broader schools. The basic theoretical approach for this study is derived from the three main schools of thought.

### **3.2.2. Clusters and Logistics**

According to Porter (1998) in order to identify a cluster, first a large firm or a collection of similar firms should be chosen. Then the upstream and downstream vertical collaboration between this firm and others should be specified. The next step is to identify the horizontal industries or enterprises that are using the same channels and producing either complementary or similar products and services. After that, the institutions that provide know-how, special skills, technology, information or capital to the cluster should be determined. The final step is to define the governmental bodies that regulate or influence the participants in the cluster. However, their boundaries are hard to determine as they keep evolving due to new entrants but the best criteria to be used in drawing the borders of a cluster may be the extent of knowledge spillovers and their importance for productivity and innovation (Porter, 2000).

Since mid 1980s, logistics service providers position themselves in clusters across Europe increasingly (Meijboom and Rongen, 1995). Companies that compete with each other in terms of the services they sell and their target markets, tend to locate facilities in areas called logistics centers in order to achieve cost advantages and synergy potentials. This is also called logistics agglomeration. International Logistics and Supply Chain Management Association in Australia defines the logistics agglomeration approaches as dense trade clusters (DTCs). They propose that there are four different levels of DTCs out of which the first three are essential parts in order to constitute the latest one: freight villages, inland ports, freight hubs and logistics cities (Sengpiehl, 2010).

The idea behind clustering business activities that are dealing in the same industry is to achieve a progress in the competitiveness of individual companies (Labanauskas and Palsaitis, 2007; De Souza et al., 2007). This is aimed to be achieved through economies of scale due to the increased volume, de-bureaucratization and shared risk (Meidute, 2005a). For instance, the common usage of logistics center infrastructure and equipment provides the residents an alternative that would cause them undertake large investments and significant risks if they had to build the facilities themselves for individual use (Tsamboulas and Kapros, 2003).

However, enhanced competitiveness does not happen automatically when companies gather in a cluster (De Souza et al, 2007). This cluster should be supported with public investment that would facilitate the successful functioning of combined operations (Tsamboulas and Kapros, 2003) and the logistics cluster should be located strategically with shared proximity to resources and/or markets (Nathanail, 2007).

According to the study of Ng and Gujar (2009) the industrial agglomeration and transportation hub development are highly dependent on each other. Existing transportation facilities facilitate the flow between the various stakeholders of industries such as suppliers, manufacturers, subcontractors or service providers and thus attract such facilities close to themselves. This agglomerated economy either results in a decrease in singular company costs and/or in an increase of its revenues.

Inland nodes also are very important in redesigning or influencing the existing network of transport chains (Notteboom and Rodrigue, 2005). By offering

extended services and clustering to form one-stop-shops for hinterland customers, inland ports execute influence on traditional geographical transport corridors and thus they contribute to the competitiveness of the seaports that they are linked with.

Understanding this rationale behind the industrial clusters may influence the public policy that generally tries to replicate the successful agglomeration examples in the world. In order to do this, policy makers undertake huge investments in terms of infrastructure and land development. In order to encourage more demand to these investments, successful examples of private initiatives can be promoted. If such pioneer companies are enjoying both geographical and social networking benefits of a specific industrial cluster, it would fertilize further development of the area in a higher pace (Sorenson, 2003). This could remove the traditional hesitation of locating close to rivals among private companies and utilize the benefits of this proximity instead. This proposition is also inline with Porter's (2000) statement that a cluster would attract new business more than an isolated area.

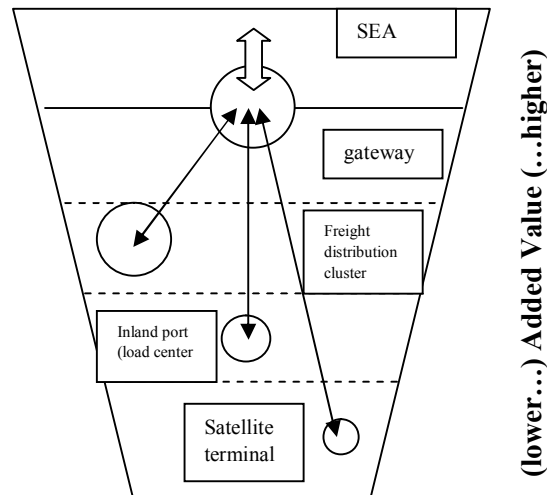
### **3.2.3.The Evolution of Logistics Clusters**

As already discussed in the logistics trends section, the logistics industry has been passing through various challenges and transformations. Lowered trade barriers, globalization of sourcing and production, developments in transportation technology, increasing impact of information and communication technologies and changing business processes are among the factors that transform logistics industry (Rimienne and Grundey, 2007; Notteboom and Rodrigue, 2006).

These factors and their impact on logistics industry, made an important influence on logistics node progressions. Clusters were easily adopted by the logistics industry due to the existing familiarity in the sector related with the nature of logistics business and integrated supply chain relations (Elbert et al., 2011: 513). However, a logistics node may not be established as a full service area. They tend to show a technical and physical expansion in terms of scope hierarchies. Inland terminals have always existed but within time they started to polarize together with other logistical activities due to their locations on supply chains and thus became a

part of logistics clusters. Notteboom and Rodrigue (2009) schematizes this evolution as seen on Figure 15.

**Figure 15.** The Evolution of Logistics Clusters

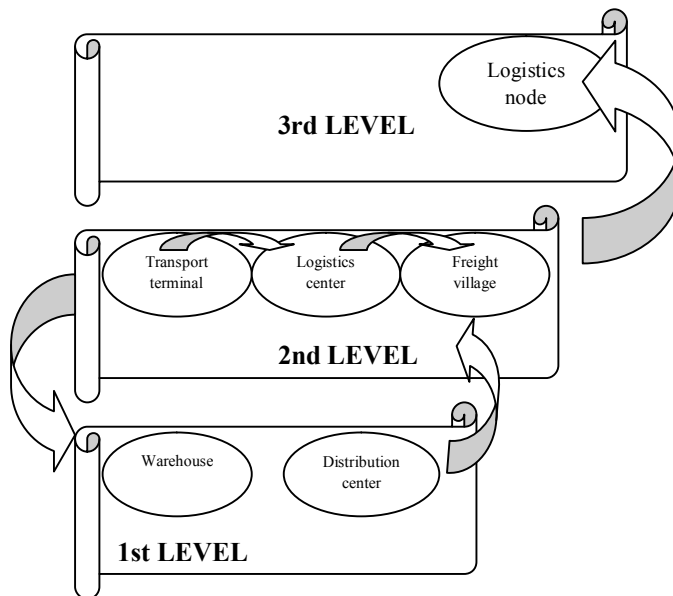


Source: Notteboom and Rodrigue, 2009: 9

Here the satellite terminals are close transloading areas that aim to reduce congestion in main gateways. Inland ports are intermodal terminals acting as load centers. Freight distribution clusters combine intermodal terminals and logistics services and execute the distribution function to a wide consumption market. Logistics centers are in this group of facilities. Gateways are major interface facilities between sea and land and they contain a wide range of operations in terms of transportation, logistics or support services (Notteboom and Rodrigue, 2009).

UNESCAP (2006) evaluates the evolution of dry ports in four phases. These inland nodes were container freight stations in the beginning. After that, combined with stuffing services, they were transformed to inland container depots. Value added logistics services and various warehousing activities were established in these nodes at the third phase. At the last phase of the evolution, manufacturing facilities and free trade zones were accumulated in the same area to form a complicated logistics agglomeration.

**Figure 16.** Logistics Facilities Hierarchy



Source: Rimiene and Grundey, 2007: 89

Rimiene and Grundey's (2007) logistics facilities hierarchy (Figure 16) states that the first level of logistics nodes are composed of warehouses and distribution centers. At the second level there are transport terminals or logistics centers and the third level is composed of logistics nodes. These logistics nodes are gateways for Notteboom and Rodrigue (2009), logistics cities for Sengpiehl (2010). They are the highest level of logistics activity concentration.

In the USA, the logistics clustering process was a natural one, considering the land availability and highly utilized railroad transportation. Opposing to the European public private partnerships that are developing and managing these clusters, solely private initiatives are much frequently observed in America. Notteboom and Rodrigue (2009) introduce three different forms of logistics clusters in North America: clusters near gateways like Los Angeles, clusters around strong inland rail terminals, clusters around busy highways connecting crowded areas of consumption. These inland terminals generally assist containerized trade by repositioning empty containers to markets offering cargo, by cargo rotation from emptied imports boxes to refilled exports boxes and by supporting trade for small scale enterprises through shared synergies.

Prozzi et al. (2002) uses marketing management theory's product life cycle stages in order to analyze inland port development processes. They state that inland nodes go through preparation, establishment, expansion, stabilization and decline stages like other products or services. This decline may be avoided through networking with other inland nodes. According to Notteboom and Rodrigue (2006) the interaction between seaports, inland ports and industrial customers create logistics intensive networks located within a large logistics zone. The process may be market-driven and initiated with market demand but it is also supported by public authorities as well so as to facilitate economic development.

#### **3.2.4. The Determinants of Logistics Clusters**

Following Porter's (1998) cluster definition, Elbert et al. (2011: 516) define logistics clusters as "concentrations of logistics companies, specialized suppliers for logistics companies, logistics service providers, firms in logistics intensive industries as well as public and private institutions related to logistics, which can compete and co-operate with one another".

Logistics companies generally tend to position themselves close to each other in order to benefit from the advantages of proximity. This creates a zone that can utilize from synergies and economies of scale. This zone needs either one or more than one corridors opening to major seaports in order to reach international transportation networks. As a result the establishment of geographically concentrated logistics zones is a slow and market-driven process which is also sourced by the interaction between seaports and inland terminals. Naturally, this evolution is also supported by public authorities through several incentives due to its economic and social development opportunities (Notteboom and Rodrigue, 2009).

Sengpiehl (2010) finds out that all the exemplary logistics cities he analyzes have at least two more common properties. All of them also include social and educational facilities that would enhance the positive impacts of clustering and all of them are part of the economic development strategies of national governments so they are supported with public action.

According to Ng and Gujar (2009) centrality and intermediacy are two important factors in the development of a transport hub. Centrality is not only geographical but also related with the size of the market and its potential. Intermediacy is related with a spatial location between two demand or supply points in the transport system. Today these two criteria are employed in combination through the development of hubs. Examples are the dry port locations in the USA which were close to production sites fifty years ago due to their centrality potentials. Today these dry ports select locations in between production zones and maritime gateways where they are close to intermodal transport infrastructure and various logistics services (Hesse and Rodrigue, 2004).

Ozdemir (2010: 155), collects the characteristics required for the success of logistics centers which were previously offered by Rimiene and Grundey (2007), Rodrigue et al., (2006) and EEIG (2004) under four main headings. These are (1) geographical/location factors, (2) economic agglomeration, presence of clusters of manufacturing and services, and hinterland size, (3) infrastructural requirements; and (4) accessibility and transportation.

The possible benefits that could be secured through cooperation within a logistics center are summarized by Jarzemskis (2007):

- Intermodality benefit: Better transportation performance through the optimized utilization of combined modes would incur benefits for shippers, forwarders and terminal operators. Due to the increased volume and lowered costs the frequency of schedules would also increase and thus facilitate shipper satisfaction from such a facility.
- Forwarders impact: Due to their direct contact with the customers, the existence of forwarders within a logistics center and the feedback from them would increase the flexibility of the center.
- IT Solutions: Shared IT infrastructure and solutions offered to small and medium sized logistics companies would remove the financial burden of such investment from their shoulders and support to their individual service quality.

- New transport flows due to synergy: The quality service offered by the logistics center as a whole would attract new orders to be received by different service providers located inside.
- Supply chain management: The increased service quality of the individual inhabitants would secure their position on global supply chains as they improve their capabilities in terms of professional supply chain activities.
- Additional services: Besides the logistics services in the center, additional services like customs, banks, repair and maintenance or research and development would attract new entrepreneurs to the area.
- Cost sharing: Common infrastructure and services offered to single users would let the high costs to be shared by many companies. So reaching these service opportunities becomes easier for small scale firms whom would not be able to achieve such an undertaking if they needed to do it themselves.
- Economies of scale: This benefit rises due to the increased volume that flows through the logistics center and its business generating potential.
- Quality: Depending on the service that the customers receive from the companies located in the logistics center, the overall organization could be perceived as a quality mark in the business of logistics.
- Know-how: Shared knowledge and capabilities in a logistics center would facilitate a know-how spillover among the members.
- Joint marketing: Due to the one-stop-shop effect, the companies in a logistics center can unite their competencies in different logistics activities and engage in joint marketing operations.

Logistics centers act as a value generator as well together with the value added logistics services that they produce. These services they offer may be in accordance with the logistics service providers' network structure and specialized areas in order to increase collaboration efficiencies. With the help of this support in

the total value generation efforts of any supply chain, logistics centers contribute to the competitiveness of the overall chain (Eckhardt and Rantala, 2012) and increase the flexibility and responsiveness in the long run (Elbert et al., 2011).

In general, the ability to adapt against the changes in the business environment is increased through close cooperation within clusters (Elbert et al., 2011) like the example seen in Bremen, Germany. In this cluster the central government authorities, local government institutions, civil society like foundations and education and research entities like Logistics Competence Center Bremen are involved in the cluster together with private industrial companies (Elbert et al., 2011).

Logistics clusters can (Elbert et al., 2011):

- Effect the supply side and the demand side within the broad market that it operates in.
- Effect the policies and scientific development through close relations with political, economic or scientific institutions.
- Cooperate with the other players in the cluster and thus transfer best practices to develop its organization and tasks.
- Reach common resources through jointly developed facilities

However, not all views are in favor of clusters and their benefits. Flamig and Hesse (2011) criticize the overestimation of cluster effects in Hamburg metro region in their study. They state that the economic developer impact of logistics clusters is not a shared idea by civil society groups and environmental NGOs. Also, there is no formal large scale planning regulation and this leaves room for informal guidelines which are specific to a region or a local governance body.

As a result of their study, they state that logistics centers or logistics related clustering investments should be analyzed 1) in terms of land use rather than only logistics flows; 2) in terms of regional relationships and functions rather than only mainport region's focus, 3) by a collaborative body of all related parties rather than only business community or legal planning bodies (Flamig and Hesse, 2011).

### **3.2.5. Concluding Cluster Theory and Logistics Clustering**

There are several studies that combine clusters with logistics agglomerations. Sengpiehl's (2010) study draws a framework depending on the enablers of a logistics-city cluster formation. He defends that these enablers have mutual relationships with influential forces like geography and politics and also with impact categories coming from the triple bottomline of sustainable development.

Elbert et al.'s (2011) study combines Porter's clusters with Pfohl's logistics systems that are composed of tasks, technology, staff and organization and develops a model taking Bremen-Germany as an exemplary research setting. According to Pfohl (2004a; 2004b) the components of logistics systems are impacted by un-influencable external and internal variables. Logistics clusters are means to transform un-influencable external and internal variables into organizational variables and thus achieve a higher level of security within their cluster (Elbert et al., 2011).

Hakam and Solvang (2009) analyze the flexibility and sustainability requirements in the competitive logistics environment and defend by citing cluster theory, that, many different facilities related with logistics activities position themselves around large harbors in order to transform the port into a freight village. Prozzi et al. (2002) state that the aims of the cluster theory would be realized at the expansion stage of an inland port when the tenants of the facility are diversified and thus information sharing, economies of scale benefits and integrated supply chain management can be achieved. Elbert et al. (2011) propose that research for developing standardized key performance indicators for cluster formation is required in the field. They validate this proposal with the fact that quantitative performance data for existing clusters are not available.

With the aim to contribute to the literature, this study suggests that in order to achieve competitive advantage through clustering, the industrial service design in such a cluster should be planned not only by taking the undertakers' point of view into consideration but, by taking into account the future users' orientations in terms of their business environment. Having a customer oriented perspective during the design phase, would lead the way for an expedited path towards enhanced competitiveness for the planners, managers and inhabitants of the logistics center.

With this perspective, this study combines the cluster theory approaches with marketing theory and apply this theoretical framework on industrial service design in a logistics center.

In order to use cluster theory as a mediating theory to operationalize its usage for logistics centers, the three schools of thought are linked with the basic determinants of logistics centers that are cited in the literature. This linkage is established upon the basic premises of cluster theory's schools. The summary is exhibited on Table 8.

**Table 8.** The Underlying Determinants of Logistics Clustering

| <b>ClusterSchool of Thought</b>                           | <b>Determinants</b>                                                                                                                               | <b>Proposition</b>                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Economic Geography /<br>Neo- Classical<br>Economic School | Economies of scale (Jarzemskis, 2007;<br>Notteboom and Rodrigue, 2009)                                                                            | Accepting these<br>determinants as the<br>reasons or antecedents of<br>positioning in a cluster for<br>an enterprise, this study<br>proposes that these will<br>also constitute the<br>customer requirements or<br>expectations from buying<br>the industrial service<br>produced in a logistics<br>center. |
|                                                           | Joint marketing (Jarzemskis, 2007)                                                                                                                |                                                                                                                                                                                                                                                                                                             |
|                                                           | Agglomeration economy- logistics service<br>providers, firms in logistics intensive<br>business, related industries etc. (Elbert et al.,<br>2011) |                                                                                                                                                                                                                                                                                                             |
|                                                           | Supplier specialization (Elbert et al., 2011)                                                                                                     |                                                                                                                                                                                                                                                                                                             |
|                                                           | Shared IT infrastructure (Jarzemskis, 2007)                                                                                                       |                                                                                                                                                                                                                                                                                                             |
|                                                           | Cost sharing (Jarzemskis, 2007)                                                                                                                   |                                                                                                                                                                                                                                                                                                             |
| Organizational Context/<br>IndustrialDistrictSchool       | Ability to reach common sources (Elbert et<br>al., 2011)                                                                                          |                                                                                                                                                                                                                                                                                                             |
|                                                           | Increased flexibility and responsiveness<br>(Elbert et al., 2011)                                                                                 |                                                                                                                                                                                                                                                                                                             |
|                                                           | Increased ability to adapt changes in business<br>environment (Elbert et al., 2011)                                                               |                                                                                                                                                                                                                                                                                                             |
|                                                           | Increased cooperation within the cluster<br>(Elbert et al., 2011)                                                                                 |                                                                                                                                                                                                                                                                                                             |
|                                                           | Interaction with seaports and other inland<br>nodes (Notteboom and Rodrigue, 2009)                                                                |                                                                                                                                                                                                                                                                                                             |
|                                                           | Vertical and horizontal collaboration<br>efficiencies (Eckhardt and Rantala, 2012)                                                                |                                                                                                                                                                                                                                                                                                             |
|                                                           | Intermodality benefit (Jarzemskis, 2007)                                                                                                          |                                                                                                                                                                                                                                                                                                             |
| BusinessStrategySchool                                    | Centrality and intermediacy between markets<br>(Ng and Gujar, 2009)                                                                               |                                                                                                                                                                                                                                                                                                             |
|                                                           | Economic Development (Sengpiehl, 2010)                                                                                                            |                                                                                                                                                                                                                                                                                                             |
|                                                           | Forwarders' impact (Jarzemskis, 2007)                                                                                                             |                                                                                                                                                                                                                                                                                                             |
|                                                           | Shared knowledge and skills and knowledge<br>spillover (Jarzemskis, 2007)                                                                         |                                                                                                                                                                                                                                                                                                             |
|                                                           | Best practice transfers (Elbert et al., 2011)                                                                                                     |                                                                                                                                                                                                                                                                                                             |
|                                                           | Presence of social and educational institutions<br>(Sengpiehl, 2010)                                                                              |                                                                                                                                                                                                                                                                                                             |
|                                                           | New transport solutions due to synergy<br>(Jarzemskis, 2007)                                                                                      |                                                                                                                                                                                                                                                                                                             |
|                                                           | Increased service quality in supply chains<br>(Jarzemskis, 2007)                                                                                  |                                                                                                                                                                                                                                                                                                             |
|                                                           | Quality of the whole center (Jarzemskis,<br>2007)                                                                                                 |                                                                                                                                                                                                                                                                                                             |
|                                                           | Additional services attracting new business<br>(Jarzemskis, 2007)                                                                                 |                                                                                                                                                                                                                                                                                                             |
|                                                           | Ability to effect supply and demand markets<br>(Elbert et al., 2011)                                                                              |                                                                                                                                                                                                                                                                                                             |
|                                                           | Ability to effect governments, policies and<br>scientific institutions (Elbert et al., 2011)                                                      |                                                                                                                                                                                                                                                                                                             |

This table shows the drivers of logistics cluster formation in the scope of a logistics center by considering the three main perspectives in cluster theory. These determinants also show the criteria to be looked for in order to evaluate the success of a logistics center. However, how much is either of these criteria more necessary when compared to others in the eyes of the customer? It is essential to include customer perspective in the definition of logistics center determinants.

It has already be mentioned many times that due to its economic development effects in a specific region, governmental bodies are in favor of logistics center development most of the time. But, not all the similar facilities are developed with reference to market demand. Meijboom and Rongen (1995) explore why firms cluster and where they cluster. In order to evaluate the customer perspective in logistics centers, it is essential to conceptualize the logistics centers first. In order to achieve this, they need to be analyzed in terms of their dimensions and the related literature.

### **3.3. LOGISTICS CENTERS: AN INTRODUCTION TO DYNAMICS OF LOGISTICS AGGLOMERATION**

#### **3.3.1. Logistics Trends Influencing Logistics Agglomeration**

The increased importance of logistics industry is dependent on long term trends observed around the world. These can be listed as globalization, new economy, changing market and demand structure, differentiated competition concept and technological development (Kilic et al., 2009). New economy is a general term that is used to refer radical changes in global economy and business environment. According to Gummesson (2002b), this change in the macro environment requires new evaluations of marketing and management thought as well. Old approaches to these sciences are no longer adequate for explaining the phenomena being observed in the new economy like the network society, increased share of services, new customer roles, information technology, globalization, deregulation of financial systems and mega-alliances between countries such as the EU (Gummesson, 2002b).

Although new economy is an important driver of cluster formation and success, it is an error to focus only on new economy for the explanation of clusters. The determinants of old economy and new economy are complementary components of a cluster system and such a system requires inputs from both of these systems (Bresnahan et al., 2001). Audretsch and Thurik (2001) refer to these two paradigms with the terms of managed (old) economy and entrepreneurial (new) economy. The exploration of Silicon Valley, a very successful industrial cluster, has shown that new economy factors are very valuable for the take off process of such clusters but for their foundation and start-up processes old economy inputs like connections to markets, firm-building capabilities, managerial skills are highly required (Bresnahan et al., 2001). So for a successful logistics cluster, the existence of both systems are considered as necessary.

In their study Notteboom and Rodrigue (2006) evaluate the changes in the logistics environment and try to forecast how these changes would effect the port industry that needs to keep up with market dynamics. They classify the trends in logistics industry under five main headings which are globalization in a demand-driven economy, shifts in supply chains, outsourcing, logistics integration and consolidation in the logistics service provider industry and new approaches towards logistics networks.

According to SEALS (2008) study, there are four external megatrends in logistics industry which are influenced by the changes in demand markets. These are:

- 1- Globalization of production and commerce

- 2- Transition to a post-industrial society where product customization and services seize increased market share

- 3- Smaller shipment sizes demanded on a more frequent and on-time basis

- 4- Growing external risks and environmental awareness

Besides these, there are also four main internal megatrends which influence how logistics activities are carried out. These are (SEALS, 2008):

- 1- Optimized and pull oriented supply chain processes

- 2- New technologies that assist in cost reduction and process quality

- 3- Ongoing deregulation of previously publicly owned logistics institutions and emergence of hybrid logistics organizations

4- Asset reduction and core-competency focus in logistics services for increased profits

Both studies refer to globalization on the first row which is a strong stimulus as it increases the physical distances between points of sourcing, production and consumption. This physical dispersion directly increases the importance of logistics channels and requires tailor-made solutions to all global logistics networks.

Globalization is run through multinational enterprises (MNEs) that source, produce, market and sell globally. However, these MNEs are no longer capital intensive companies that aim to hold as many physical facilities as possible at hand. Rather they build up their organizational strategy on brand development. So they focus on innovation and customer feedback and leave the other functions to globally dispersed business partners (Notteboom and Rodrigue, 2006). The growing globalization and increased competitiveness related with it, the requirement to operate materials management and physical distribution channels effectively and evolved production processes with new market demands incur the introduction of new logistics systems (Tsamboulas and Tatsi, 2010).

New logistics systems require new logistics facilities that are compatible with complex networks. This creates incremental land use with modern infrastructure. The off-shoring of manufacturing, the shift to a more decentralized inventory management approach in an era of higher oil prices, modal shift to environmentally friendly modes, the growth of online retailing, advances in warehouse technology, the reconfiguration of the waste supply chain and the adaptation of logistics systems to the effects of climate change are all influencing the logistics related land use today (McKinnon, 2009).

Due to the current developments in the global markets, companies try to reduce their warehouse space and lower their inventory levels. They also tend to make shorter contracts with logistics service providers in order to stay on the safe side against unpredictable market changes. Consequently, logistics providers try to reorganize in an asset-free manner and tend to rent the required facilities for their services. The real estate and infrastructure development, thus, is handled by specialized companies like logistics center organizations (Wagner, 2010)

The current logistics systems are changing also due to the new trends in production industries. Philosophies like lean management are reducing the inventory levels that are prevalent in different levels of the supply chain and pull systems require production in response to customer demand only, thus eliminating inventories as well (Caputo et al., 2003; Hesse and Rodrigue, 2004). These changes result in frequent but small batch orders. High customization needs flexible sourcing strategies and in a highly competitive environment these customized products and services should be in the markets in the shortest possible time (Notteboom and Rodrigue, 2006). Logistics centers act as consolidation points for these small sized orders and they increase the transportation efficiencies through their multimodal terminals (Eckhardt and Rantala, 2012).

However, although the globalization is still a strong trend in logistics system decisions, the dispersed supply, production and marketing networks seem to converge due to the increasing oil prices and the higher costs of transportation in long supply chains. Corporations tend to formalize regional distribution centers which are close to their retail outlets. In addition to that, increased pressures for time-to-market targets and increasing costs of labor in offshore manufacturing plants cause producers move their manufacturing facilities closer to the demand markets. In a business environment where supply chain flexibility is essential in maintaining competitiveness, companies are required to re-design operations in a modular way which is easier to adapt changes in final demand (Simchi-Levi et al., 2012). This closer network design is also influential in the establishment of regional logistics centers.

With the introduction of various supply chain types and logistics systems companies are obliged to create solutions for complex logistics problems. Supply chain size and structure, customer expectations, environmental conditions, globalization and organizational restructuring are the antecedents of the supply chain complexity that today's organizations are facing (Manuj and Sahin, 2011). This complexity is managed through strategic partnerships with 3PLs and 4PLs whom now offer all inclusive logistics solutions rather than just a transportation service. New logistics service offerings like information technology management or supply

chain design and solutions are demanded by producers (Notteboom and Rodrigue, 2006).

Due to this integrated demand coming from the customers, majority of the service providers try to vertically integrate in order to become a one-stop-shop for major customers. Mergers and acquisitions take place in the logistics industry that traditional 3PLs specialized in one logistics activity step into other sub-sectors of logistics (Notteboom and Rodrigue, 2006). This one-stop-shop perspective also facilitates the development of new business models like logistics centers.

Former logistics chains are now transformed into multi-member networks in which many different logistics activities take place. Due to the high customization requirements, producers prefer to postpone finishing processes as close to the customer as possible. Consequently, agglomerations where distribution, value added logistics services, warehousing and consolidation take place, position themselves close to supply, demand markets and international gateways as well. These agglomerations may be initiated from the maritime side as port operators tend to become more and more interested in inland logistics like Hutchinson does in China (Notteboom and Rodrigue, 2006).

Flamig and Hesse (2011) relate the rise of these inland terminals with integrated supply chain management (McKinnon, 2001; Robinson, 2002), the emergence of complex logistics networks (Christopher, 2005) and institutional issues such as the globalization and terminalization of seaports (Rodrigue and Notteboom 2009; Slack and Fremont, 2005). They are also the result of consolidated logistics service provider structures that offer full service solutions to their customers, the high service requirements of logistics outsourcing market which also has high service production costs and increased environmental pressures on especially transportation business. Inland logistics agglomerations form a rising area of interest both for public policy makers and private logistics companies due to the expansion of logistics industry and its increasing importance in line-to-market costs.

According to Notteboom and Rodrigue (2009) this inland agglomeration phase is a consequence of well established and globally linked large seaports. The main drivers of this shift can be considered as the complex freight distribution systems, high energy inputs and negative environmental effects of truck linkages to

inland consumption areas from ports and intermodal solutions that are being introduced against these problems. The initial appearance of this shift was in North America and Europe, the areas where the developed countries are located and where the final consumption nodes of global supply chains are located. Following them, inland terminals are now being developed in countries where enterprises are located on the earlier stages of global supply chains, namely the raw material, work-in-process (WIP) inventory or finished goods exporters (Notteboom and Rodrigue, 2009).

### **3.3.2. The Existing Classifications for Logistics Clusters**

As a result of global trends and evolutionary logistics systems, logistics companies and the industries that support them tend to position themselves closer to each other. This situation ends up with a variety of logistics clusters which serve for regional or global supply chains and for smooth flow of freight through these supply chain pipelines. However, they may differ depending on the modes they serve, the objectives they possess, the cargo types they handle, the geographical coverage they capture and such other characteristics they carry. In order to conceptualize logistics centers, it is essential to understand where they stand among all other logistics clusters. Therefore, in this part, existing classification efforts for logistics clusters will be explored in order to define and conceptualize logistics centers.

Notteboom and Rodrigue (2009) propose seven main dimensions in characterization and classification of inland nodes:

1- Transport modes served: A center may be unimodal, bimodal (rail-truck / barge-truck) or trimodal (rail-barge-truck).

2- Primary functions of the inland node: A node may focus only on cargo transshipment or may offer other services like customs clearance, warehousing, value added logistics services and such.

3- Size: This may be measured by the throughput volume or the land area.

4- The geography: This criterion is related with the geographical and network-wise location of the center, e.g. distribution center, intermediary or a collection node.

5- Cargo type: The cargo that the node handles may be conventional bulk cargo, swap bodies, trailers, unit loads or containerized trade.

6- Openness of the node: The node may be developed for a single-user or the facilities may be open to common-use.

7- Operational characteristics linked to the cargo handling function of the node: There are various cargo handling technologies dependent especially on the infrastructure and modal structure of the node.

8- Transshipment characteristics: The transshipment may be direct (from road to rail for example) or indirect (road-stack-rail, for example) and thus require a temporary storage area.

Nam and Song (2011) provide three different perspectives in classifying various logistics facilities. These are (1) traditional logistics and supply chain management perspective which is operationalized by distribution centers or warehouses, (2) freight transport perspective which is operationalized by freight villages or intermodal terminals and (3) foreign direct investment perspective which is operationalized by international logistics zones or free trade zones. A summary of reviewed classification efforts is represented on Table 9 together with the focus of classification effort.

**Table 9.** Summary of Logistics Cluster Classification Efforts

| <b>Authors</b>                      | <b>Focus</b>                           | <b>Logistics Cluster Types</b>                                                                                                                                                    |                                                                |
|-------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Meidute, 2005b</b>               | Geographical Coverage                  | Concrete Logistics Center<br>Virtual Logistics Center<br>Network Logistics Center                                                                                                 |                                                                |
| <b>Rimienne and Grundey, 2007</b>   | Functions Performed                    | Warehouses<br>Distribution Centers<br>Transport Terminals<br>Logistics Centers<br>Freight Villages<br>Logistics Nodes                                                             |                                                                |
| <b>Notteboom and Rodrigue, 2009</b> | Modes Served and Functions Performed   | Port Terminals                                                                                                                                                                    |                                                                |
|                                     |                                        | Rail Terminals                                                                                                                                                                    | -Satellite Terminals<br>-Load Centers<br>-Transmodal Terminals |
|                                     |                                        | Distribution Centers                                                                                                                                                              |                                                                |
| <b>Leitner and Harrison, 2001</b>   | Modes Served                           | Inland Waterway Ports<br>Air Cargo Ports<br>Maritime Feeder Inland Ports<br>Trade and Transportation Centers                                                                      |                                                                |
| <b>Wiegmans et al. 1999</b>         | Throughput Volume and Networking Types | Bulk Terminals<br>Transfer Terminals<br>Distribution Terminals<br>Hinterland Terminals                                                                                            |                                                                |
| <b>UNESCAP, 2009</b>                | Cluster Types                          | Container Yards<br>Inland Container Depots<br>Intermodal Terminals<br>Dry Ports<br>Freight Villages                                                                               |                                                                |
| <b>Higgins et al. 2012</b>          | Size, Hierarchy, Scope of Activities   | Container Yard /Warehouse<br>Distribution Center/Inland<br>Container Depot<br>Intermodal Terminal<br>Inland Port<br>Freight Village<br>Mainport Terminal                          |                                                                |
| <b>Roso et al. 2009</b>             | Geographical Proximity                 | Close Dry Ports<br>Mid-range Dry Ports<br>Distant Dry Ports                                                                                                                       |                                                                |
| <b>Notteboom and Rodrigue, 2006</b> | On/Off Port and Cargo Type             | Traditional Seaport Based<br>Logistics Parks<br>Container Oriented Logistics Parks<br>Specialized Seaport Based<br>Logistics Parks<br>Peripheral Seaport Based<br>Logistics Parks |                                                                |

|                                       |                                                                                                                                                                   |                                                                                                                                                                                                       |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |                                                                                                                                                                   | Virtual Seaport Based<br>Logistics Parks                                                                                                                                                              |
| <b>Xiuli, 2009</b>                    | Modes Served and Scope<br>of Activities                                                                                                                           | Port Logistics Base<br>Airport Logistics Base<br>Roadrail Through Transport<br>Logistics Base<br>Industry Logistics Base<br>Logistics Base in Bond<br>City Dispatching Logistics<br>Base              |
| <b>Eckhardt and<br/>Rantala, 2012</b> | Size, Extent of Logistics<br>Services, Openness of the<br>Logistics Center,<br>Orderliness of the<br>Development Process and<br>Regional Planning<br>Perspectives | Warehouse/Terminal<br>Logistics Center<br>Logistics Service Center<br>Logistics Area<br>Logistics Concentration<br>Logistics Zone                                                                     |
| <b>Cerreno et al. 2008</b>            | Multimodal Access,<br>Dedicated Freight<br>Transfer, Industrial<br>Development, Worker<br>support Services,<br>Commercial Activities,<br>Active Management        | Logistics Center Freight<br>Village<br>Community Integrated<br>Freight Village<br>Freight Terminal<br>Intermodal and Multimodal<br>Industrial Parks<br>Industrial Parks<br>Urban Distribution Centers |
| <b>Nathanail, 2007</b>                | Geographical Coverage                                                                                                                                             | City Terminals<br>Freight Villages<br>Industrial and Logistics Parks<br>Special Logistics Areas                                                                                                       |

Meidute (2005b) takes geographical coverage differences as basis when differentiating existing logistics centers. She suggests three types of centers which are concrete, virtual and network (sometime referred to as regional) logistics centers.

According to Meidute (2005b):

- A concrete logistics center is a facility that is developed and managed by either only one or several logistics service providers. This type of centers may fail to answer all requirements of customers as very few logistics service providers are able to specialize in all types of logistics activities. So a concrete center may become an entity where various providers unite and offer different logistics services to logistics center customers.
- A virtual logistics center is a rainbow company that supports the member organizations in only a single function like, for example, marketing.
- A network logistics center is composed of different logistics centers, distribution centers, several private companies and such. These members may

be dispersed in a wider geographical area but they seek to utilize benefits rising due to cooperation and synergy within the network. The organization is loose and less concrete when compared with other types. According to Meidute (2005b) within time, a logistics center may start with a virtual center version, develop into a network and then become a concrete logistics center.

Rimienne and Grundey (2007) conduct a classification based on the characteristics of consolidated facilities. Depending on the different functions being carried out in different types of centers, they propose six different types. These are warehouses, distribution centers, transport terminals, logistics centers, freight villages and logistics nodes in a widening sequence in terms of their scope and activities.

Warehouses are the storage points that aim to smooth and regulate the flow between suppliers and customers and they generally offer low level of services or singular functioning. Distribution centers are concentrated on the product flow and distribution rather than the storage. They generally offer consolidation or splitting services to multiple customers. Transport terminals aim to transfer freight from one mode to another. When they are combined with value added logistics services and all the other activities related with freight movement, they are called logistics centers. Logistics centers include various operators of different logistics services in a common area. According to Rimienne and Grundey (2007) freight villages are a larger version of logistics centers which offer broader range of services. Finally logistics nodes are the largest agglomeration in both service and geographical scope. They transfer large amount of freight between several modes and offer a large variety of services on an international basis. Maritime hubs and large scale terminals can be considered among these logistics nodes.

Notteboom and Rodrigue (2009) adopt a modular and functional approach for the classification of logistics clusters. They propose three major groups: port terminals, rail terminals and distribution centers. Port terminals conduct the necessary operations as an interface between sea and inland distribution systems. Rail terminals have three different sub-systems which are called satellite terminals, load centers and transmodal terminals. Satellite terminals are an extension of the port terminal that deliver the services which are not feasible either financially or

physically for the port to execute. Load centers are a synonym for conventional intermodal rail terminals. When associated with value added logistics activities, these centers may become freight villages (Notteboom and Rodrigue, 2009). Transmodal terminals are also called thruports which transfer freight from one rail operator to another on long distance travel (Rodrigue, 2008). Distribution centers offer the collection or distribution of freight generally supported with trucking systems. They also offer value added services like cross-docking, warehousing or load transfers (Notteboom and Rodrigue, 2009).

Leitner and Harrison (2001) conducts an identification and classification effort for inland ports by taking different transportation modes as a basis. They extend their study by adopting the product life cycle concept in order to determine which type of inland port is going through which stage of its life cycle. The four general types of inland ports according to their classification are inland waterway ports, air cargo ports, maritime feeder inland ports and trade and transport centers. Inland waterway ports serve generally to bulk cargo and are only feasible for countries with navigable inland waterways. Air cargo ports serve both to cargo and passengers although new types are being developed just for cargo transport. Maritime feeder inland ports are freight collection or distribution centers that may have intermodal facilities between road and rail and they aim to shift cargo operations from congested maritime ports. Trade and transportation center inland ports may be composed of even entire cities or regions. They offer a large variety of services with several modes of transport to the hinterland areas.

Wiegman et al. (1999) offer a classification based on freight volume and networking types. Bulk terminals serve to large volumes of bulk cargo equipped according to its own characteristics for handling and IT requirements. Transfer terminals are members of the hub and spoke networks where the aim is to transfer large volumes of freight between rail operators or maritime operators. Distribution terminals consolidate incoming freight for further distribution and additionally offer value added services. Hinterland terminals are for the consolidation of small volume coming from the inland destinations.

Xiuli (2009) makes a classification taking the examples in Chinese east coast as basis and names the logistics bases located on the port areas as port logistics

bases. There are airport logistics bases located on airport areas. Road-rail through transport logistics bases are similar with intermodal terminals. Industry logistics bases supply logistics services for industrial manufacturing facilities located inside the base. Logistics bases in bond are bases similar with free logistics zones which are free from customs taxes. Finally city dispatching logistics bases are similar with urban distribution centers which are close to a city and focus on distribution activities to the city center.

The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP, 2009) offers a five type classification in order to standardize the freight clustering activities. They start with simple container yards that offer cleaning, repair and storage services to containers. Inland container depots extend these services with customs clearance and inspection in order to function as a maritime port's container terminal. Intermodal terminals transfer freight between road and rail. Dry ports handle all types of cargoes and offer all services given by a seaport except the loading/unloading cargo to/from seagoing vessels. Freight villages are dedicated areas for all types of logistics activities where the infrastructure is shared and the aim is to achieve maximum synergy and efficiency.

Higgins et al. (2012) have evaluated the existing classification efforts and combined them under a systematic hierarchy. They group warehouses, distribution centers, container yards and inland container depots under the first level hierarchy of logistics centers. They define warehouses and distribution centers similar with Rimiene and Grundey (2007); container yards and inland containers depots similar with UNESCAP (2009). Under the second level hierarchy they define intermodal terminals, inland ports and freight villages. Intermodal terminals are described as freight transfer facilities in large volumes between road, rail and other modes like barges for further distribution. Inland ports are gate extension efforts for a maritime port and they are linked to the port either by drayage, inland waterway or rail shuttles. Freight villages are shared areas for clusters of industrial activities, intermodal transportation facilities of all modes, logistics services and supporting services. The mainport terminals located under the third level hierarchy have the largest scope both in terms of geographical periphery, handled freight volume,

offered services and physical facilities. Major seaports and airports in the world are among this type of clusters.

Dry ports are also considered to be a member of logistics agglomerations. However, due to the emphasis in the term, they are generally defined with a seaport point of view. Roso et al. (2009) take the broad definition of UNECE (1996: 105) for inland clearance depots as a basis for dry ports. According to this definition an inland clearance depot is:

*“A common-user inland facility, other than a port or an airport, with public authority status, equipped with fixed installation and offering services for handling and temporary storage of any kind of goods (including containers) carrier under custom transit by any applicable mode of inland surface transport, placed under customs control and with customs and other agencies competent to clear goods for home use, warehousing, temporary admission, re-export, temporary storage for onward transit and outright export.”*

So they assume that all facilities which are called freight nodal terminals, intermodal freight centers, freight villages, inland ports might all use the term dry port due to their connections to seaports.

A dry port is defined as an inland terminal that handles cargo and is connected to a seaport by rail or barge services (Roso et al. ,2009; Wiegmans et al., 1999). However, the “dry” emphasis in the term seems to be excluding the barge terminals from the specified set (Rodrigue et al., 2010). Rodrigue and Notteboom (2010) even define ports that are served by feeder services as inland terminals for the hub ports that they are serving to.

In a classification effort of dry ports, Roso et al (2009) take the perspective of geographical proximity and they suggest the different objectives and benefits of close, mid-range or distant dry ports. Here the proximity concept is taken from a port-centric point of view and thus the dry port is perceived as an extended gate for a sea-port.

Notteboom and Rodrigue (2006) have named the distribution centers established on port area or close vicinity of a port with an intermodal connection as logistics parks. They observe (Buck Consultants International, 1996 and Kuipers,

1999; both cited by Notteboom and Rodrigue, 2006) five different types of logistics parks:

- Traditional seaport-based logistics parks: Traditional container areas in seaports.
- Container oriented logistics parks: Large warehouses close to container yards which are supported with intermodal facilities.
- Specialized seaport-based logistics parks: These parks generally concentrate on single functions like storage of liquid bulks or combination of logistics information systems and fourth party logistics services.
- Peripheral seaport-based logistics parks: These are located outside the port area but still very close. They mitigate the congestion and land cost related expansion problems in the seaport. They are similar with close dry ports (Roso et al. 2009).
- Virtual seaport-based logistics parks: These parks are located far from the seaport but they are actively performing with a single port orientation and serving to the throughput of that specific port. They are similar with distant dry ports (Roso et al. 2009).

Eckhardt and Rantala (2012) summarize the results of their projects held in Finland where they offer a classification of logistics centers depending on size, extent of logistics services, openness of the logistics center, orderliness of the development process and regional planning perspectives. The classification that they develop is shown on Table 10.

**Table 10.**Logistics Center Categorization Model

| <b>Category</b> | <b>Title</b>             | <b>Description</b>                                                                                                                                                                         |
|-----------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C0              | Logistics zone           | A zone along the main transport infrastructure formed by logistics concentration, areas and centers.                                                                                       |
| C1              | Logistics concentration  | A spontaneously formed compact group of logistics centers and areas with several management organizations, operators and industries.                                                       |
| C2              | Logistics area           | Organized area for logistics operations, freight village or business park, including several logistics centers, warehouses and terminals with logistics services. Several actors involved. |
| C3              | Logistics service center | Open logistics center. One specific management, possibly several actors.                                                                                                                   |
| C4              | Logistics center         | Closed logistics center. Operations for specific trade or industrial companies' needs.                                                                                                     |
| C5              | Warehouse, terminal      | Private warehouses and terminals, surface area under 10.000 m2.                                                                                                                            |

Source: Eckhardt and Rantala, 2011; 2012: 616

Cerreno et al. (2008) develop their own classification for different freight facility types within their study evaluating European, Asian and American experiences with freight agglomerations.

1- Freight Villages: There are two basic types of freight villages. The first one is called Logistics Center Freight Village (LCFV). These facilities are areas that contain various logistics activities and intermodal freight transfer which both are handled by different operators. They also offer support services like maintenance, gas stations, hotels or restaurants but these are mainly for the residents or customers which are passing through. The second one is Community Integrated Freight Village (CIFV) which is a type that is specially seen in the USA. Having all functions that are prevalent in European examples of freight villages, these facilities also have retailers, restaurants, cafes, childcare, commercial centers and even residential areas. So they become complete villages together with the community integration around them.

2- Freight Terminals: A freight terminal is a facility where loading, unloading and freight transfer between multiple modes takes place. These facilities are generally operated by a single company.

3- Intermodal and Multimodal Industrial Parks: These parks either have an intermodal terminal or no dedicated freight transfer between modes. They may not be managed by a single body and generally they don't have commercial activities or residential support services.

4- Industrial Parks: These facilities lack multimodal transport access and infrastructure. They provide other logistical services. For better performance, they may be located within a close drayage distance to intermodal terminals.

5- Urban Distribution Centers (UDCs): These facilities regulate the shipments to and from urban centers. They generally act as consolidation or deconsolidation points for final consumption areas. Their main aim is to decrease the vehicle miles traveled within a city center and eliminate empty haulage, thus avoid traffic congestion in the city.

Nathanail (2007) names logistics centers as Transport and Logistics Terminals (TLTs) and classifies them under four main headings as city terminals, freight villages, industrial and logistics parks and special logistics areas depending on the research of project REFORM (REFORM, 2002). City terminals serve urban areas through their forwarder or retailer residents. Freight villages have intermodal terminals that serve national networks through logistics companies located inside. Industrial and logistics parks contain industrial activity as well as logistics activity inside. Special logistics areas are the largest ones in scale and are connected to all modes of transport.

Another name used for a version of logistics cluster is freight hub. Freight hubs are facilities that are established for the transfer and handling of large scale freight and they are generally located on extensive hub-and-spoke networks (Racunica and Wynter, 2005). Due to this volume requirement, they need to be equipped with large scale transshipment infrastructure and throughput capacity (Sengpiehl, 2010). Because of their orientation towards large scale freight flow, generally they do not offer additional logistics services (Hesse and Rodrigue, 2004). They can be considered similar with large scale intermodal terminals.

The main reason behind the variety of the terms defining inland terminals depends on the different geographical settings that they are established upon, the different functions that they produce and the different actors that are involved in these entities. Rodrigue et al. (2010) propose the usage of inland port as an umbrella term for similar facilities and introduce containerization, availability of a dedicated link to a seaport and massification of cargo flows as the required criteria in defining inland ports.

Among all the other perspectives, seaport-hinterland interface perspective is a rather widely studied area within logistics clusters research due to its connection with the vast port development and management literature. Dry ports or inland ports are facilities that have emerged for removal of congestion at port areas but are today essential for seaports in order to assist them in capturing their hinterlands. They are also progressing towards logistics centers when combined with value added logistics and distribution services. So they require a closer look for a better understanding of logistics center evolution.

### **3.3.3. Ports and Logistics Clusters**

Wilmsmeier et al. (2011a), defend that the original dry port concept which was invented for landlocked countries first, can be a very beneficial tool for seaports which are lacking the necessary amount of throughput and lost their viability. According to Notteboom and Rodrigue (2006) after becoming a part of global transport chains and important nodes of supply chain networks, ports have become much more interested in stakeholder demands. They started to work with stakeholder groups in order to identify their requirements that would facilitate overall logistics performance. The information flow and consequent knowledge transfer between companies is the basic rationale behind commercial clusters (Notteboom and Rodrigue, 2006). Logistics clusters, being defined either as logistics centers or inland ports, should also follow this path so as to develop successfully in supply chain networks.

The recent study of Monios and Wilmsmeier (2012a) state that inland terminals have been under-theorized in the literature and they make an effort to link

the concept of inland terminals with port regionalization process (Notteboom and Rodrigue, 2005) in port development theory. The inland terminals and their integration with seaports are mainly linked to the fourth stage of port development according to van Klink's (1996) progression of previous port models which is called the port networks. This stage is a rather new approach to port development as it focuses on port's integration with inland terminals. As a result of the logistics orientation of mega carriers and big hub ports, the discontinuous hinterlands of ports are connected to them by freight corridors passing through inland hubs like logistics centers (Monios and Wilmsmeier, 2012a).

As the inland transport infrastructure develops and inland facilities for freight clusters are established, the hinterland of a port is no longer dependent on the physical distance solely. Port hinterland is redefined as the area that can be reached more rapidly and at a lower cost than others ports. Today ports are competing to handle cargo (discretionary cargo) that are far beyond their geographical captive area and thus they seek to cooperate or vertically integrate with inland port terminals (Wilmsmeier et al., 2011b).

Notteboom and Rodrigue (2009) suggest that there are many advantages of cooperation with inland ports for seaports. These are listed as (p.18):

- *Increasing regional productivity by a more efficient connection with inland locations;*
- *Stronger support for the cargo handling function of the port because of a more optimal use of space and increased possibilities for a successful modal shift;*
- *Stronger position to attract investment and subsidies because of an integrated hinterland product;*
- *Expansion in the hinterland, a possibility to capture a market share of competitor ports;*
  - *Binding of market players in the hinterland;*
  - *Better insight and level of service in the local markets;*
  - *Prevention of price corruption;*
  - *Increased potential for intermodal services, also on shorter distances;*
  - *More attractive hinterland services because of an increased flexibility, reliability and frequency;*
- *Further strengthening of the logistical pole, including advantages for both seaport and inland port;*
- *Simplified custom procedures.*

The competitiveness of a seaport relies under its ability to create synergies with other actors especially located in its hinterland. Formerly, seaports used to focus

their investments only to the port area and left the hinterland connection development with seaports to the shippers, forwarders, road/rail transport operators (van den Berg and de Langen, 2011). However, this has changed with competitive pressures on seaports to attract more cargo and many ports followed the port regionalization process (Notteboom and Rodrigue, 2005). The routing flexibility requirements of the logistics industry cause inland ports to cooperate with more than one gateway and this creates a competition among ports to seize the inland freight movements and co-modal cooperation with other players in the transport industry (Notteboom, 2010). These developments trigger port operators' interests in inland port development.

Port centric approaches to inland port development are various. There are studies exploring if an inland port is developed by the inland operators' initiatives or by the ports' intention to extend their hinterland and capture the cargo coming from overlapping segments of their hinterland. The studies search different cases adopting either backward or forward vertical integration strategies in order to measure the existing trends in the developing relations between two major members of industrial supply chains, i.e. ports and inland ports. However, as in the example of Wilmsmeier et al. (2011b), these cases do not cover developing countries generally due to the poorly developed transport infrastructure in these countries and incompatibility with the requirements of a competitive logistics environment.

As seen in practice, traditionally the dry ports are developed from the landside due to a geographical handicap like being landlocked or having poor maritime access (Wilmsmeier et al. 2011b). However, there are other definitions stating that dry ports are seaport extensions where the rail operations are controlled by shipping companies (Roso et al., 2009). Barcelona is an example of seaport integration with inland terminals and the port has improved its services and efficiency by increasing these inland activities (van den Berg and de Langen, 2011). This seaward approach defines dry ports as facilities aiming to smooth the operations of the port for a better service to both the port's and its hinterland's customers. It has also gained recognition in terms of marketing strategies as several dry ports offer value added logistics services and thus become freight villages or position themselves near freight villages for better coverage (Wilmsmeier et al., 2011b).

Wilmsmeier et al. (2011b) name an inland initiative to develop a dry port or any other inland facility as “inside-out” and a port operator, port authority or ocean carrier initiative to develop an inland port as “outside-in”. An inside-out strategy may be employed just for the benefits of the inland freight flows and may become integrated with seaports within time. Or they may start with an integration focus from the beginning. Outside-in development model is operationally focused and aims to execute extended gate functions for the seaports (Monios and Wilmsmeier, 2012a). Ports used to be afraid to compete with inland facilities but within the changing environment of international supply chain flows they understand the benefits that would come together with cooperation (Notteboom and Rodrigue, 2009).

An example for an outside-in development is Rotterdam port operator ECT that vertically integrates with inland terminals through acquisition of Venlo, Duisburg and Willebroek terminals. Examples of an inside-out development can be stated as Sweden’s dry ports which are developed by municipalities located inland and integrate with ports afterwards (Wilmsmeier et al., 2011b). Monios and Wilmsmeier (2011) extend this research to 5 different country cases where they give examples from Spain, Netherlands, Sweden, Italy and the USA for both inside-out and outside-in traffic corridor developments between seaports and inland terminals. The results with Italy are interesting as the freight villages in Italy were totally logistics oriented but are not considered to be successful in integrating with seaports.

An outside-in development approach is already at place in Russia as well. The dry ports are mainly developed as extended gates for main seaports of St. Petersburg, Novorossiysk and Vladivostok, but they suffer from the required coordination among main public and private stakeholders like the customs, transport operators, freight forwarders or the shippers (Korovyakovsky and Panova, 2011).

Ng and Cetin (2012) state that the inside-out model is much more common in developing countries when compared with outside-in model widely seen in developed countries. This is due to inside-out development model’s public sector perspective and regional development aims (Monios and Wilmsmeier, 2012a). However, inside-out development may not always match with port strategies. These facilities generally align with regional economic development targets and supply

chain objectives. For a better integration with seaports, container management should be included in inland terminal facilities (Monios and Wilmsmeier, 2012a).

The opportunity of seaports to get integrated with global supply chains is not only through capturing the hinterland with inland ports but also through foreland-based integration (Rodrigue and Notteboom, 2010). This is especially for intermediate hub ports which rely on only transshipment capacity for profits. Integrating with smaller feeder ports and the inland ports of these small feeder ports would increase their volume and let them maintain or increase their market share by attracting shipping lines.

### **3.3.4. Definition and Conceptualization of Logistics Centers**

Among these logistics cluster hierarchies, logistics centers are generally below gateway scale agglomerations and important nodes in the local, national and international transportation systems. Despite the agreed upon functioning of logistics centers in terms of logistics service clusters, there is a certain amount of debate on different terms carrying partly or all characteristics of these facilities. The variety of these terms depend on both the theoretical approach towards conceptualization efforts and practical implications that can be observed in different parts of the world. There has been several attempts to define and standardize logistics centers either with the functions they serve or the characteristics they possess. This part reviews these definition efforts in order to form a conceptual framework regarding logistics centers.

Cerreno et al. (2008: 3) define freight villages as: “a clearly demarcated and actively managed location, within which both multimodal freight transfer facilities and industrial activities are situated, along with commercial and/or worker support activities.” Meidute (2005a) conducts a comparison study of the existing definitions made for logistics centers. She starts with an analysis of the two different words forming the concept and combines this analysis with the double nature of logistics centers. From one perspective the logistics centers are a part of the transportation infrastructure. They are integrator of various transportation modes (Tsamboulas and Kapros, 2003) and they are related to intermodal transport chains (Konings, 1996).

From another perspective, logistics centers are evaluated to be business generators that promote the development of integrated and high quality logistics services. Meidute (2005a) analyzes different definitions that focus on either transportation infrastructure dimension or business generator dimension of logistics centers.

Kayikci (2010: 6298) names a logistics center as an intermodal freight logistics center and defines it as a “cluster of quality industrial/intermodal /distribution/logistics buildings located within a secure perimeter where a range of support services are provided by every user.”

In Italy, logistics centers are called Interporto and have been described by law in order to specify its objectives and limits (Cassone and Gattuso, 2010). According to this law, logistics center is a well organized set of structures and integrated services for the exchange of goods between the different transport modes, which includes, however, a railway station that can form or receive complete trains and is connected with ports, airports and highways (Italian Law n.240/90, in Cassone and Gattuso, 2010).

Quack et al. (2008) classify freight villages with the city logistics perspective under consolidation centers where urban freight transport is consolidated in order to move in and out of urban areas. They also emphasize that freight operators resist these consolidation centers due to their obligatory character forced by state authorities. This point of view in defining logistics centers is related with an urban distribution approach which has both proponents and opponents. Munuzuri et al. (2005) suggest that the authorities should balance the benefits of both logistics companies and the society living around the facility in order to build up a sustainable logistics center that carries urban distribution center properties.

An official definition of a logistics center is made by Europlatforms EEIG (2004: 3), the European Association of Freight Villages:

- *A freight village is a defined area within which all activities relating to transport, logistics and the distribution of goods, both for national and international transit, are carried out by various operators.*
- *These operators can either be owners or tenants of buildings and facilities (warehouses, break-bulk centers, storage areas, offices, car parks, etc...) which have been built there. Also, in order to comply with free competition rules, a freight village must allow access to all companies involved in the activities set out above.*

- *A freight village must also be equipped with all the public facilities to carry out the above mentioned operations. If possible, it should also include public services for the staff and equipment of the users. In order to encourage intermodal transport for the handling of goods, a freight village must preferably be served by a multiplicity of transport modes (road, rail, deep sea, inland waterway, air).*
- *It is vital that a Logistics Centre be managed as a single and neutral legal body (preferably by a Public-Private-Partnership) if synergy and commercial cooperation are to be ensured. Finally, a Logistics Centre must comply with European standards and quality performance in order to provide the framework for commercial and sustainable transport solutions.*

When this official definition is analyzed, it can be stated that there are many different components that a logistics center organization needs to manage. Cassone and Gattuso (2010) emphasize three important functions related with a logistics center organization:

- This organization is a hosting organization for different logistics service providers and also product postponement processors,
- Organization needs to integrate different modes of transport both physically and through extensive usage of information management tools
- Organization provides direct and support services for better utilization of the logistics center area and extended common usage of all facilities and control of common logistics center facilities.

In spite of the variety in the definitions of different logistics clusters, there seems to be a consensus on the definition for an intermodal terminal. With reference to intermodal transportation definition done by UNECE (2001), intermodal terminals are areas where freight is transferred from one mode to another without handling the cargo inside the transport unit. Sengpiehl (2010) states that freight villages, inland ports or freight hubs are progressions of this intermodal terminal concept through integration with additional logistics services or capacity enhancements. In his study where he analyzes Spanish ports' hinterland connections Monios (2011) suggests to collect similar inland facilities in Europe under the term intermodal terminal or inland terminal and conduct further differentiation efforts depending on performed functions in various sites.

Assuming that the logistics centers are an extended version of conventional intermodal terminals, intermodal transportation infrastructure is an essential part in logistics center development. Although it is not sufficient alone, availability of intermodal transportation services is crucial in order to call a facility a logistics center. The integration of different transportation modes has been well covered and promoted in European studies through research projects covering terminals and well established organizations (Janic and Reggiani, 2001; Lowe, 2005). Its usage is tried to be increased through IT networks of freight villages within EU (FREIA, 1998). Freight depots or urban distribution centers are seen as motivator facilities that increase the adoption of railways combined with trucking services by UK customers (Haywood, 1999). Similarly in China, dry ports are seen as promoters for the development of intermodal transport especially for landlocked countries (Hanaoka and Regmi, 2011). Therefore, intermodality also requires some attention in the conceptualization efforts of logistics centers.

Generally the studies related with logistics centers are practical studies that aim to lead the way for logistics center developers or operators. Studies aligned with project reports or case studies are various (e.g. Cerreno et al., 2008; Nathanail, 2007) and these take a certain logistics center or a specific geographical region (e.g. Winkler and Seebacher, 2011 explore freight villages in Germany) as focus of attention. This is due to the rapid rise of practice when compared to theory and it is similar with the research on intermodal transportation which is an essential part of logistics center concept. Bontekoning et al. (2004) have executed a comprehensive study related with intermodal rail-truck freight transport literature and they proposed that intermodal transportation as a transportation research field was at a pre-paradigmatic phase in 2004.

Depending on the literature review they have carried among publications between 1995-2001, the field has started to emerge at the beginning of 1990s and shown an increasing trend afterwards. The majority of the research has been carried out either in the USA or in Europe. The definitions are various and a conceptual model is missing. The existing work is not coherent and the research aims are widely dispersed. While analyzing the studies investigating the intermodal terminals, the authors state that (p.17):

*Another issue is the number of objectives a terminal must meet as a consequence of the multi-actor chain co-ordination. Terminals must serve the demands of shippers, truckers, rail operators, as well as of the terminal operator itself. These objectives can be contradictory. We did not find studies which touch upon this subject.*

As logistics centers are required to have an intermodal terminal inside, this gap in intermodal transportation literature may prevail for the logistics center literature as well. The contradictory demands of various actors are essentially needed to be considered when a logistics center is being developed. The objectives that a logistics center will meet are various and they have a dual structure in terms of public and private interest. They are also rather new in logistics literature. Consequently, they are considered to be in a pre-paradigmatic phase as well.

IBI Group (2006) proposes a three dimensional approach to conceptualize logistics centers: (1) proximity to international gateways, (2) modal orientation, (3) the type of principal traffic (export/import). Proximity to international gateways approach is related with port-hinterland interface literature as majority of international gateways today are composed of large seaports. Port-hinterland literature constitutes the majority of the research made on logistics clusters. Generally this part of the literature focuses on terminal structures like dry ports or inland ports where the objective is to relieve the port centric logistics activities. Monios and Wilmsmeier (2012b) contribute to the literature by carrying a conceptual discussion upon the terms dry port, port-centric logistics and offshore logistics hub in order to differentiate them. After exploring the different definitions made for dry ports, they adopt the approach that accepts dry port as an inland facility developed for landlocked areas due to poor access to global transport networks. Dry ports also offer extra land capacity for seaports with limited area (Roso and Lumsden, 2009). Port-centric logistics are value added logistics services carried at the port as long as the port has the required land and infrastructure for them. Offshore logistics hubs are logistics centers that are used for either the collection or the further distribution of a landlocked country's freight and that are located on another country (Monios and Wilmsmeier, 2012b).

Related with international gateway connectivity, inland nodes also appear in port development theories which constitute a rich literature and thus has been explored in the previous section. Not all port development theories evaluate the port-

hinterland relations though. For example, Bichou and Gray (2005) criticize UNCTAD's port generation taxonomy due to its focus on sea/shore interface and neglecting port/inland interface like dry ports, container depots or logistics centers. However, the interest of ports towards their hinterlands is not a single-sided one. Railroads who have the financial power to build port facilities, are also interested in seaports as they are points where freight is transferred between modes (Fawcett, 2006) and thus they are the international gates for railroad cargoes. So the direction of interest may be both ways depending on the financial and commercial power of the specific transportation mode operator.

Modal orientation approach has other examples in the literature. Although the majority of logistics centers have a rail/truck intermodal terminal, there are studies that focus on multimodal interface with airway transport. Li et al. (2009) call this type an Airport Logistics Park (ALP) and define it as a logistics center that aims to optimize the aviation logistics through the utilization of several transportation modes, warehousing and other value added logistics services. There are certain criteria which are very important for the industrial service design of a logistics center like an ALP. These can be listed as the industrial activity and structure around the logistics center, economy, transport infrastructure, modern logistics planning of the wider region. (Li et al., 2009).

Within the review boundaries of this research, none of the logistics center studies focus on the type of principal traffic in terms of exports or imports. But a different approach relies in the orientation of the center in terms of being a collection or distribution node. A logistics center may serve to retailer or consumer markets for final distribution of freight coming in. This perspective defines logistics centers with a public policy approach on urban freight distribution and its adverse effects. Freight platforms are used as an umbrella term for policy measures related with nodal transportation infrastructure and they are defined with the existence of transportation companies and at least two different transportation modes in an area (Russo and Comi, 2004). There are many studies that define this type of a logistics center under the name of an urban distribution center (e.g. Cerreno et al. 2008; Higgins et al. 2012).

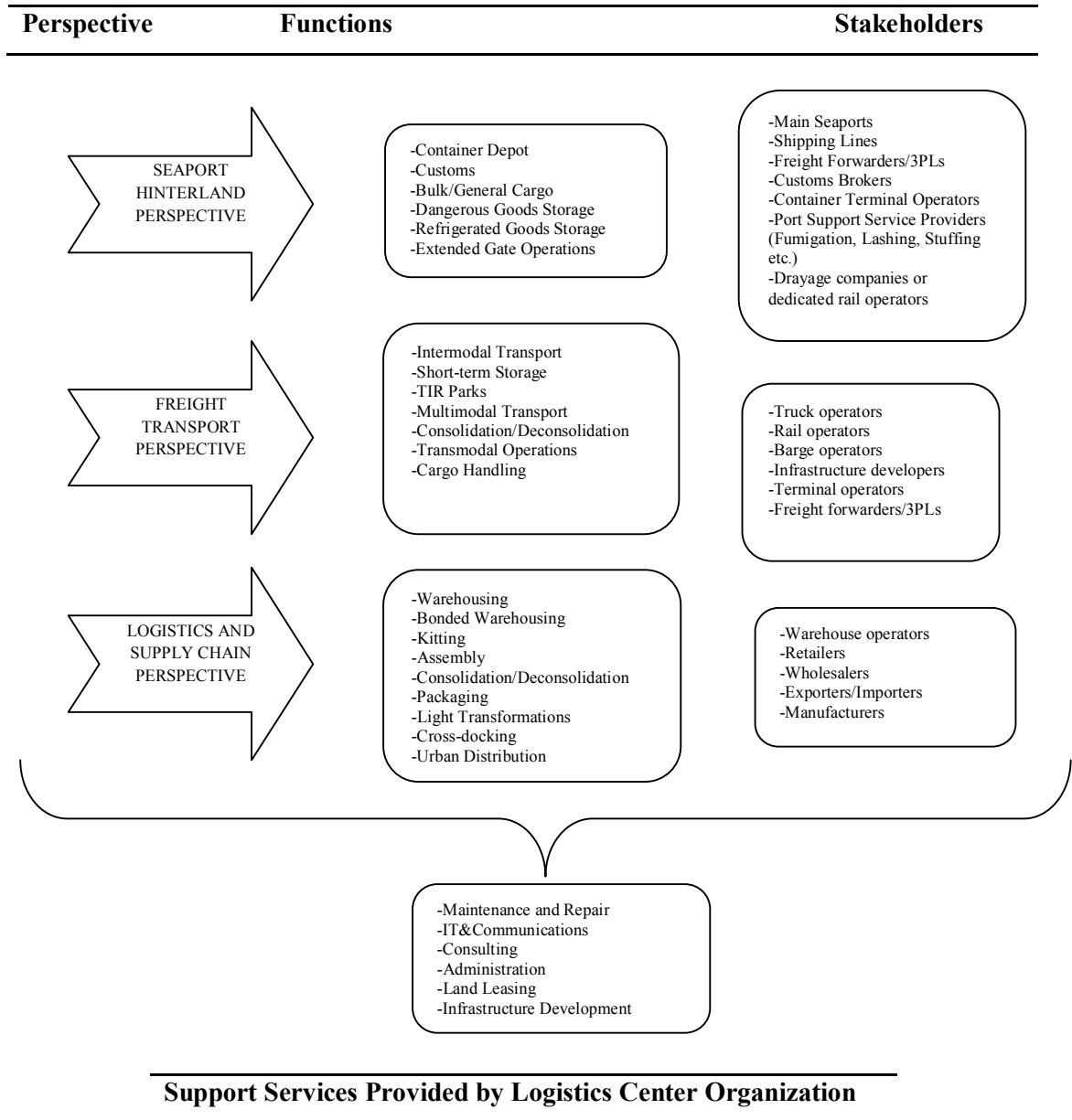
Russo and Comi (2004) differentiate the overall freight movement under two main headings: end-consumer movements and logistics movements. End-consumer movements occur due to the consumer purchases of goods and their transportation to the final consumption nodes. Logistics movements are the transport of freight for further production or sales. These movements take place in the same transportation system so Russo and Comi (2004) offer some models in order to synchronize the demand on urban freight transport by taking both of these systems into consideration. This is also important for sustainable urban development, but freight transport and lack of awareness regarding its negative impacts on quality of urban life by both public and private authorities cause negative results in urban freight transport. The stakeholders within a city's limits should adopt logistics competencies in order to manage urban freight transport in a sustainable manner (Lindholm and Behrends, 2012).

The result of this review can be summarized in certain characteristics that are required by a logistics cluster facility to be called as a logistics center:

- 1- An intermodal terminal which serves at least two transportation modes
- 2- An either national or an international coverage area
- 3- The availability of freely competing different logistics service operators,
- 4- The supporting services for the fundamental facilities,
- 5- The management structure which is a single body either public or private.

Adopting partly from Nam and Song's (2011) approach, this study draws a theoretical framework to logistics clusters considering three main perspectives to existing cluster initiatives. These are (1) seaport-hinterland interface perspective, (2) freight transport perspective, (3) traditional logistics and supply chain perspective. Under the light of these perspectives the functions that are required to be performed in a logistics center and the stakeholders that the logistics center organization needs to build relations are represented on Figure 17.

**Figure 17. Logistics Center Perspectives, Functions, Stakeholders**



Seaport-hinterland perspective views the logistics center as a dry port which has a direct connection with either one or more seaports. This kind of an organization fulfills all functions performed in a seaport except loading/unloading cargo to/from sea going vessels. The stakeholders related with the operations here are similar with a seaport's stakeholders. This perspective in a logistics center requires a strong

commercial connection and a dedicated transportation link – either with drayage or rail – with a seaport.

Freight transport perspective is similar with intermodal terminals, freight hubs mentioned in logistics cluster literature. This perspective is interested in the transfer of freight incoming and outgoing to/from the logistics center in a most efficient way. There may be short time storage areas for containers or other types of cargoes which need to wait for their schedules. This part of a logistics center may be managed by one or more operators and requires high infrastructure investment. In case of availability, an airport terminal can be utilized under this function.

Traditional logistics and supply chain perspective on the other hand, is interested in either collection for further transport or final distribution for consumption. This perspective in a logistics center is highly involved in shippers or manufacturers which may be located inside or outside of the center. The facilities functioning under this perspective process light transformations, provide value added logistics services, consolidate or deconsolidate cargo for further transport, store inventory for balancing production lines. They are essential nodes in global or national supply chains' logistics systems. They also respond to various supply chain requirements for a better chain performance (Notteboom and Rodrigue, 2009):

- 1- Inland terminals support supply chain activities in terms of providing alternatives. The best example for this is the management of intermodal transportation through logistics centers and thus changing the transportation structure of the supply chain.

- 2- As the freight is removed from congested seaport areas to inland nodes, it would be easier for supply chains to offer flexible responses to customer demand in terms of delivery frequency, batch size and schedules.

- 3- Inland terminals minimize the empty hauls during the import-export transportation unit picking process. This is beneficial for both the shipper and for the transport operator who requires a better management of hinterland movements.

Not all of the logistics centers carry all three perspectives. Some of them may act like freight hubs only, some provide urban distribution center services for their peripheral markets and some are strongly connected with global seaports. This conceptual framework makes an effort to draw a holistic approach to the existing

facilities in the world with all functions being performed. As mentioned by Tsamboulas and Kapros (2003: 142) *logistics centers are the part of an integrated transport system which is developed or revised by the shipper ( the customer of the logistics center)*. So customer requirements are important when deciding which perspective/s to adopt when developing a logistics center.

After reviewing and evaluating the different approaches to logistics centers, it is essential to consider different aspects of such agglomeration efforts. Among these aspects, the frequently studied ones are the development of such facilities, the selection of their locations, the internal layout of the facilities and their environmental impacts. As Turkey is the research setting for this analysis, Turkish initiatives and literature regarding logistics centers should also be explored.

#### **3.3.4.1. Logistics Center Development and Management**

According to Rodrigue et al.(2010) some inland ports are mainly private entities and are linked to distant supply chains as well. Some are established by public authorities with the aim of developing the regional economy and stimulate freight distribution. Some finance their own operations themselves, some are subsidized by the state especially for infrastructure development. Sometimes an inland port may serve only to a specific region and sometimes even to a single customer.

Regardless of its geographical scope or development objectives, competitive logistics infrastructure is a necessary element in order to achieve supply chain responsiveness and flexibility (Winkler, 2009). Logistics centers are among crucial elements of this infrastructure with their multimodal capabilities and cost efficiency potentials. However due to their dual structure in terms of infrastructure development and business generation, the development process needs to be coordinated with various stakeholders that will take part in logistics center operations from different perspectives.

Logistics center areas use extensive land space, require high accessibility and transfer freight from one mode to another. In addition to these, their operations tend to become similar in time due to high intermodality usage and unitization of cargo

through containers (McCalla et al., 2001). Walter and Poist (2003) state that there should be a certain asset cluster in order to develop an inland port in a specific region and they list these assets as follows by quoting from Trade Point – USA:

1- Transportation infrastructure: air links, rail roads with intermodal linkage and accessible highways

2- Demographic advantage: proximity to a volume of manufacturers or consumer markets

3- Geographic advantage: proximity to ports and easy access to transportation network

4- Presence of large shippers whom are ready to use an inland port

5- Presence of a modern information technology and telecommunications infrastructure

6- Cooperation and well managed councils among public and private entities that will take part in inland port either as an operator, customer or supplier.

7- Willingness to market the inland port to gain community support

8- Good project management

The planning phase of a logistics center is a complicated process that includes location selection, decision on the degree of governmental interference in the system, the functions that are to be developed, the land usage, the transportation system, the daily operations, the financing methods, the information system and the overall policy for the development and management of the center (Xiuli, 2009). To conduct extensive research on location selection of logistics centers, to provide the required infrastructure to the center and to manage the functionality in the most effective way are essential for avoiding idle investments and capacity (Elgün, 2011). Governmental planning policies are also essential in the development of inland ports in order to avoid oversupply and utilize the most feasible locations (Bergqvist and Wilmsmeier, 2009).

Some logistics centers are planned to be so and thus developed initially with this purpose. Some of them, however, become one through time, evolve depending on the added functions and market demand (Cerreno et al., 2008). Actually, the policy and planning phases for inland terminals must be aligned with market demand (Monios and Wilmsmeier, 2012a). Winkler and Seebacher (2011) conducted a study

on freight villages in Germany in order to understand their establishment and management processes. In their exploratory study they collected the responses of logistics centers in Germany to questions related with the development, management, location, multimodal infrastructure, internal cooperation and future plans. According to their findings, it is also essential to involve future potential inhabitants of a logistics center to the planning phase so as to design and develop the facility by taking both parties' benefits into consideration.

Governmental policies are very important in logistics center development as these facilities also increase employment, stimulate economic development. According to Tsamboulas and Tatsi (2010: 7) a national strategy for development of logistics centers needs to adopt following policies:

- *Rationalise logistics activity and assist in carrying forward territorial planning, creating attractive conditions for new market players*
- *Encourage intermodality, upgrading existing structures and networks, and creating a conducive climate for the development of rail transport and increased use of installed port capacity*
- *Promote environmental gains by reducing air pollution*
- *Develop the national economy and certain specific territorial areas, generating employment and new forms of wealth-creation*

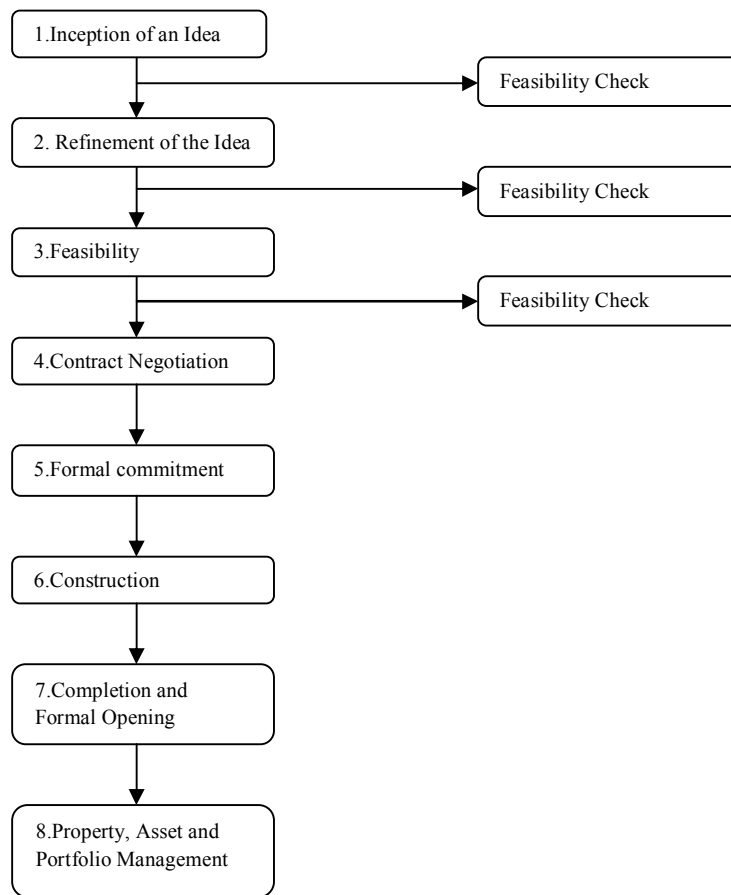
Governmental policies are also important in terms of avoiding excess planning of logistics centers. Inland ports are entities that are subject to competition with other similar entities especially when overlapping markets are considered. So too many inland ports may constitute an excess of supply and market conditions may drive them out of business. In India (Ng and Gujar, 2009) or in Rhine/Scheldt delta (Notteboom, 2009) there are such cases. However, such cannibalizing competition is avoided in North America through the market-driven management of large rail terminals by the large railway company owners. They tend not to invest in inland port projects if the result is a zero-sum game after harsh competition (Rodrigue et al., 2010).

Also any capacity increase at the seaport area that the inland port is directly integrated with would decrease the importance of the functions that the inland port was fulfilling for the seaport (Rodrigue et al., 2010). This point needs to be well evaluated by policy makers and precautions should be taken in order to avoid a possible market share loss of a high public investment like a logistics center.

In order to avoid this conflict governments may interfere and regulate the inland port development processes or just leave the markets to balance themselves through private investments. However, public authorities do have an interest in inland ports because of two main reasons. The first one is the economic development of the region and the second one is related with sustainability objectives and regulating the traffic flows.

There are various feasibility studies for logistics center establishment in different cities of the world (Afandizadeh and Moayedfar, 2008; Tsamboulas and Kapros, 2003; Kapros et al., 2005; Cerreno et al., 2008). These studies all refer to different points that are needed to be evaluated in developing a logistics center. According to Tsamboulas and Tatsi (2010) the development of a logistics center project is also related with real estate development processes. The steps that are required in a real estate development project are presented in Figure 18.

**Figure 18.** Real Estate Development Process



Source: Tsamboulas and Tatsi, 2010: 8.

Aifandopoulou et al. (2006) state that the success of a logistics center development plan is dependent on:

- Knowledge on actors within the system
- Freight potential of the region
- Utilization of existing infrastructure and increasing the capacity
- The positions of logistics center on international transportation networks due to the long distance requirements of intermodal transportation

For the success of logistics facility development, these centers should network with each other in order to achieve the targeted efficiencies in terms of cargo consolidation and traffic optimization (Aifandopoulou et al., 2006). Effective land use is also a very important issue in logistics center development. In areas where

there is a lack of useful land and where area prices are too high, underground logistics centers are considered to be utilized as an alternative solution (Zevgolits et al., 2004). Bremen freight village is a good example for effective land-use for concentrated freight activities. Clustering distribution centers and transport operators in the same area increased the utilization of vehicles in a better way to support sustainable freight transport (Lindholm and Behrends, 2012).

The sequential flow of main processes for the establishment and management of a logistics center can be listed as follows (EEIG, 2004):

1. The identification of infrastructure requirements
2. The structural and functional planning of the logistics center: The facilities that would be located in a logistics center should be identified and their real estate development facilities should be undertaken.
3. Work plan: The management of investments, daily business and future progress should all be planned in terms of process flows.
4. The design and construction of integrated services: The management company in a logistics center is responsible for the construction of all infrastructure depending on the work plan and structural plan of the center.
5. The rental of existing facilities: This activity is again undertaken by the management.
6. The administration of the logistics center: The management of overall commercial activities in the logistics center, management of maintenance and repair of the common facilities in the center.

Different stakeholders take part in the development and establishment processes of logistics centers. The development project can be funded by governments. The land generally is a public area where the development licenses and regulations are managed by public institutions. The parties who are involved in this process may differ depending on the public management policies in the related country. There can be regional actors like state officers, national actors like ministry officers or local actors like municipalities, trade associations and private companies. These actors may take part in different phases of the development process and they may keep sharing the management responsibilities with other founders. For example, the shareholders of the existing logistics centers in EU countries are generally

composed of national and local territory planning public authorities, national and local railway companies, local transport associations, chamber of commerce, banks, insurance companies and industrial associations (EEIG, 2004). It is very beneficial for a logistics center to gather necessary knowledge from multiple stakeholders in terms of demand during its planning phase (Wu and Haasis, 2011b).

On the other hand, these actors may take part in the development and establishment processes but may leave the management of the logistics center company to a private body after the facility is launched. However, even if the management structure is left to a private body, the requirement to stay as a common user facility and to provide a transparent pricing policy are critical for long term success (Bergqvist and Wilmsmeier, 2009). Thus the private company holding all management rights should be controlled by a multi-stakeholder board in order to assure common usage and free competition inside the center.

Logistics centers have a double nature: the infrastructure represents a public interest and the business-orientation inside represents the private interest. The results related with the success of the facility are again twofold: the public benefits like economic development or increased employment and private benefits like competitiveness of the logistics industry. Due to this double nature, Public-Private-Partnerships (PPP) are useful funding systems for both the development and the operation of logistics centers (Tsamboulas and Kapros, 2003).

The European model of logistics center development is generally undertaken by PPPs. PPP is generally defined as *a form of cooperation between public institutions and private companies in order to provide the funding, construction, renovation, management or maintenance of an infrastructure or the provision of a service* (EC, 2004: 3). The private funds are required especially to support insufficient public funds and the constraints on public spending. The private sector existence in such undertakings also increase the efficiency of public services and provide an increased quality to the direct users of these facilities (EC, 2003). The reason that PPP model has been largely adopted by logistics centers in Europe is due to the commercial and thus private nature of these facilities (Tsamboulas and Kapros, 2003).

According to Tsamboulas and Kapros (2003) there are two main types of PPPs: joint ventures and concessions. In joint ventures, public institution and the private company forms a common shareholding company where the risk, the losses and the profits are all equally shared. The concessions are more common in PPPs. Here the public side represented either by a government institution or a municipality grants the construction, operation, management or financing (or maybe all of them) to one or more private companies for a specific time period. Build-Operate-Transfer (BOT) projects are examples to this type.

Public investment is crucial in terms of assuming the initial financial risk but private companies need to contribute to the process with their business management abilities. According to Winkler and Seebacher's (2011) research, the initiators of majority of logistics centers in Germany are public sector representatives. However, in order to ensure private sector inclusion in the process, Freight Village Development Companies (FVDCs) are established with balanced membership among private and public actors. These FVDCs perform different activities like planning and development, sales of logistics center areas, marketing activities or corporate communication / moderation

Generally when a logistics center is undertaken by a PPP, a legal entity is formed and this entity owns the land, constructs the facility, operates the center, executes the negotiations with logistics companies that want to rent or buy facilities within the center. The feasibility of the center is evaluated from the private investment side as long as the project is already beneficial for the society. A PPP project can be considered successful if the private investments are compensated with sufficient profits (Tsamboulas and Kapros, 2003).

Different management types are prevalent in different logistics center examples. Out of the interviewed logistics center organizations for this study, Bremen GVZ stated that they are not interfering with any of the companies located inside the logistics center. They are only running a single office which is responsible from generating innovative proposal for the increased performance of the logistics center. Bremen GVZ is renting all facilities inside to private companies including maintenance and repair services or oil stations. However GVZ-DGG is the German

Association of Freight Villages and they act like an upper authority that creates and disseminates macro policies regarding logistics clusters all around the country.

The Italian freight villages are generally operated by a separate company and their terminals are commonly used by both residents within the center and also by customers located outside the center (Monios and Wilmsmeier, 2012a). In the interview with Verona Logistics Center, they stated that they act like a real estate company that leases the facilities inside the center. There is a board composed of the municipality members, chamber of commerce members, state authorities and private companies. The manager of the logistics center is responsible to this board. The management company is running information and communication infrastructure, maintenance and repair facilities and is selling these services.

The Alameda Corridor in the USA is managed by Alameda Corridor Transportation Authority which has joint powers with the port of Los Angeles (Monios and Wilmsmeier, 2012a). In the USA there are very strong railway companies that are controlling the inland ports and the intermodal terminals within.

No matter which management style they adopt, a higher level authority is essential in logistics centers that coordinates certain logistics activities and protects the interest of the inhabitants, solves conflicts if necessary. Depending on the study of Winkler and Seebacher (2011) out of the 8 logistics centers they surveyed, only four are operated by a coordinating company that deals with synergy generation through joint performance capability or common resource generation. Some of these operating companies run the transportation activities in the center, some handle human resources recruitment and qualification procedures and some manage the social facilities inside the center. Such coordinator companies can also provide benefits in terms of information and technology infrastructure management. IT infrastructure is essential for the effective networking between the firms located in the center and thus fostering cooperation between them. This cooperation can be extended to an inter-logistics center phase where independent centers network with each other for the achievement of better logistics performance.

In the focus group study carried out for this thesis, the participants were generally reluctant about the competition conditions within the boundaries of the center. They were afraid to lose market share or to lose customer accounts to their

competitors if they were to use the same infrastructure and common land. In addition to that, they were reluctant about the customs procedures and smooth transaction through the center due to the existing problems in Turkish customs procedures. The suggestion derived from the focus group session was the establishment of a coordinating ministry for logistics center activities who shall be able to use rapid initiative above the authority of other ministries. These arguments all validate the necessity of a single authority both within the center and also at the state authority level. The management company inside should be there for management of conflict, provision and fair pricing of basic services, promoting synergy among residents and marketing the logistics center to outsiders.

#### **3.3.4.2. Logistics Center and Physical Environment**

Freight villages are also perceived as a part of a sustainable transportation system (Wisetjindawat, 2010). One of the frequently cited advantages of logistics centers is their positive impact on the physical environment in terms of decreased miles traveled on trucks, preference of low-emission transportation modes like railways, increased efficiencies in distribution through consolidation and thus reduced number of vehicles on urban roads.

Implementation of a dry port concept reduces carbon emissions and total transportation costs if the seaport-dry port connections are designed in an effective way (Henttu and Hilmola, 2011). Although logistics related land development incurs an increase in the amount of traffic within the related area (Wagner, 2010), the negative impacts of this increase can be compensated with increased consolidation and reduced number of trucks traveling on highways. One train can replace 35 lorries in European scale. With reduced number of lorries on highways, congestion, road maintenance costs, accidents and carbon emissions can be avoided (Roso, 2007).

Roso (2007) conducts a simulation and modeling study for the port of Gothenburg. She uses the seaport's data regarding the inland locations that the trucks are transporting the containers that they pick from the port. Two models are simulated, one with and one without a dry port. The results show that the carbon emission levels are significantly decreased through the introduction of a dry port and

also, the average waiting time for trucks is decreased at the dry port. Even though the results prove the benefits derived of a dry port, Roso (2007) emphasizes that a dry port is not merely an interface between road and rail and it should be supported with distribution, storage and other logistics services. This converts the dry port into a logistics center and increments its objectives with a traditional supply chain and logistics perspective.

The introduction of logistics centers are also inline with European policies. For example, the consolidation of cargo in freight villages for further distribution to markets resulted in significant decreases in truck mileage which is inline with Urban Goods Transport targets of White Paper on Transport 2001 (ASSESS, 2005).

Thus the introduction of logistics clusters have an environmental perspective and above this a sustainability oriented approach as well. By taking the triple bottomline supporting the overall sustainability concept, the economic success in a logistics center should be supported with environmental and social objectives. Logistics centers deal with environmental and economic problems at the same time by employing synergies between the users and the infrastructure and thus optimal utilization of transport or storage facilities. Wu and Haasis (2011a) relate the successful adoption of sustainability orientation in logistics centers with knowledge management and classification of knowledge flows in strategic, tactical or operational levels.

Wu and Haasis (2011b) divides the overall knowledge gathered from stakeholders for the sustainability of the logistics center into three main headings:

1- Market-specific knowledge: This knowledge is generated from stakeholders like customers, suppliers, intermediaries and networked logistics centers. The timely market knowledge is valuable for operational forecasts and industrial trends.

2- Firm-specific knowledge: This type of knowledge gathers information about the technological infrastructure of daily operations handled by the residents of the center and value-added service capabilities of the members.

3- Society-specific knowledge: This part of the knowledge resources emphasizes the societal and environmental dimensions surrounding the market and thus generating inputs for future policies.

This knowledge collection and analysis is required for the sustainable service design of the logistics center and better management of the gathered knowledge with respect to stakeholder requirements. Wu and Haasis (2011b) relate the necessity of this multi stakeholder approach to Mitchell et al.'s (1997) stakeholder perspective that extends the management's responsibilities beyond profit maximization functions (like stockholders) to other affected or affecting non-stockholding groups.

In the focus group study, one of the participants has emphasized the importance of logistics centers in terms of environmental protection. In a country like Turkey where the majority of inland transportation is handled by road transport, the energy usage and carbon emission levels are certainly very high. The social cost of this transportation network structure is quite high with large numbers of traffic accidents and congested roads. Ports located inside the city like İzmir-Alsancak port or İstanbul-Haydarpaşa port cause excess amount of truck traffic due to drayage of containers to/from the port terminal. Introduction of logistics centers are expected to provide important solutions for these environmental problems as well.

#### **3.3.4.3. Facility Layout**

Determining the physical plan and distribution of facilities in a production system is called the facility layout problem (Singh and Sharma, 2006). This problem has important impacts on materials handling costs, production lead times, work in process and productivity performance (Drira et al., 2007). Kochhar and Heragu (1999) state that in a typical production facility, the manufacturing engineering would decide on the sequence of operations that are required to produce the product mix. The manufacturing equipment is selected based on this sequence and upper management's cost and quality criteria. After these variables are determined, the facility designer develops a facility plan in order to maximize the total output, minimize the total materials handling costs or an optimization of both.

In a logistics center, there are a plenty of different facilities within the physical boundaries of the same facility and these are all designed by their operators. In addition, these facilities all have different objectives. For instance, the warehouses aim to utilize the space optimally while the intermodal transport operator aims to

minimize handling costs and dwell times. A 3PL might want to increase value added logistics services quality and a maintenance operator might just want to increase its sales. So the manufacturing engineering of a logistics center who will decide on the sequence of operations is actually the logistics center management organization itself. They need to design the facilities so that the internal processes are completed in the least possible time with the lowest possible cost for the residents.

Kochhar and Heragu (1999) also point out that today's organizations should be as flexible as possible. The unquantifiable measures like changes in product mixes, changes in market demand should be taken into consideration together with cost minimization or quantity maximization targets.

Majority of the studies on facility location problem is related with factory designs. However, there are also studies related with container terminals, cross-docking centers or industrial parks. For example Yi and Xinxin (2011) offer a facility layout design for a steel industry logistics park depending on the characteristics of the commodity which is steel in this case, functions being performed in the center, the interrelationship of these functions with each other and flexibility opportunities for possible changes in the future. They state that industry specific logistics parks should be designed in a different manner when compared with conventional logistics parks. Bartholdi and Gue (2000) propose alternative facility layout designs for minimizing labor cost during freight transfer in cross-docking terminals. Li et al. (2009) propose a facility layout design for airport logistics park in China. There are few studies focusing on the facility layout problem of logistics centers (Ballis, 2006; Cassone and Gattuso, 2010).

Due to the multitude and variety of operations within a logistics center, it is important to plan the design according to the functions that will be performed in the center. United Nation's Economic and Social Commission for Asia and the Pacific (ESCAP) (2010) lists the types of the functions performed in a logistics center as listed on Table 11. The services that should be performed under these functions are also listed on the table.

**Table 11.** Functions and Services in a Logistics Center

|   | Type                                                     | Function and Service                                                                                                                                                                                                    |
|---|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Transport functions                                      | -Cargo handling<br>-Intermodal or unimodal handling of cargoes and containers<br>-Storage of epty or laden containers                                                                                                   |
| 2 | Warehouse logistics functions                            | -Storage or warehousing of cargoes<br>-Consolidation and deconsolidation                                                                                                                                                |
| 3 | International port functions                             | -Customs inspection and clearance<br>-Functions related to international trade                                                                                                                                          |
| 4 | Customers and drivers facilities                         | -Sanitations<br>-Medicine and emergency                                                                                                                                                                                 |
| 5 | Information technology functions to facilitate transport | -Information systems linking customs/seaports/customers / service providers                                                                                                                                             |
| 6 | Other functions                                          | -Freight forwarding<br>-Information and communication service (such as telephone, fax machines, internet)<br>-Immigration related services<br>-Repairing and maintenance of vehicle and containers<br>-Inland transport |

Source: UNESCAP, 2010: 3

These functions provide insight about the group of facilities that are required within a logistics center. According to the study of Ballis and Mavrotas (2007: 219) for the facility layout design of Thriasio logistics center in Greece, the main criteria that should be considered while designing the facility layout with the logistics center site are:

- *Degree of utilization of the maximum space allocated for building construction*
- *Preferable warehouse sizes and shapes*
- *Cross-docking, direct transshipment option and associated railway access*
- *Way-finding inside the facility*
- *Travel distance from/to the external road network*
- *Traffic density in the internal traffic network*
- *Number of rail-road crossings*

ESCAP (2011: 18) lists the required facilities within a logistics center as follows:

- *Secured are with gate and separate entrance and exit*
- *Covered and open storage areas separated for import, export, transshipment, dangerous and high value cargoes*
- *Customs bonded facilities*

- *Internal service roads and pavements for use in the operational and stacking area*
- *Vehicle holding areas with adequate parking space for freight vehicles*
- *Container, vehicle and equipment repair and maintenance workshop*
- *Administrative building for customs, freight forwarders, shippers, customs brokers, banks and agencies*
- *Information and communications systems and services*
- *Appropriate numbers of cargo and container handling equipment*

With too many different facilities and various organizations with different service production systems within the logistics centers, there should be a macro approach in order to design the layout. All these points that fulfill different functions should be grouped under certain areas which have interfaces with each other where necessary. For instance, there needs to be a truck rail interface for intermodal freight transfer processes. There needs to be receiving and shipping interfaces for all 3PL facilities inside. If the logistics center is integrated with a seaport, there should be an interface between port versus terminal freight transfers.

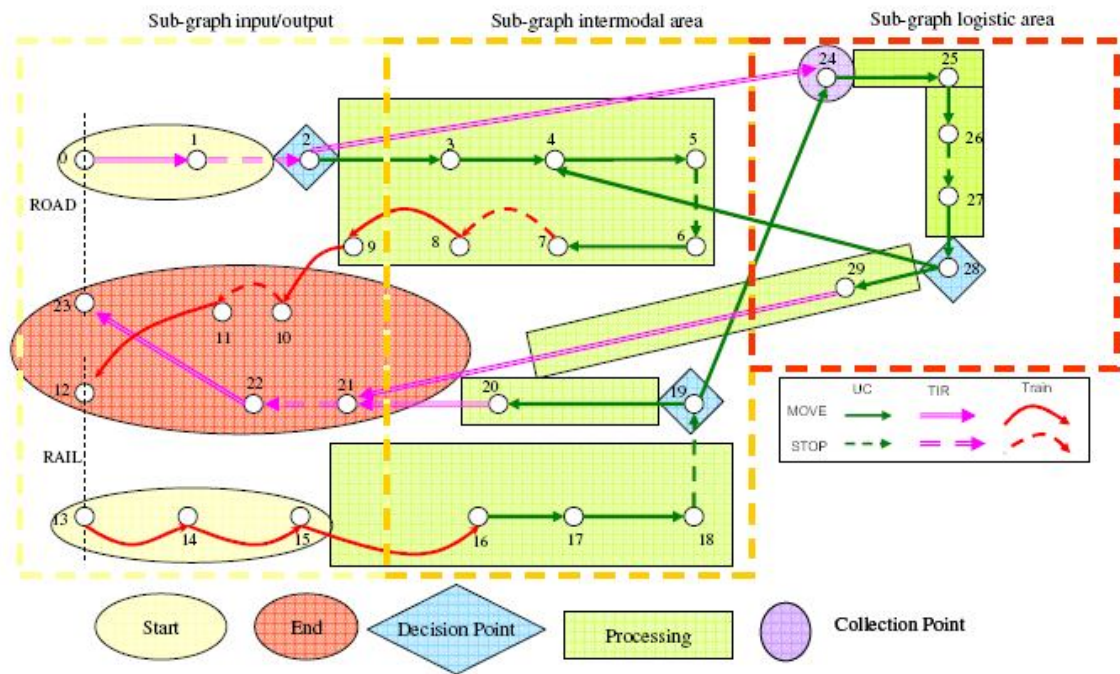
With reference to this aggregation approach, Cassone and Gattuso (2010) divide the overall area of the logistics center into five different subareas:

1. The Intermodal Terminal: is the center of the logistics center where a railway station and a temporary storage facility is available. Here the transfer of freight from/to one mode to/from railways is being realized.
2. The Logistics Area: This place is where the value added logistics services and finishing processes for production are being carried out like labeling, packaging, kitting, consolidation and such.
3. The Administrative Area: Here the management offices of the freight village, the customs or support services like the fire brigade are located.
4. Commercial Area and Services to Personnel: In this area the offices of the residents, restaurants, hotels, banks, port Office and other support services are located.
5. Services to Vehicles: Parking, repair and maintenance, fuel service and such are located here.

They design the facility layout in different representation methods for a container port and a freight village. The sub-graph model represented on Figure 19 is important in terms of showing both the facility layout and the sequence of operations

within a logistics center. Table 12 shows the meaning of flows between various facilities.

**Figure 19.** Example of a Graph for a Freight Village



Source: Cassone and Gattuso, 2010: 80

**Table 12.** Arcs of the Graph of Freight Village Intermodal Terminal

| Link  | Operation                                    | Link  | Operation                             |
|-------|----------------------------------------------|-------|---------------------------------------|
| 0-1   | Entry TIR to freight village                 | 27-28 | Loaded preparation                    |
| 1-2   | Check-in operations                          | 28-29 | Loading on TIR                        |
| 2-3   | Start TIR towards intermodal terminal        | 29-21 | Start towards exit road gate          |
| 2-24  | Start TIR towards logistic area              | 28-4  | Start towards intermodal terminal     |
| 3-4   | Unloading Unit Cargo (UC) to TIR             | 13-14 | Entry train to freight village        |
| 4-5   | Positioning UC in storage area               | 14-15 | Replacement locomotive                |
| 5-6   | Wait in storage area                         | 15-16 | Start train towards operative railway |
| 6-7   | Loading UC on train                          | 16-17 | Unloading UC to train                 |
| 7-8   | Finishing train loaded operations            | 17-18 | Positioning UC in storage area        |
| 8-9   | Start train towards tacking/delivery railway | 18-19 | Storage                               |
| 9-10  | Replacement locomotive                       | 19-20 | Loading UC on TIR                     |
| 10-11 | Wait train                                   | 20-21 | Start towards exit road gate          |
| 11-12 | Routine train on railway                     | 21-22 | Check-out operations                  |
| 24-25 | Unloading TIR in logistics area              | 22-23 | Introduction on road network          |
| 25-26 | Treatment, manipulation, manufacturing       | 19-24 | Start UC towards logistics area       |
| 26-27 | Storage                                      |       |                                       |

Source: Cassone and Gattuso, 2010: 81

The facility layout in a logistics center should be designed in order to achieve the optimization of the logistics chain, the optimization of lorry utilization, the optimization of warehouse utilization and the optimization of manpower in order to decrease total transportation cost, decrease total industrial cost, decrease total cost of labor and increase the total business volume of transport operators (EEIG, 2004).

#### **3.3.4.4. Location Selection**

Facility location selection is one of the most frequently studied areas of logistics center research. Due to the multi-stakeholder structure, cost efficient objectives and supply chain management perspective in a logistics center, the location where the center will be established is of utmost importance.

Significant research has been conducted to find the optimal location for inland terminals (Rutten, 1998; Arnold et al., 2004). Macharis et al. (2011) developed a model for determining the locations for barge/road or rail/road intermodal terminals which includes time factor and several different cost functions. Baohua and Shiwei (2009) developed another model for logistics center location selection under uncertain environment conditions. There are other model development studies for logistics center location selection (Li et al., 2011; Tang et al., 2013). This is a widely studied area of logistics center literature.

According to the study carried out by İzmir Chamber of Commerce (2009), the critical points in location selection for logistics centers are listed as land and infrastructure, geographical position, natural structure, geological structure, quality of transportation services, availability of intermodal transportation alternatives, social structure, urban planning decisions, economic development characteristics of the area, demographic properties, types and volume of surrounding industries.

McCalla et al. (2001) divide the prerequisites for effective facility location into two different perspectives: the user and the supplier perspectives. According to them, the users of a logistics center would prefer that the logistics center is close to related industries, close to the market, has low rental costs and provides intermodal transportation alternatives. The owners or operators of a logistics center would give importance to factors like site and space, access to transportation infrastructure and

accessibility. Tsamboulas and Tatsi (2010) add utilities like water supply, natural gas, electricity, land topography and future expansion possibilities to this list.

There are other criteria for selecting potential logistics center locations (Tsamboulas and Tatsi, 2010: 10):

- *Growth trends: metropolitan areas witnessing increases in population, employment opportunities, and trade are preferred over markets with no growth.*
- *Development climate: both a community's regulatory climate and its attitudes can influence a project's schedule and its eventual size and appearance.*
- *Infrastructure: well-developed infrastructure such as interstate highway systems, airports, rail service, and fully developed utility networks is fundamental to a competitive industrial market.*
- *Available land at a suitable price: an adequate supply of developable land at a reasonable price is necessary for development to proceed.*
- *Labor: an expanding and well-qualified labor force is critical to industrial development.*
- *Development incentives: incentives, such as tax abatement programs and public infrastructure loans, can be used in order to promote the type of development considered desirable for a specific location.*
- *Quality of life: factors which define an area's livability are important for the location of a project.*
- *Current leasing activity: locations that are already attracting the types of businesses targeted for industrial development are preferred.*

Tsamboulas and Tatsi (2010) propose a model for specifying the prioritized locations for logistics centers to be established in a country. According to them, this information will constitute an input for the logistics centers master plan and an effective location selection process will help to the achievement of a national logistics network in connection with global logistics network. The same subject is also studied in Turkish literature by Elevli and Ak (2011), Elgün and Elitaş (2011), Karadeniz and Akpınar, (2011).

### **3.3.4.5. Logistics Centers in the World, in Europe and in Turkey**

#### ***A Global Review of Logistics Centers***

Logistics centers have approximately fifty years of history. The first logistics centers were developed in France, the Sogaris and Garonor centers near Paris, during 1960s. They were followed by Italian and German initiatives in late 60s and 70s. As

of 1980s and 1990s they were a spreading phenomena around Europe (Notteboom and Rodrigue, 2009). They are called as “plateformes logistiques” in France, “güterverkehrszentren” in Germany, “Interporto” in Italy, “freight villages” in the UK, “transport centres” in Denmark and “Zonas de Actividades Logísticas (ZAL)” in Spain (Meidute, 2005a; Iannone et al. 2007). Freight villages are generally called Inland Ports in the USA (Ballis, 2006). So even the name of the facility differs depending on the country that it is located.

In Japan, logistics centers are called Distribution Parks. They have a United approach to establish and develop these parks together with enterprises, associations and the government. The associations are formed by groups of enterprises. They generate funds through joint stocks and the rest of the required funds are sourced by the government in order to attract private sectors investment in the distribution parks. The enterprises here are also the customers of the logistics base (Zhou and Shao, 2005; Cited by Xiuli, 2009).

In Germany, the development of logistics centers is different. The Federal Government executes the overall planning process, the State Authority finances the construction process and the enterprises administer the daily operations themselves. All of the facilities located inside the centers are run by different companies. The logistics center organization does not interfere with daily business. The logistics centers in Germany are managed by an association which is called the German Association of Freight Villages (DGG) and this association has individual consulting companies inside the logistics center that seek innovation potentials, project ideas and development opportunities for the logistics center<sup>6</sup>.

Rodrigue et al.'s (2010) research states that the drivers of inland ports are different among European and American examples. While they are developed mainly by big seaports in Europe, rail operators and real estate promoters are major actors in the development of American inland ports.

A comparison study among European logistics centers has been carried out by Izmir Chamber of Commerce. The study provides brief information about 19

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<sup>6</sup>This information is gathered from the interview carried out with GVZ Bremen.

different logistics centers in Europe like location, area, future expansion, employment levels, services and ownership (IZTO, 2009).

In China, logistics centers are called logistics bases where physical distribution and logistics facilities are gathered in order to provide integrated services. According to Xiuli (2009) there are more than one hundred logistics bases of which the majority are located on the Eastern part on the coastal regions rather than western inland parts.

Some of these logistics bases are pure public investments, some of them are initiated by private enterprises and some of them are partnerships between local private enterprises and strategic overseas investors. However there are various problems regarding the logistics bases in China. These are listed as (Xiuli, 2009):

- a poorly established state policy on logistics land use and logistics bases,
- variety of tax and policy regulations against logistics facilities in different regions of China,
- lack of scientific demand analysis during the planning and construction phases of the logistics base,
- scattered structure of the governmental organization in terms of logistics activities.

Out of the nearly 1000 logistics center investments that were initiated in China after 2001 as a fashion trend, nearly 60% has been left idle after their completion due to oversupply (Notteboom and Rodrigue, 2004).

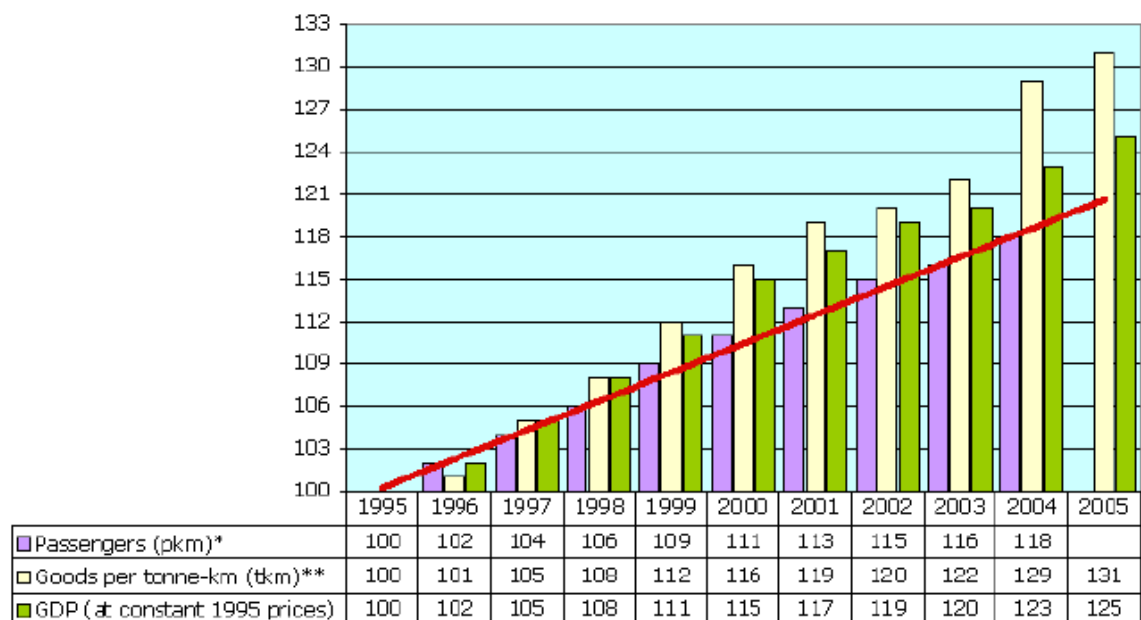
### ***Logistics Centers in Europe***

Depending on the report prepared by European Foundation for the Improvement of Living and Working Conditions - Eurofound (2008), transport and logistics industry are key sectors in economic growth. Figure 20 shows that movement of people and freight is positively related with the growth of GDP in Europe. The industry employed 7,7 billion people in 2006 and in EU25 countries. The largest share of turnover within the industry is derived from cargo handling,

storage and other auxiliary logistics activities. The second row is occupied by road transport of freight and passengers.

Although the balance between transport modes is strongly encouraged by public authorities (EC, White Paper, 2001) the share of road transport is still very high due to the incompetence of rail and water transport systems in terms of logistics flexibility and responsiveness demands. A major problem related with railroads is the national infrastructures and public management that forces freight to be transshipped between trains at European borders (Eurofound, 2006).

**Figure 20.** Relationship between GDP and demand for transport, 1995–2005



Source: European Commission, Directorate-General for Energy and Transport (DG TREN), 2006: 3.1.2.

The European transport and logistics clusters are generally connected on the trans-European network for transport (TEN-T) which is a network that includes all modes and aims to provide the most appropriate mode for the applicable parts of the freight journeys carried on itself. By 2020, TEN-T is expected to include 89.500 km of road, 94.00 km of railways, 11.250 km of inland waterway system supported by 210 inland ports, 294 seaports and 366 airports (Eurofound, 2008).

Best practices of logistics clustering in Europe and the world are shared in several studies. Germany's cluster model for freight villages and best dry port examples from different parts of the world (Ruesch, 2011), European and North American good examples (Rodrigue et al., 2010) can be followed to gain inputs for new initiatives.

### ***The Turkish Literature and Practice of Logistics Centers***

After the success and well covered recognition of logistics centers in EU member countries, initiatives are undertaken in new member countries in order to enhance transportation and logistics policies of the EU to the new borders. However, it is quite difficult to establish these successful examples in new members especially due to the contest between the existing terms and definitions that complicate the unified understanding of the concept (Jarzetskis, 2007). First of all a standardization of logistics center facilities are required and the minimum requirements to develop a logistics center should be specified in order to manage the expansion of these facilities to new member or candidate countries.

The benefits of logistics centers were mentioned in the logistics clusters part. Due to their economic development impact, public authorities are generally eager to develop such facilities in new member or candidate states. As a result of Wilmsmeier et al.'s (2011b) study, it is stated that existence of policies encouraging proactive behavior regulates the direction of the development of inland ports. Ng and Gujar (2009) mention that generally the development of inland ports in developing countries show an inside-out trend. It is the same in Turkey where majority of the existing initiatives are driven by land-side actors although Turkey is not a landlocked country at all.

In Turkey, some ports are still being operated by public authorities and some ports are being operated by private companies. Existing initiatives for the development of inland ports are mainly coming from the public sector (National Railways) due to the monopolistic structure of railways. Turkey's first logistics center was developed and started operations in 2007 in Samsun-Gelemen (Elgün and Elitaş, 2011) and it is run by Turkish National Railways. However, the few private

initiatives like MOS Lojistik, Ankara Logistics Zone are driven by inland actors like manufacturing industries or trucking companies. Although the port representatives that have been interviewed throughout this study emphasize their wish to cooperate with inland facilities like freight villages in case they are actively operated, for now they do not invest in such initiatives. So it may be concluded that the direction of the development for inland ports in Turkey are inside-out.

The most active actor in the development of Turkish logistics centers is Turkish National Railways. The current plans and the locations that have been chosen for logistics center establishment are announced through its website and is shown on Figure 21.

**Figure 21.** Logistics Center Locations in Turkey



Source: TCDD, 2010,

<http://www.tcdd.gov.tr/Upload/Files/ContentFiles/2010/yurticibilgi/lojistikloy.pdf>

All these areas are chosen depending on their manufacturing and consumption patterns and locations against existing railway infrastructure and seaports. A summary of each location together with the private logistics center initiatives are listed on Table 13.

**Table 13.** Logistics Center Initiatives in Turkey

| Location <sup>7</sup>                        | Area                     | Target Throughput | Main Traffic                                                                                                                                                                              |
|----------------------------------------------|--------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gelemen – Samsun                             | 330 decares              | 1.100.000 tons    | Iron, scrap, copper, coal, timber, wheat, flour, fertilizers and food                                                                                                                     |
| Hasanbey - Eskişehir                         | 630 decares              | 566.000 tons      | Tiles, feldspat, iron, ceramic products, construction equipment, white goods, container, food, water and coal                                                                             |
| Gökköy – Balıkesir                           | 200 decares              | 1.000.000 tons    | Automobiles, container, marble, foodstuff, fiber ans synthetics, military goods, iron ore<br>Also integrated with Tekirdağ-Bandırma train-ferry Project, Bakü-Kars-Tiflis railway project |
| Boğazköprü – Kayseri                         | 1500 decares             | 1.782.000 tons    | Iron, pipe, furniture, rubber tyres, military goods, mines                                                                                                                                |
| Köseköy – İzmit                              | 765 decares              | 1.500.000 tons    | Automobiles and spare parts, petrochemicals, mines and raw materials, steel rolls                                                                                                         |
| Halkalı – İstanbul                           |                          | 2.000.000 tons    | International customs door, RO-LA connections                                                                                                                                             |
| Yenice - Mersin                              | 640 decares              | 896.000 tons      | Machinery, spare parts, cotton, iron, steel, chemicals, packaging material and various mines                                                                                              |
| Uşak                                         |                          | 246.000 tons      | Ceramics, blankets, yarn, marble, plastics raw material, foodstuff                                                                                                                        |
| Palandöken – Erzurum                         | 327 decares              | 437.000 tons      | Automobiles, flour, iron, steel, bricks, fertilizers, foodstuff, water<br>Silk Railroad Project                                                                                           |
| Kayacık – Konya                              | 300 decares              | 1.679.000 tons    | Foodstuff, fertilizers, sugar, agribulks, military goods                                                                                                                                  |
| Kaklık – Denizli                             |                          | 500.000 tons      | Marble, textiles, coal, container                                                                                                                                                         |
| Bozüyük – Bilecik                            | 132 decares              | 1.900.000 tons    | Trimodal, close to Gemlik port, integrated with organized industrial zone                                                                                                                 |
| Others                                       |                          |                   |                                                                                                                                                                                           |
| Hadımköy & Tuzla – İstanbul Municipality     | 1097 hectares – Hadımköy |                   | Clustering existing warehouses and TIR parks in both sides of İstanbul, urban distribution and collection, industrial park                                                                |
| MOS Logistics – Manisa (Private)             | 320 decares              |                   | Manisa Organized Industrial Zone – İzmir port traffic by railways, mainly containerized white goods                                                                                       |
| Ankara Logistics Zone (Private) <sup>8</sup> | 700 decares              | 2500 trucks / day | Currently unimodal – motorways<br>Railway connection is targeted                                                                                                                          |

<sup>7</sup>Table is developed by the author from Karadeniz and Akpınar (2011). Türkiye’de Lojistik Köy Uygulamaları ve Yeni bir Lojistik Köy Önerisi. Marmara Coğrafya Dergisi. 23 (Ocak): 49-71.

<sup>8</sup>Information related with Ankara Logistics Zone is sourced from the organization’s official website: <http://www.ankaralojistikussu.com/>.(07.12.2012).

An example of a logistics cluster formation in Turkey can be observed in Hadımköy İstanbul which is among the pilot areas where a logistics center is considered to be established. Many logistics companies, 3PLs, warehouse operators are executing their operations around this location. The logistics center is planned by Istanbul Metropolitan Municipality and it is to be positioned within a larger industrial cluster where a serious volume of activity in automotive, machinery, textiles, aluminium, packaging, chemicals and similar various industries take place (Karakuyu, 2010). This industrial activity has attracted many logistics companies to the location, however, they are currently dispersed and operating individually. Also Hadımköy is close to İstanbul city center but located outside the urban traffic density. The logistics centers located close to a large city are considered to solve urban problems like traffic congestion, regional competitiveness and quality of life (Ballis and Mavrotas, 2007). This facility has the same objectives for its peripheral area. The location is connected to the E-5 and TEM motorways, Ataturk Airport, Ambarlı Seaports and Sirkeci-Europe railways (Karakuyu, 2010) so a multimodal infrastructure is ready to be utilized. Nevertheless, the logistics center should be connected to these transportation chains in an efficient way.

The reasons of the slow pace of logistics center development in new member states are listed by Jarzanskis (2007) and they are similar with the problems in Turkey which is a candidate country. Already having been mentioned by the focus group participants, pricing competition within the logistics center among traditionally small road hauliers or freight forwarders is a barrier for them to invest in such a center. Complex service pricing is important for the final customer of the logistics center who requires a combined service that covers customs, warehousing, road haulage, railway transport, intermodal transfer and packaging for an example. As in a logistics center these operations are undertaken by different members, a price increase in one of these activities would incur the total price to increase and the final customer to choose an alternative outside the center. Long planning periods, heavy bureaucracy, lack of legislation during planning phase are barriers against private companies who generally rely on short term profits. Unavailability of public private partnership regulations, the conflict of interests among these two types of

organizations and lack of funds to undertake such big investments are also among other barriers.

According to former studies, the share of logistics in developed countries is between 12% and 15%. However, unfortunately in Turkey this rate is not able to be calculated scientifically including all the logistics activities carried out by different industries. When the 2008 numbers are examined, it is seen that the sum of warehousing, transportation and communication in GDP constitutes 13% of the overall GDP. When the communication activities are subtracted, an 11% rate can be forecasted for the share of logistics industry in the overall GDP (Tanyas, 2011a). The overall size of the Turkish logistics market is forecasted to worth USD 85 billion and the share of LSPs is calculated as USD 35 billion (Tanyaş, 2011b).

The logistics industry shows a promising development depending on the Logistics Performance Index (LPI) numbers and foreign companies are investing in Turkish logistics sector either through acquisitions or strategic alliances. LPI is an index that is developed by the World Bank in order to measure and compare the size, the growth rate, the quality and the pace of the logistics industry in different countries. Turkey has been on the 34th row in 2007 when the index was published the first time. Then, after a decline to the 39th row in 2010, Turkey climbed up to 27th row on the last index which was published in 2012 (Koban, 2013). Many global 3PL companies have agency agreements with Turkish LSPs. The big players like DHL Forwarding, Kuehne Nagel, Expeditors, Schenker have a long standing existence in Turkish logistics market.

The weakest point in Turkey's transportation system is the unavailability of intermodal terminals and connections between transportation modes. The existing system is being managed and financed by each transportation mode separately and this creates a blurred region of authority in terms of achieving intermodality (Kaynak and Zeybek, 2007). The logistics system is highly dependent on land transportation and road hauliers form the most powerful actors in national transportation network. The seaports are not integrated enough with their hinterland. They are generally focused on on-site activities and not interested in logistics center initiatives for now. However they lack the necessary expansion area so they are in need of free space which may be supplied by inland ports.

The impact of railroad transport on the development of logistics centers is undoubtedly very important due to the requirement of an intermodal facility on land. The preference of railroads for the long haul part of land transport is certainly a challenge for road transport operators whom are afraid to lose their market share especially in countries like Turkey where road haul has a significant power in both domestic and international transport. That's why it is important to convince road transport operators regarding the benefits of intermodal transport and motivate them to use this option. In a recent study by Woxenius and Bergqvist (2011) it is defended that if the intermodal transportation system is designed in an effective way that integrates transport units with railroads, the semi-trailer carriers will also benefit from intermodal transportation. This is an opportunity to include road hauliers in the logistics center's service context. They would agree to participate if they could benefit from cost advantages especially in countries like Turkey where they suffer from high taxes on oil prices.

Due to the existing power of land transportation operators in Turkey, the inside-out private initiatives of logistics centers may be driven by them as well. This is the case in Ankara Logistics Base. However, without an intermodal terminal, the scope of the activities and the cost advantages would not match with the European counterparts. The other inside-out initiatives run by Turkish National Railways are unable to proceed due to bureaucratic barriers and slow pace of infrastructure development.

The second strong players, the shipping lines, are investing in initiatives where they will be able to provide door-to-door services in Turkey with a through bill of lading. MSC, the leader of the international shipping sector in Turkey, has established a logistics subsidiary called MEDLOG and it is expanding operations in Anatolia through MEDLOG offices. In a recent interview, an officer from MSC stated that keeping maritime transportation as the focal business, the shipping line wants to enlarge its services in all transportation modes in order to offer door-to-door solutions. Similarly, the largest Turkish shipping agency, Arkas Lines and Shipping Agency, has been opening offices all around Anatolia in order to provide combined logistics services to its customers. These companies are also investing in rail cars in order to get prepared for the frequently mentioned privatization of Turkish National

Railways. So private companies are positioning themselves against future challenges in Turkish logistics sector.

The shipping lines have already established some strategic alliances with inland container terminals. These terminals are either using railway connections (e.g. Egeport) or using drayage systems (e.g. Ardep) with ports and they offer better rates to shipping lines for container stuffing, empty container storage, container cleaning, lashing or similar terminal services. However, the rates for the end users do not change especially when the connection is made with a state port like Izmir Alsancak port. These inland container depots work like extended gates for seaports and they diminish the congestion at the port site. They can be an example for outside-in development but the integration desire does not come from the port authorities. Instead they come from shipping lines that suffer the most from congested port areas.

These shipping lines may decide to invest in logistics center projects in order to use their container facilities or intermodal facilities. However, in terms of logistics centers, one of the most important points is the availability of free competition and common services. If the rates are controlled by a private company that is also in competition with all the other potential members of the logistics center, like 3PLs, this would create a disaster in terms of the operability of the center. Logistics centers should let even the smallest players an opportunity to utilize intermodal transportation and shared services in order to increase the quality of their logistics services. Thus, the German or Italian models of management by public and private partnerships that protect the rights of all stakeholders are considered to be more appropriate for Turkish logistics centers.

Turkey with its strategic position between Asia and Europe, is a country that has a logistics base potential if the existing logistics opportunities are wisely utilized (Kara et al., 2009). Logistics centers are on the agenda of the country since 2006 and as can be followed from Figure 21 and Table 13, there are many initiatives for logistics center establishment. A content analysis study which analyzed the industrial journals published by sectoral associations between July 2006 and July 2011 shows that the interest towards logistics centers has increased in time (Altuntaş and Tuna, 2012). The aim in establishing such facilities is to remove logistics activity from cargo terminals which remained in busy urban centers, to freight villages located on

areas that are effectively connected to international and national transportation systems.

The same content analysis study also shows that logistics centers are most frequently mentioned together with railway transportation terms (Altuntaş and Tuna, 2012). This is due to the existing initiatives undertaken by Turkish National Railways and also the necessity of an intermodal terminal within a fully functioning logistics center. However, although the current initiatives listed on Table 13 are large in quantity, they are not equipped with the necessary asset clusters that would let them utilize cost efficiencies or shared synergies. Functionality of logistics centers in terms of legislation, location and infrastructure should be considered in priority rather than the quantity of logistics centers in Turkey. The variety of the existing initiatives, the inappropriate location selection decisions for logistics centers and the lack of preventions regarding the impacts on urban transport are causing hesitations in the Turkish logistics industry (UTIKAD, 2007). Development alternatives and expansion possibilities are dependent on regional, national and international logistics capabilities of the selected logistics center areas. Therefore the spots for new initiatives should be selected carefully and by the involvement of all stakeholders.

There are several studies that explore logistics centers in Turkish literature. In addition to the conceptual reviews (e.g. Aydın and Ögüt, 2008; Elgün, 2011), Elgün and Elitaş (2011) conducted a study on Turkish North-South transport corridors in order to locate the best alternative spots for a general, a regional and an international logistics center by employing four main criteria: transportation connections, business facilities, land characteristics and location characteristics. Eryürük et al. (2011) conducted a study for the design of a logistics center specialized for clothing industry in Turkey. They explored the logistics cycle of the clothing industry, required production services, required logistics services and the management type of a potential logistics center specialized in clothing industry. Elgün (2011) group the services and characteristics of logistics centers under four classes: support services, technical services, physical characteristics and basic general properties. Karadeniz and Akpınar (2011) review the existing logistics center initiatives in Turkey and offer Trabzon as another candidate for the establishment of a new logistics center.

Elevli and Ak (2011) have introduced the methodology where fuzzy AHP can be used in order to specify the location of a logistics center in Samsun area. According to their study, due to the vagueness of the location selection problem and the importance of the personal and subjective views in such an analysis, it is important for the reliability of the research results to convert personal views into numbers and employ mathematical analysis.

A market research has been held for the logistics center that is to be established in Hadımköy-İstanbul. According to the study that Karakuyu (2010) has undertaken, the logistics companies located in Hadımköy chose this point due to its locational advantages (44%), because the land is owned by them (36%) and due to ease of accessibility (11%). It is observed that the majority of the problems of these companies are related with other factors and not with the location at all (56%). These other factors are mentioned as oil prices, competition, insurance rates etc. 16% of the problems are linked to the inadequacy of infrastructure and transportation capacity, 8 % with environmental pollution and 4 % with security problems. It can be seen that the “Other Problems” are all related with costs. So a logistics center formation and its synergy potential may decrease the disadvantages of competition and may create a better utilization of resources, thus reduce these costs for individual companies.

To summarize, there is a serious interest in logistics centers by Turkish state authorities and private initiatives and there is plenty of development plans in many locations. However, too many logistics bases may cannibalize the existing demand and miss the cost efficiency target of a logistics cluster. Because the development of inland ports has become a popular tool for gaining profits through real estate development and enhancing regional development through increased employment, in some places they are established without considering commercial viability or operational practicality (Rodrigue et al., 2010). Xiuli (2009) gives the example of the cities around Yangtze Delta in China and emphasizes that nearly every city established its own logistics base specializing in a different transportation mode or a different industry. In Turkey, there are different projects being undertaken by different entities in the same cities or close destinations which may result similarly. An extensive and scientific demand analysis should be undertaken in order to know the required number of and the required services from logistics centers.

Like it is in China, in Turkey different ministries are in charge of the different logistics activities that are required to take place in a logistics center. Ministry of Transport, Maritime Affairs and Communications, Ministry of Foreign Trade, Ministry of Economy, Ministry of Customs and Trade are all authorized regarding the different activities of a logistics center. This situation creates a hesitation in potential residents of the center as they expect high level of bureaucracy which can ruin the seamless flow in today's highly demanding supply chains.

It is essential for logistics centers to be planned with a systems approach by considering all the sub-systems that would effect the processes in the center. Especially the interlink between seaports and logistics centers should be carefully analyzed. The existing initiatives that are introduced by Turkish National Railways show an isolated approach to logistics centers and they lack a holistic plan integrated with Turkish seaports. Also before developing a logistics center, a perceptual survey should be undertaken with industry representatives, exporters and importers in order to control the market potential (Kaynak and Zeybek, 2007). The aim of this study is, similarly, to explore potential customer requirements from a logistics center and thus contribute to the industrial service design in a logistics center to be established in Turkey.

#### **3.3.4.6. Concluding Logistics Centers**

Logistics centers are established facilities in developed countries of Europe and North America. However, they are quite recent initiatives in developing countries. Considering the highly globalized structure of production today, the efficiency of logistics networks is not expected to lose its importance in the near future. Decreasing the costs solely is not enough for today's customers. They want complex services at competitive prices combined with flexible alternatives and smooth logistics processes. Developing countries that compose an essential part of global supply chains can not ignore these demands. That's why, logistics centers will be on the agenda of these countries during the forthcoming years as well.

In the case of Turkey, one of the biggest advantages is its proximity to consumption nodes when compared with offshore production alternatives in Far East

or India. As already mentioned in Simchi-Levy et al.'s (2012) recent prediction, due to the increasing energy costs, the current dispersed structure of global collection and distribution networks will transform to a more proximate version. Logistics clusters will be required at strategic locations which are close to the final consumption markets and industrial activity around these clusters is expected to increase. These developments are fruitful opportunities for Turkish initiatives on logistics centers.

According to Roso et al. (2009) when the dry port concept is well adopted, the freight on road will be transferred to more environmentally friendly modes, relieve the congestion in seaports, incur more efficient cargo handling in seaports and offer integrated logistics solutions for shippers or receivers located in the hinterland of the port. Enhancing dry port facilities with value added logistics services and other logistics activities would increase the competitiveness of Turkish ports as well. So an integration between the seaports and the hinterland organizations should be established in order to increment the performance of a future logistics center.

However, as mentioned in previous sections, the logistics center investments in developing countries are seen as a public development tool. This creates a multitude of similar facilities in very close locations with each other. The developers do not consider the operability and sustainability of these facilities sufficiently. This causes a cannibalization of similar entities in the end which also incurs the loss of large public funds. That's why it is very important to plan all possible costs and revenues ahead of the investment decisions. The authorities that make the investment should be sure about the future performance of a logistics cluster in terms of market success.

The performance of a logistics center highly relies on location and operation of various companies within the center, their relationships with the logistics center and the use of services offered by the logistics center to its inhabitants (Meidute, 2006). These factors would create opportunity for market success and sufficient revenues.

Meidute (2006: 372) lists the revenues of a logistics center as follows:

- *Rental of warehouses, storage spaces and offices*
- *Rental of outdoor spaces for cargo placing*
- *The administrative rights of hotel and restaurants inside*
- *Fee on the revenues of the gas station*
- *Charges on operations of the intermodal terminals*

These revenues may be estimated by either taking the company approach and estimating individual company operations and service demands, or by taking the traffic units approach and measuring the potential traffic flows through the center. Traffic units potential can also give an idea about the space and services required (Tsamboulas and Kapros, 2003). However, before that a facility that all potential users would demand to invest should be designed. This depends on not only the physical layout but also the industrial service design.

The revenues will be generated from the future inhabitants of the center who are the users or customers of this facility. As the transaction between a logistics center organization and the 3PL who invests in logistics center facilities is a transaction in the industrial market, these customers can be called as industrial customers. The market offering in this transaction is the industrial service that the logistics center sells which is a complex service with real estate provision, maintenance support, consulting, infrastructure services or others.

The problem with inland ports is that both public and private authorities overestimate the benefits and underestimate the costs and externalities of them (Rodrigue et al., 2010). This situation also supports the requirement of a well covered and multi-dimensional market research regarding the traffic potential, the supply chain connections, the available land, the urban structure, the costs, the potential revenues and the customer expectations.

In order to secure a future flow of revenues, these industrial customers should be targeted during the industrial service design in a logistics center. The potential customer of the logistics center evaluates whether an integrated transport chain through the center produces cost savings, enhances reliability, decreases transit times and improves quality (Konings, 1996) Therefore the customers are the real decision makers for logistics center operators (Tsamboulas and Kapros, 2003). Their requirements are essential in order to tailor the complex service according to market demand and assure future market success.

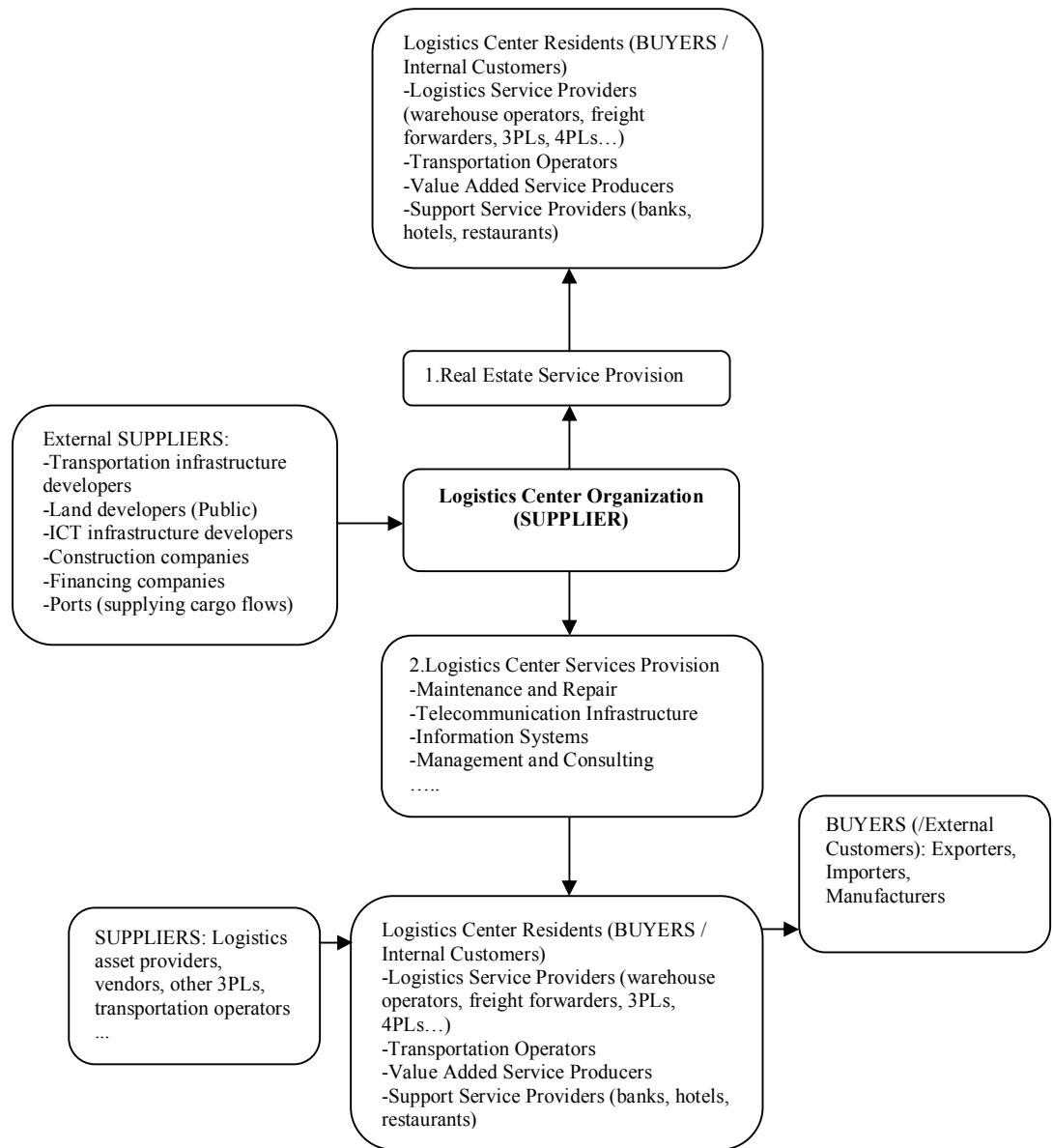
The most important input at this stage is the customer evaluation criteria of a logistics center. Eckhardt and Rantala (2012) state that the location of the center in comparison with the physical collection and distribution network of the supply chain is a crucial criteria in this process. Another important point is the evaluation of

existing facilities and their operation in terms of industrial service supply by the industrial customers of a logistics center. They provide this industrial service supply to the outsiders like exporters, importers or local manufacturers. A representation of this industrial supply chain is shown on Figure 22.

Not a broad supply chain but a vision of multi-tier structure of inland ports has been drawn by Rodrigue et al. (2010). They divide the functional relations of an inland port into three main tiers. Tier one is the terminal itself with the cargo capacity and its performance as either a satellite terminal close to a seaport, a load center stuffing or destuffing containers or other boxes or a transmodal center where units are transferred either within or between modes. Tier two is the logistics activities produced by the terminal which are divided into four headings such as consolidation, transloading, postponement and light transformations. These are produced by the residents of the facility mainly. Tier three is the retailing or manufacturing activities that are providing inputs to or using the outputs of second tier.

Figure 22 represents these tiers, the focal organization and the linkages between them. The focal organization is the logistics center itself that has two main functions: real estate services provision and logistics center services provision. Both of these services are bought by the first tier customers which are the residents inside the logistics center. They have external customers which are composed of the importers or exporters that buy industrial services from these residents and they are called the second tier customers.

**Figure 22.** Industrial Service Supply Chain in Logistics Centers



Not a broad supply chain but a vision of multi-tier structure of inland ports has been drawn by Rodrigue et al. (2010). They divide the functional relations of an inland port into three main tiers. Tier one is the terminal itself with the cargo capacity and its performance as either a satellite terminal close to a seaport, a load center stuffing or destuffing containers or other boxes or a transmodal center where units are transferred

These second tier customers and the products that they manufacture or sell are very important in terms of the industrial service design. Today's logistics systems

that the globally produced and distributed products are flowing within should be consistent with the demands of the products that they carry or hold. That is because the final customers do not make any distinction between the product or the logistics system that supports it (Eckhardt and Rantala, 2012). They only evaluate the value that they derive from this final product together with all the benefits they receive through it. The common service of logistics centers is designed not for only the residents located inside the facility but also for external users like shippers, producers or importers (Tsamboulas and Kapros, 2003). This means that the logistics systems should be well aware of the needs of these products or the industry as a whole and align their facilities, operations, processes accordingly.

An efficient logistics center requires well established coordination among the stakeholders that are involved somehow in its operations. In any supply chain, companies decide to partner with entities that can add value to the overall benefit of the total chain (Tsamboulas and Tatsi, 2010). A logistics center, thus, needs to consider the supply chains it serves and try to add value to their overall offerings. Similar with distribution centers that are critical nodes influential on lead times through their ability to quickly respond market demand (Baker, 2004), logistics centers should be designed in such a manner to align operations with global supply chains that pass through their facilities.

The way that the industrial supply chain passing through the logistics centers will be managed is an issue of question due to the multi actor structure of the chain (Bontekoning et al., 2004). Taylor and Jackson (2000) defend the idea of a chain leader that is represented by the most powerful member of the chain should execute the management role for the intermodal transportation chain. In international chains, ocean carriers whom are the most powerful ones, have generally taken this role however in domestic chains the terminal operator (Wiegmans et al., 1999) may perform leadership duties due to the economic power. An example of this situation can be seen in the USA where railway transportation is controlled by 4 or 5 large private enterprises. Inland terminals in the USA need to cooperate with these railroad operators in order to secure seamless intermodal transportation.

As already mentioned in previous sections, logistics center research has gathered around different topics like location selections studies, conceptualization

efforts or case studies. Although the importance of stakeholder involvement or the exploration of customer preferences have been emphasized by a few scholars, the existing studies that evaluate them from this perspective are very few in number. Out of the few studies, Stank and Roath's (1998) effort is the first to explore shipper preferences in logistics facility development. In this study, they do not mention the word logistics center but they use a more general term: intermodal transportation and logistics facility. They start with the development of intermodal transportation by market demand and the rise of Intermodal Marketing Companies (IMCs) which are intermediaries that promote and coordinate the intermodal transportation operations between the operators and the shippers. This development also faces with several challenges resulting due to the high infrastructure, capacity and coordination requirements among many partners that take role in intermodal transport operations. Developing intermodal transport and logistics facilities without a solid investigation of market potential may result in idle facilities.

So in order to explore shipper preferences, the manufacturers located around the pilot area that the research was held were surveyed about their ideas related with an intermodal transport and logistics facility, their importance rankings and their likely usage rates regarding the services in such a facility. The results state that such a facility should both bring enhanced services together with cost advantages in order to be preferred by shippers. Also such a facility should not be equipped with full service in the beginning but should design initial services aligned with the demands of the favorable market segment in the coverage area. This favorable market segment would secure the required demand in order to initiate the economies of scale in the facility and attract smaller companies for purchasing facility services (Stank and Roath, 1998).

Stank and Roath's (1998) study was an exploratory effort and was followed by only two empirical studies which again targeted North America as the research setting. Walter and Poist (2003) conducted focus group sessions and literature reviews to reduce existing services in inland ports to twelve main groups. Manufacturing companies and carrier companies located in the region were surveyed about their importance rankings and anticipated usage rates regarding these twelve groups. The results showed that it was the carriers who, mainly, perceive an inland

port and its service more important for their operations and they were more likely to use these services. A general agreement between shippers and carriers was about the importance of a web site that would link certain intermediaries together and distribute trade and transport related information. So the North American setting emphasizes the importance of an e-port in the land side first. A second result of this study concludes that promotional and educational activity is required in order to foster inland port usage.

Walter and Poist (2004) propose other results related with only the shipper side of inland port usage and they conclude that internationally focused manufacturers perceive an inland port more important and are more likely to use such a facility's services when compared with domestically oriented manufacturers. So they state that the target market of an inland port is composed of international shippers that engage in exports or imports.

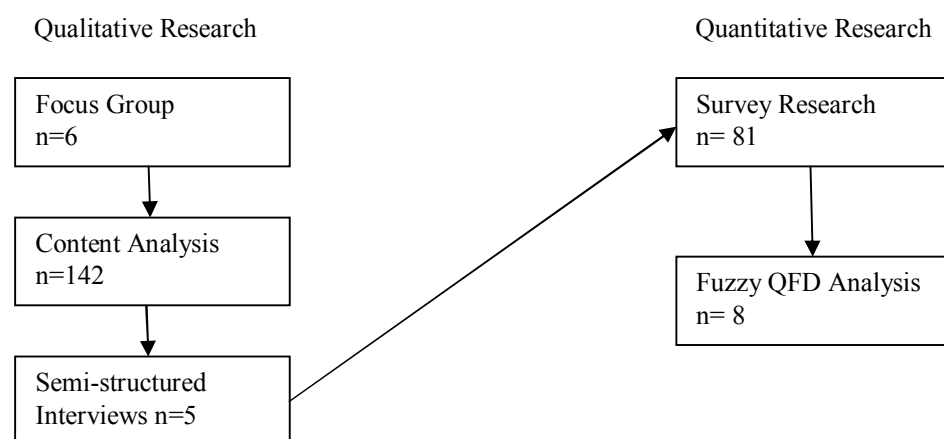
There are various conceptual studies about the evolution of inland ports which are evaluating the concept from port development perspective or definition perspective. There are other studies that aim to conceptualize the logistics cluster types by comparing different examples from different parts of the world. However, a very limited number of studies take a marketing perspective to explore logistics center development. To the best of the author's knowledge, no studies take this marketing perspective to prioritize the industrial service dimensions of a logistics center. A thorough market analysis and community outreach are very important while developing an inland port (Prozzi et al., 2002). The aim of this study is to accomplish this by matching customer requirements with technical capabilities. The forthcoming section presents the triangulated research effort in order to achieve this aim.

## SECTION 4

### RESEARCH ON INDUSTRIAL SERVICE DESIGN CRITERIA IN LOGISTICS CENTERS AND THE PRIORITIZATION OF INDUSTRIAL CUSTOMER PREFERENCES

As already mentioned in the introduction section, the methodology adopted in this study is a triangulation effort that combines qualitative and quantitative research methods in order to answer the research question. The qualitative research process includes a focus group study, a content analysis study and several semi structured interviews that aim to explore the dimensions related with the industrial services prevalent in a logistics center. The focus group study and the content analysis study were also presented in two different academic conferences and the content analysis study was also published by a national peer-reviewed journal on marketing (Altuntaş and Tuna, 2011a; Altuntaş and Tuna, 2011b; Altuntaş and Tuna 2012). The suggestions and the evaluations received in these conferences were included in the study as valuable inputs and supported the research process. The overall research process, which is a two-step or sequential triangulation (Creswell, 2003) is briefly represented by Figure 23.

**Figure 23.** The Triangulated Research Process



## **4.1. QUALITATIVE RESEARCH**

The qualitative research part in this study had three different stages which were held sequentially. Focus group study, content analysis study and semi-structured interviews were utilized in order to explore all the dimensions of the industrial services that should be prevalent in a logistics center. At this stage, the existing examples of logistics centers were included in the study in order to understand their structures. Representatives from different activities of logistics industry, from logistics associations and institutions and the published resources are chosen in order to cover all the aspects related with logistics center services in terms of the potential industrial customers' perceptions. The results of the qualitative research were used as inputs for the survey research at the quantitative research stage.

### **4.1.1. Focus Group Research**

#### **4.1.1.1. The Population and the Sampling of Focus Group Research**

The population of the focus group research was specified as the representatives from different segments of the logistics industry, especially the segments that were more likely to buy industrial services from logistics centers. The focus of this study is limited with logistics service providers so other potential industrial customers of logistics centers like the retailers, hotels, banks, universities were not included in this population. In order to specify the boundaries, the activities that were aimed to be covered were identified first and the population was chosen accordingly. The logistics activities that were to be covered were four main transportation modes, warehousing, port services, freight forwarding and 3PLs. It was decided to include the shipper perspective as well as a complementary component in order to represent the second tier industrial customer of a logistics center.

The sampling method employed in this part of the research process was judgemental (purposive) sampling instead of random sampling. The region where the focus group study was held, had many different representatives of these sector

segments but employing a random sampling strategy could have resulted in large sampling errors due to the small sample size. Also in qualitative studies, the aim is to explore a complex subject deeply rather than generalizing a specific point to a large population. Random sampling is a sampling method that can be used on normally distributed large samples and in research that aims generalizing the research results (Marshall, 1996). Judgemental sampling, on the other hand, depends on the researcher's expertise in terms of sample choice. Within this expertise framework, the samples that have specific expertise or experience related with the subject are chosen purposively in order to reflect the population as exactly as possible (Cooper and Schindler, 1998).

So ten representatives from different segments of the logistics industry were chosen purposively by the researcher in order to conduct a focus group session that aimed to explore user expectations from a logistics center to be established in the research area. The research took place in Izmir, Turkey so all the participants were selected from this region. They were sent invitation mails to the focus group session which was held at a university facility. Although, all ten representatives confirmed to participate in the study, only six of them could attend to the session due to last minute changes on their schedules. The sample demographics are listed on Table 14.

**Table 14.** Sample Demographics in Focus Group Research

| <b>Participant<br/>s</b>                 | <b>1</b>                             | <b>2</b>                                                            | <b>3</b>                             | <b>4</b>                                  | <b>5</b>                                                                    | <b>6</b>                                 |
|------------------------------------------|--------------------------------------|---------------------------------------------------------------------|--------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------|
| <b>Age</b>                               | 29                                   | 45                                                                  | 34                                   | 35                                        | 35                                                                          | 55                                       |
| <b>Tenure at<br/>current<br/>company</b> | 2,5 years                            | 19 years                                                            | 3 years                              | 8 months                                  | 2 years                                                                     | 32 years                                 |
| <b>Tenure at<br/>the sector</b>          | 7 years                              | 23 years                                                            | 15 years                             | 14 years                                  | 15 years                                                                    | 32 years                                 |
| <b>Duty</b>                              | Foreign<br>Trade<br>Manager          | Fair<br>Transport<br>and<br>Logistics<br>Services<br>Managemen<br>t | Manager<br>(Bonded<br>Warehouse<br>) | Sales &<br>Marketing<br>Manager<br>(Port) | Foreign<br>Agency<br>Managemen<br>t Assistant<br>Manager<br>(Sea Trade)     | CargoTransport<br>Manager<br>(Railroads) |
| <b>Education</b>                         | Bachelor's                           | Bachelor's                                                          | Associate's                          | Bachelor's                                | Bachelor's                                                                  | Bachelor's                               |
| <b>Sector</b>                            | Dried<br>&Frozen<br>Food<br>Products | International<br>Land<br>Transport &<br>Logistics                   | Logistics                            | Port                                      | International<br>Sea<br>Transport &<br>Shipping<br>Agency<br>Managemen<br>t | Rail<br>Transportation                   |

The participants of the focus group represented six different perspectives to logistics centers. Railway, seaway and motor transportation were represented by three service providers. One of the private port initiatives participated in the session for the inclusion of their ideas in terms of port-logistics center integration. A warehouse manager shared his ideas regarding potential logistics center investments. The second tier perspective was represented by an exporter located in the research region.

#### **4.1.1.2. The Data Collection Process for Focus Group Research**

Focus group study has been a widely used research tool especially in the fields of business and marketing (Greenbaum, 1998), sociology (Morgan, 1996), nursing (Webb and Kevern, 2001) and overall health studies (Wilkinson, 2004). It is a way of collecting data from a specific group of respondents in an informal discussion setting and around a focused topic or a set of issues (Wilkinson, 2004). The main advantage attributed to focus groups is that they provide deeper and richer

data through participant interaction when compared with one-to-one interviews (Webb and Kevern, 2001). Group dynamics stimulate valuable information generation process through fruitful discussions in group members' own vocabulary and experiences (Kitzinger, 1995).

Focus groups are used to generate and collect data in exploratory research especially for previously unexamined topics. By bringing people who share similar backgrounds or interests together, focus groups create opportunity to produce new ideas or determine some dimensions in the subjects that the researchers wish to understand (Morgan, 2008). The similar condition of logistics centers for Turkish logistics industry was validated by one of the participants during the focus group session as: "I wish we had been consulted before. I wish we could have come together before and have discussed about these issues before. It would have been much more enlightening for all parties." So the topic was unexplored before and the session was useful in generation of practitioner ideas.

Greenbaum (1998) distinguishes three different types of focus groups which are full groups, mini groups and telephone groups. Full groups consist of 8 to 10 people whom gather and discuss a specific topic for 90 to 120 minutes. Mini groups are similar with full groups but they are composed of 4 to 6 people. In telephone groups the discussion is held through a tele-conference and may last for 30 to 120 minutes. In this study, a full group was intended in the beginning and 10 experts were invited to the session first. However, due to their schedule constraints only 6 of them could attend. So a mini group session could be realized which resulted in a positive outcome because in mini groups a participant can join the discussion for a longer time when compared with full groups (Greenbaum, 1998). The group discussion in this study was fruitful in terms of equal and in-depth participation by the members.

Using focus group analysis in logistics and supply chain research has its examples in the related literature especially for exploring practitioner perspectives. Christopher and Jüttner (2000) use focus group analysis in order to explore the strategic supply chain partnership practices in the industry and combines the method with specific case analysis. The method is also used for industrial/product design studies both for generating design inputs and exploring human factors in product use

(Brusenerg and McDonagh-Philp, 2002). Focus group study was specifically chosen to reflect the ideas and approaches of Turkish logistics industry experts towards logistics centers and it was the first step of a triangulated research process. As Maloni and Carter (2006) state in their study on 3PL research in logistics literature, practitioner involvement in the first stages of research process can be a valuable input for the further survey studies especially in terms of item generation and refinement. Practitioner involvement can be achieved by case studies and focus groups. The focus group session in this study intended to involve practitioners from different areas of the Turkish logistics industry and the inputs derived from this session are used to design the technical descriptors of logistics center services in the survey research.

Regarding the supplementary use of focus group studies with other research methods, the group data generated through focus groups may be used as preliminary information for a primarily quantitative research process like a survey study. On the other hand, the focus group session may also be complementarily used with other qualitative research methods as well like direct observation or one-to-one interviews (Morgan, 1996). This combination of qualitative methods contributes to the researcher's exploration effort of the phenomenon that is under question (Morgan, 1997). The focus group research in this study is combined with other qualitative studies and quantitative studies in order to answer the research questions with the intention of covering all available aspects. The results of the focus group session are supported with a content analysis study and one-to-one interviews throughout the qualitative research steps.

Throughout a focus group session, one moderator manages the discussions as a guide but tries to interfere as rare as possible. The duty of the moderator is to plan the session and to make sure that the discussion goes around the focused framework (Greenbaum, 1998). Moderator tries to avoid any manipulation during the session. He/she does not ask direct questions like a group interview session; rather the participants are handed a formal schedule and some general questions and they lead the discussions themselves through group interaction. The session is generally audiotaped for future decoding (Kitzinger, 1995).

For the focus group session in this study, two different question forms were prepared. One inquired personal profile information and was used for analyzing demographic data. The other form contained the focus group questions and the participants were allowed to read the question form first and take some notes both in the beginning of and also during the session process.

The focus group session took place in Alsancak-Izmir-Turkey at one of the seminar halls of Dokuz Eylül University Rectorate on 04 July, 2011. The participants were invited via e-mails to the Rectorate at 15:30, 04 July, 2011. Short meeting and introduction part lasted for 30 minutes. Focus group discussion started at 16:00 and ended at 17:30. The session was moderated by the researcher and there were two other observers who took written notes and observations regarding the group interaction. The session was also audiotaped for further transcription and these audiotape records were cross-checked with the written transcripts in order to make sure that all discussions are covered for the analysis. The session lasted for 90 minutes and all participants had the chance to contribute to the discussion more than once.

The questions were prepared from a general scope towards more specific questions (Krueger, 2002). Four questions were prepared in this sequence and all questions had the chance to be discussed by all participants. The list of the questions are as follows:

- In general, what are the services and characteristics of a logistics center that is to be established in or around Izmir?
- What are the potential advantages or benefits that you think your company could gain through engaging in a logistics center?
- What are the potential disadvantages of a logistics center that is to be established in your region for your company?
- What are the reasons that would derive your company to invest or take part in a logistics center?

The questions were prepared with the aim of exploring the industrial service characteristics required by the potential customers of a logistics center and their organizational buying motivators for the transaction that would take place between the industrial customers and the logistics center. As per focus group research design

rules, the moderator did not interfere with the discussions but just guided the group with the above listed questions framework. All the respondents have had the chance to express their ideas equally and freely. An ending question was asked in the form of “Have we missed anything?” (Krueger, 1998a) in order to make sure that all ideas are covered related with the topic.

#### **4.1.1.3. Analysis of Focus Group Data<sup>9</sup>**

Following Krueger and Casey’s (2000) methodology for focus group data analysis process, the transcripts of the session were analyzed manually through decoding and interpreting the participant quotes. The below given procedure was followed in order to decode and manage the transcript. The researcher segmented the whole transcript by the answers to four different questions and then each quote by each participant was analyzed by asking the following questions (Krueger and Casey, 2000: 134-135):

*1- did the participant answer the question that was asked? If yes, go to question 3; if no, go to question 2; if don’t know, set it aside and review it later;*

*2. does the comment answer a different question in the focus group? If yes, move it to the appropriate question; if no, go to question 3;*

*3. does the comment say something of importance about the topic? If yes, put it under the appropriate question; if no, set it aside;*

*4. is it something that has been said earlier? If yes, start grouping like quotes together; if no, start a separate pile.*

After the grouping process, all the relevant quotes have been clustered under the related question. The irrelevant ideas were left for further analysis. Also some notes that were taken by the moderator and the observers during the session like non-verbal expressions, jokes, irrelevant anecdotes or other group interaction instances (Krueger, 1998b) were analyzed at this stage as well.

For the interpretation of this structured data, the important thing is not to focus only on individual quotes but to derive analytical results throughout the relations between quotes and the examination of group interaction (Rabiee, 2004). Krueger (2002) suggests seven main criteria for the interpretation of focus group data

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<sup>9</sup>This focus group study was presented in the IX. International Logistics and Supply Chain Congress and the findings were published in the proceedings of this congress. The feedback derived from this presentation led the way for the forthcoming research steps.

which are words, context, internal consistency, frequency/extensiveness, intensity, specificity and big ideas. Words refer to the different words or phrases that are used by the participants and their actual meanings. Context refers to the environment that a specific contribution was expressed or the stimulus that derived a specific discussion. Analysis of this context may contribute a lot to the interpretation process. Internal consistency refers to the direction of the discussion. The discussion may shift to another direction and the analyst should clarify the time and the cause of this direction. Some quotes or ideas are expressed more often than others so they represent the frequency or extensiveness criterion. Intensity may be interpreted through the emotional expressions or discourse of feelings around specific subjects. Specificity is related with the details that are given about a certain issue or experience. Finally the big idea refers to a new suggestion, an overall trend or a large agreement on a specific idea that cuts across all discussions. The transcript coding and the interpretations were held throughout this framework and question by question.

First Question:

- *In general, what are the services and characteristics of a logistics center that is to be established in or around Izmir?*

The participants started to share their ideas about the distribution of sources and the management style of the logistics center here. According to the findings, different parties are all reluctant about this issue. They are afraid of competition conditions and the quality of service that will be created in such a center. The real shipper view shows that one stop shopping is a great advantage for them but the logistics concept has a wide range of facilities which are not among the expertise limits of single companies.

*1:I, as a customer, would like to reach all the services that I need from one stop in a logistics center. This would decrease my communication costs.*

*5:The problem is, one company is not able to handle all of the services that are needed by the logistics customer.*

*2: Let us think that the logistics center is established. I have doubts about the distribution of duties to separate entities.*

The required services mentioned by the participants can be listed as seaport-railway connection, telecommunication networks, communication infrastructure,

customs, social facilities (accommodation, dining, shower services), banking and finance sector and also repair centers, electronic and mechanic workshops. These repair centers were mentioned for both machinery and equipment repairs that are urgent and frequent in logistics facilities and also for trucks and other vehicles that often face with break-downs.

*6: The ownership of logistics centers belong to either one single company or public-private partnerships in Europe. (Gives some examples from Italy and France) We are in favor of these partnerships. Postal offices, customs, banks, restaurants, information technologies, optical databases, bonded warehouses, warehouses, repair areas must be available in logistics centers. Railways should be present and the necessary infrastructure like receipt and shipment docks that are able to accommodate rail cars, ramps that are able to facilitate forklift stuffing, container stocking yards, portal cranes and rail connections into the warehouses should be prevalent.*

*4: I think logistics centers should be close to ports and industrial zones. Rail and land transport can reach logistics centers but vessels can not!*

*2: Without a railway, there can not be a logistics center. Railways serve as a customs corridor and would facilitate bonded transshipment without a transit declaration or deposit so will save from time and money.*

These quotes state that railway connection is a must for the logistics center. As the railroads are operated by the state in Turkey, this requires the government partnership in such an investment for sure. Any project that will be undertaken within this context will require public cooperation.

*3: The main question is “Is Turkey ready for this?” or “Is Izmir ready for this?”. I think that Izmir is not ready. When we made a research about this subject last year, we were faced with many barriers from competitors, the state, and customs officers. The customs legislation should definitely be changed. The logistics center should not turn into a monopoly. Head of customs, working offices, warehouses, dangerous goods or cold storage facilities, truck parking yard, railroad should be prevalent.*

*6: Extensive planning is necessary.*

(Collective service in a single location emphasized by 6 but was opposed by 3 due to competition concerns.)

*5: The costs are important. The customers are not ready for these services but the investors would expect a decent return for their investment.*

(The legislation, the pace of state procedures, flexibility, adaptability concerns, fast state service were emphasized and a new idea of “Coordinator Minister” whom would be able to speed up and eliminate all the bottlenecks in the services of logistics centers was generated.)

The longest discussion lasted upon the first question. The results show that there are many different services required from logistics centers but by checking the repetition numbers and emphasis, the most important aspects are railway connection and state mentality together with the legislation. The good examples from Europe were quoted by the participants but the adaptability of such an organization to Turkey seems to require changes in Turkish logistics business.

Second and third questions

- *What are the potential advantages or benefits that you think your company could gain through engaging in a logistics center?*
- *What are the potential disadvantages of a logistics center that is to be established in your region for your company?*

At this part, the discussions related with the advantages and the disadvantages of investing in a logistics center are combined as the discussion was held in such a way. Although the advantages were much more referred to, the intensity of the potential disadvantages were high. The reluctance of the participants emerged here as well in terms of customs legislation, monopolistic management approaches and also competitive concerns.

The advantages mentioned were the decreasing production costs due to the combined transport opportunities and shortened distances (depending on the location of the logistics center). The port’s view is that the logistics center will serve as an empty container stocking yard for them where this service is highly inefficient in the port area. Other advantages mentioned were the unity of all service providers, increased service quality due to increased competition and expertise, employee and employer matching in a specialized area. Another mentioned advantage was the positive effect on the environment as the current facilities in the city are creating a great mass of pollution and the rail connection is an environmentally friendly way of transportation.

6: *The advantages for us are the ability to deliver cargo to a single point instead of distributing to dispersed locations. This means lower number of personnel, higher speed and efficiency. Besides we will be at the center of the cargo. Marketing research won't be necessary anymore. Empty rail car transports will be eliminated which is a total loss for us.*

5: *The decreased costs for inland transport before loading on to vessels are an advantage.*

Here the paradox was about the extra costs that will incur due to the incremental services provided as the costs are mentioned both in the advantages and disadvantages part. However, the shipper view states that the customers would bear the cost of an improved service. Logistics costs already form a large portion of the overall manufacturing cost, but elimination of errors and creation of a better working process through a professional center would generate additional competitive advantage for these users. The service providers are cautious about this cost issue because they do not fully believe that this additional price margin won't cause a loss in the market share for them. These concerns should be eliminated.

1: *Logistics costs constitute a great portion when the whole production is taken into consideration. So I think that if the service quality will increase at the end, the customers will bear the cost. Also railways would contribute to the environment as the current situation in the middle of the city causes serious environmental pollution.*

Moderator: *What are the disadvantages?*

5: *The inflexibility of state is a disadvantage, private sector must be there. High costs and competition may be disadvantageous.*

2: *The returns of existing investments have not been earned yet. So the establishment of such a center would decrease the value of these existing investments in different locations. Besides, there is an alive economy in Alsancak. Carrying all logistics activity to a center located in a different place would incur social and economic problems for Alsancak economy.*

According to the discussions upon question 2, the unity of all service providers, lowered transport, stocking and handling costs are among advantages. However, some participants are hesitant about the costs in terms of extra competition, the value of existing facilities and the situation of current economy.

Fourth Question

- *What are the reasons that would derive your company to invest or take part in a logistics center?*

The overall discussion was partly over when this last question was asked. The discussion around the fourth question was similar with a closing summary. Each participant repeated the advantages they see in a logistics center and clustering in such an area and the services or infrastructure properties that they want to see in such an organization. So only the new ideas or new discussions are transcribed and interpreted in this section.

*2: Some companies want to be among the first-movers. This is a strong motivation for us. Investment cost and finance management are important.*

*4: The location is important for us. If it is not close to our port, we won't invest in such a facility. Besides we always talk in terms of containers but bulk cargo facilities are important. Special handling equipment and silos for bulk cargo would attract our attention towards logistics centers.*

A final question was asked to the participants in order to make sure that all aspects were covered well throughout the session. The participants responded by expressing their wish that such studies were held before and they stated that coming together with representatives from different sides of the logistics sector contributes a lot to common understanding and solution of sectoral problems. They informed that the focus group session was very beneficial for themselves as well.

The homogeneity of the participants was achieved by choosing all of them from the logistics industry however, they also had their differences in terms of specific expertise. One important aspect of this focus group session was that it involved a participant from the state as well (National Railways of Turkey). Private sector perceptions regarding state institutions are generally not very optimistic in terms of new investments and state regulation in such development activities. This focus group study was also a chance to observe different opinions and to provide a platform for public and private authorities for discussion.

The quotes and the transcript coding were analyzed and converted into certain dimensions of industrial service or infrastructure characteristics that are required to be in a logistics center (Table 15). While analyzing these texts Krueger's (2002) seven-item framework was used in order to systematize the action.

**Table 15.** The Summary of the Focus Group Session Findings

| <b>Participants</b>                          | <b>1</b>                                                      | <b>2</b>                                                                                                                                                                                                                            | <b>3</b>                                                                                                                               | <b>4</b>                                                                                                     | <b>5</b>                                            | <b>6</b>                                                                                                                                                                                                                 |
|----------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Services and Buying Criteria</b> | One-stop shopping                                             | Duty distribution<br>Seaport-railway connection<br>Telecommunication network<br>Communication<br>Customs<br>Social facilities<br>Repair center<br>Customs corridor<br>First-mover advantage<br>Investment cost<br>Financing options | Mentality<br>Head of customs<br>Legislation<br>Working offices<br>Warehouses (special cargo storage)<br>Truck parking yard<br>Railroad | Banking and finance services<br>Proximity to ports and industrial zones<br>Location<br>Bulk cargo facilities | The costs<br>The management                         | Ownership<br>Postal offices<br>Customs<br>Banks<br>Restaurants<br>Information technology<br>Optical database<br>Bonded warehouse<br>Normal warehouse<br>Railroad infrastructure<br>Container yards<br>Extensive planning |
| <b>Advantages</b>                            | Service quality<br>Environmental protection (due to railways) | High-skilled labor match                                                                                                                                                                                                            |                                                                                                                                        | Lower costs<br>Collection of hinterland cargo<br>Empty container stocking yards                              | Decreased total cost for door to door transport     | Single point delivery<br>Efficiency<br>Speed<br>Elimination of empty rail car movement                                                                                                                                   |
| <b>Disadvantages</b>                         |                                                               | Decreasing value of existing facilities<br>The negative social and economical effects on current activity in Alsancak                                                                                                               |                                                                                                                                        |                                                                                                              | Inflexible state operations<br>Competition<br>Costs |                                                                                                                                                                                                                          |
| <b>Big Idea(s)</b>                           |                                                               | Coordinating Minister from the state                                                                                                                                                                                                |                                                                                                                                        |                                                                                                              |                                                     |                                                                                                                                                                                                                          |

According to the summarized results listed in Table 15, the industrial services that are required from logistics centers vary according to the expectations of different parties. In the mean time, these different parties agree that some of the services are musts and they create the notion of logistics centers. These musts can be listed as the seaport-railway connection, one-stop shopping characteristics, customs corridors (free zone characteristics were emphasized during the session) and the change in the customs legislation.

When the transcripts were analyzed, it was easily seen that a logistics center was mainly defined and characterized by the European best examples. However, adapting this concept to Turkey will require a great deal of customization due to the business structure and the prevailing industrial realities. Even regions differ in terms of customer requirements, customer structures, service demands and the cost bearing thresholds. These all should be taken into consideration before investing in such a facility. Establishing the physical infrastructure with taking the industrial buying criteria mentioned in Table 15 won't be enough to maintain an efficient, developing and promising logistics center. Convincing the possible participants about the management style, the costs, and the elimination of governmental procedures will have a greater impact in encouraging them to invest in these centers.

The study also indicated that there will be some conflicting interests in an organization that contains so many different entities within its boundaries. For example, the participant coming from the port stated that they would not invest in such a facility if it weren't close to the port. What they need is a back support for their port operations in a logistics center. This requirement may contradict with other participants' requirements as they all are highly sensitive about the investment costs and the transportation costs to/from the logistics center. Location will affect these costs directly.

The outputs show that besides the services needed, there are some other broader functionalities that are required from logistics centers. These should be examined in greater depth in future studies. More exploratory and empirical efforts are needed in order to determine country and region specific demands from a future logistics center. That's why this focus group study was supported with further qualitative analysis before moving on to the quantitative analysis stages. A content

analysis study and some one-to-one interviews were held in order to validate and supplement the findings of the focus group study.

#### **4.1.2.Content Analysis**

##### **4.1.2.1.The Population and Sampling of Content Analysis Research**

The first qualitative research step aimed to receive feedback from the practitioners in the logistics industry and thus focus group research was chosen for this step. At the second step of the qualitative research process, the objectives were to enlarge the sample, validate the initial results with other reliable resources and to include an organizational buying perspective into the customer expectations or technical characteristics of a logistics center. Derived by these objectives, this time, the publications in the logistics field were decided to be analyzed at this research step. However, the aim was not conducting a traditional literature review. Rather, it was to validate the initial results with a larger sample so the population for this research was all of the journals that were either totally focused on logistics industry or were partly related with it. Then in order to limit the population within a manageable size, the most active and influential logistics associations were chosen whose periodicals were published at least quarterly. Following the rules of judgemental sampling methods, the associations or institutions were selected in order to formulate a representative sample of the Turkish logistics industry. The selected periodicals were published by:

1- International Transporters' Association - Uluslararası Nakliyeciler Derneği (UND) – UND'nin Sesi Dergisi

2- Association of International Forwarding and Logistics Service Providers - Uluslararası Taşımacılık ve Lojistik Hizmet Üretenleri Derneği (UTIKAD) – UTA Lojistik Dergisi

3- Logistics Association - Lojistik Derneği (LODER) – Lojistik Dergisi

4- Chamber of Shipping - Deniz Ticaret Odası – Deniz Ticareti Dergisi

5- Mersin Chamber of Shipping – Mersin Deniz Ticareti Dergisi

The reason that this content analysis was not conducted among peer-reviewed academic journals is the scarcity of the literature that combines organizational buying

and logistics centers. Even logistics center alone is a rather new subject for academic research. One other reason to choose the above mentioned periodicals is their active representation of the practitioners in the Turkish logistics industry. Majority of the articles in these periodicals summarize the opinions and approaches of logistics managers and decision makers in terms of current topics. These associations all try to take part in the policy formation and decision making processes for the establishment and operation of logistics centers in Turkey. Also, it can be said that the sample is a rich sample in terms of its representation power of different logistics activities like warehousing, port management, shipping, road transportation, rail transportation and air transportation. Therefore it can be proposed that this sample is an extension of the limited sample that joined the research during the focus group step. Additionally, being the strongest representatives of the Turkish logistics industry, these associations' periodicals can be considered as reliable resources that will validate the focus group results.

One other objective of this qualitative research step was to integrate customers' expectations from logistics centers with organizational buying process. The most frequently cited two organizational buying process models belong to Sheth (1973) and Webster and Wind (1972b). While Webster and Wind model has a hierarchical approach that starts with the impacts of macro environmental factors and ends with the impacts of individuals' perceptions, roles, motivations on organizational buying decisions, Sheth model is a relatively specific model which tries to distinguish different components of the organizational buying process. Sheth's organizational buying model which is represented by Figure 8 has four main components which are the expectations of the buying center, organizational buying process, conflict arising due to joint decision making activities and the situational factors that influence the supplier or brand choice. This model, takes the buying center members' psychological characteristics into consideration and makes an attempt to cover all available variables. In addition, the model examines the buying center in depth and combines it with the other components of organizational buying process like product-specific factors, company-specific factors or conflict. Sheth's model was selected to be used in this stage of the research as Webster and Wind's model was employed for further analysis in the survey research stage.

#### **4.1.2.2. The Data Collection Process for Content Analysis Research<sup>10</sup>**

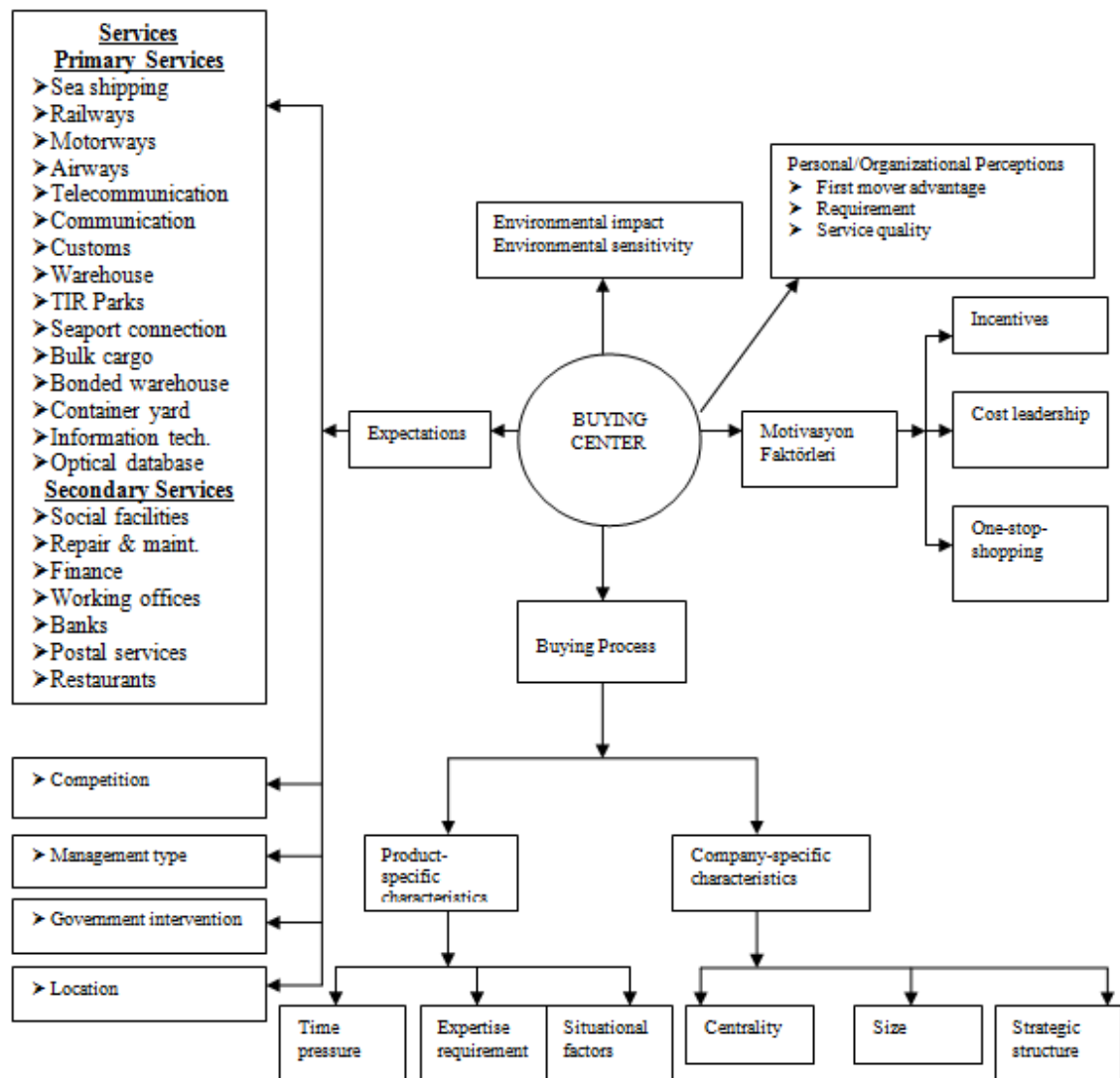
The data collection process in a content analysis research is bound to the categories and themes that are chosen for further examination. The technique aims to deduce the large amount of words in the selected texts to a limited number of categories (Weber, 1990). It is defined as an analysis that the researcher(s) develops categories covering all dimensions of the topic and detects the observation frequency of these categories within the selected text (Bailey, 1994). This method is generally used for exploring new trends and the changes in current trends by marketing and communication sciences (Cooper and Schindler, 1998). In this research, content analysis was used in order to specify the industrial services that are expected from a logistics center and to conceptualize these expectations together with other organizational buying determinants, by exploring the main categories and sub-codings within the selected periodicals.

For the formation of the research model, the outputs of the focus group research were used. The answers given by the focus group session participants to the four main questions were gathered as sub-codings. Two additional codes for air transportation and road transportation were added to the list. These outputs were integrated with Sheth's organizational buying model and the research model was formulized as per Figure 24.

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<sup>10</sup>This content analysis study was presented in the 16<sup>th</sup> National Marketing Congress and the findings were published in the proceedings of this congress. The feedback derived from this presentation led the way for the forthcoming research steps. Later, a revised version of the full text was published by Journal of Marketing and Marketing Research in Turkey.

**Figure 24.** The Research Model of Content Analysis



The focal point of the research model was formulized to be the buying center. Buying center is the first dimension of Sheth’s model. Here in this research it is the focal point. The buying center of the organizational buying process which is explored in this study is represented by the top managers, purchasing departments and functional managers like marketing, finance or information technology managers in 3PLs or 4PLs.

The information resources were eliminated from the initial Sheth model because it was out of the scope of this research. Instead, the emphasis was on the customer expectations regarding the industrial services and other main characteristics

of a logistics center. So the left handside of the model represents the responses of the focus group participants to the question that explored their expectations. These are grouped under primary and secondary services, management of competition, management style, state approach and the location of the logistics center.

The background of buying center members were represented with the individual perceptions dimension that they mentioned during the focus group session like the first mover advantage, the requirement for adaptation and the higher service quality. An additional dimension of physical environment was added to the model as it was frequently cited by the focus group members and is a commonly referred motivation under logistics clusters.

Motivation factors belong to the background of the individuals in the buying center and they are represented with possible state incentives that could be introduced for these specialized zones and consequently reduced operational costs. One additional motivator was mentioned as one-stop-shopping emphasis as a logistics center would be a region where a customer is able to find all required industrial services at one point.

Two sub-dimensions affecting the organizational buying process were product-specific characteristics and company-specific characteristics. These are exactly the same with original Sheth model, but their sub dimensions were revised for this research model. Product is the industrial service provided by logistics centers here. This service may have specific time-pressure due to the high responsiveness requirements of global supply chains. It already requires certain expertise as logistics centers are new phenomena for the Turkish market and they should be designed and run by industrial professionals who have expert knowledge on logistics field. In addition to these there are some situational factors like the competition, geo-political developments, innovation. The company-specific characteristics are organizational size, centralization (organizational structure) and the strategic focus.

In order to collect the data, first the time frame of the content analysis was determined. Due to the recency of the logistics center concept, the time framework was specified to be 5 years back from the research date which is July, 2006 - July, 2011. However, because the online versions of the periodicals were not available and the periodicals were distributed within sectoral membership principles, it was not

possible to reach all of the volumes published during these five years. At first the available hard copy volumes were organized; the missing volumes were detected and the related associations were contacted for reaching them. This process was carried on between 15 June-15 July 2011 at the library of the Maritime Faculty of Dokuz Eylül University. Maritime Faculty is a regular member of these periodicals and available copies of the periodicals were archived in the library records. At the end of this process, a total of 142 periodicals were collected.

The data collection process of the content analysis research was completed in two consecutive stages. At the first stage, the main themes were formed as logistics centers and freight villages as these two terms are used synonymously and widely. These two terms were searched in 142 journals and the texts that contain these keywords were recorded by the researcher to a table by their journal name, volume, date and page numbers. This process was carried on between 25 July-25 August, 2011 in Izmir-Turkey. The main themes were found in the texts composed of 131.774 words in a total of 73 journals. This result showed that 51% of the total sample contained the main themes in their texts.

At the second stage of the analysis, the sub-coding list was searched within this reduced sample. It was examined if the keywords on the research model were referred in the texts that were mentioning logistics centers somehow. This process took place between 25 August-25 September, 2011 in Izmir-Turkey. The keywords on the sub-coding list were observed 2526 times within the sample texts. Their distribution among the research model dimensions are given on Table 16 and Table 17.

**Table 16.** Results of Content Analysis I

| <b>EXPECTATIONS</b>            |      |                                  |     |
|--------------------------------|------|----------------------------------|-----|
| <b><u>Primary Services</u></b> | n    | <b><u>Secondary Services</u></b> | n   |
| Railroads                      | 1056 | Financing                        | 34  |
| Sea shipping                   | 227  | Banks                            | 27  |
| Customs                        | 177  | Maintenance & Repair             | 11  |
| Warehouse                      | 165  | Postal services                  | 7   |
| Bulk cargo                     | 41   | Working offices                  | 7   |
| Bonded warehouse               | 40   | Restaurants                      | 6   |
| Port connection                | 40   | Social activities                | 4   |
| Communication                  | 24   |                                  | n   |
| TIR Parks                      | 22   | <b><u>Competition</u></b>        | 178 |
| Container Yard                 | 17   |                                  | n   |
| Information Technology         | 12   | <b><u>State Approach</u></b>     | 129 |
| Telecommunication              | 3    |                                  | n   |
| Optical database               | 0    | <b><u>Management Style</u></b>   | 54  |
|                                |      |                                  | n   |
|                                |      | <b><u>Location</u></b>           | 55  |

**Table 17.** Results of Content Analysis II

| <b>BUYING PROCESS</b>                          |    |                                                |    |
|------------------------------------------------|----|------------------------------------------------|----|
| <b><u>Product-specific Characteristics</u></b> | n  | <b><u>Company-specific Characteristics</u></b> | n  |
| Situational factors                            | 78 | Size                                           | 17 |
| Expertise requirement                          | 6  | Centralization                                 | 9  |
| Time pressure                                  | 4  | Strategic focus                                | 0  |

| <b><u>Personal Perceptions</u></b> | n  | <b><u>Environment</u></b>        | 42  |
|------------------------------------|----|----------------------------------|-----|
| Service quality                    | 29 |                                  |     |
| First mover advantage              | 13 | <b><u>Motivation Factors</u></b> | n   |
| Requirement for adaptation         | 6  | Cost advantage                   | 177 |
|                                    |    | Incentives                       | 64  |
|                                    |    | One-stop-shopping                | 3   |

#### 4.1.2.3. Analysis of Content Analysis Data

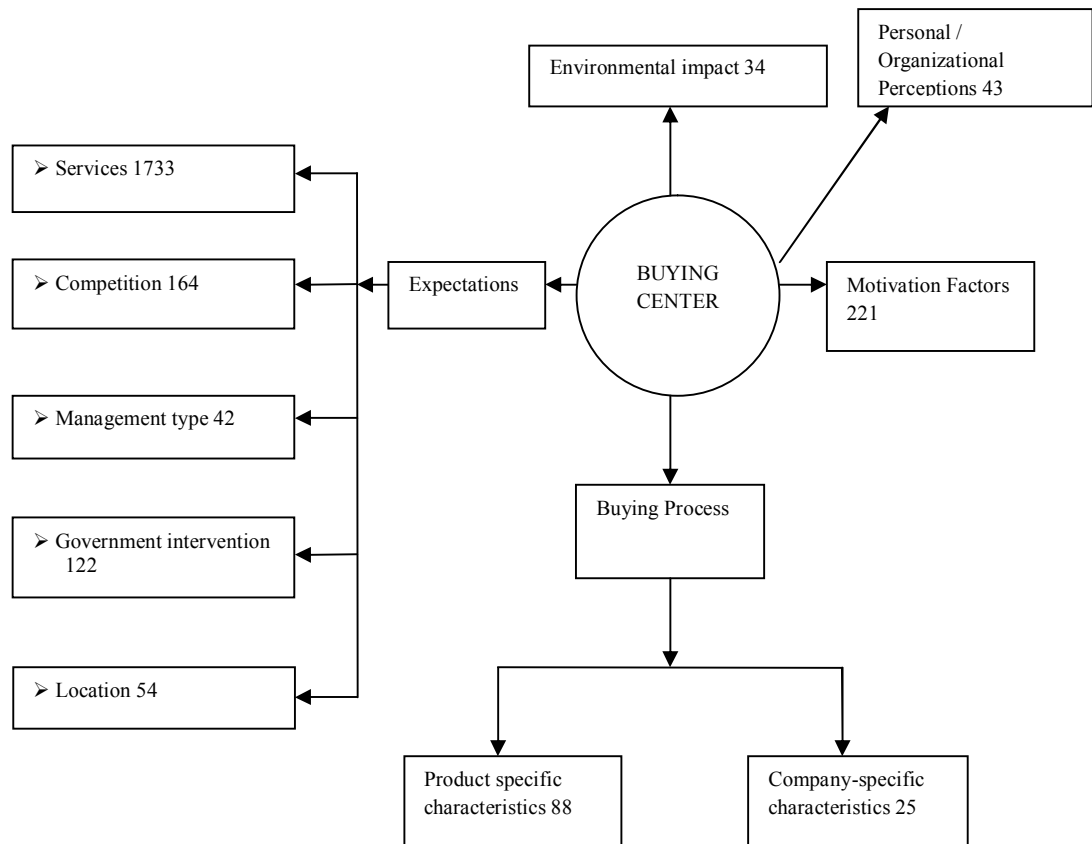
In order to analyze these frequencies and integrate them with Sheth's organizational buying model, the results were reflected on the initial research framework with Figure 25. This figure summarizes the most frequently cited

keywords by the associations' publications representing the Turkish logistics industry. As shown on the figure, the most frequently repeated terms belong to the industrial customers' expectations from logistics centers. This is a natural outcome as a logistics center was not operating in Turkey when the research was held and all the discussions were made on the design of the services and the technical characteristics required in a logistics center.

On the other hand, concepts like competition or state approach which are essential topics for Turkish business environment were also among the frequently observed terms. This is due to the high government influence on logistics business especially due to customs regulations and state-owned railways. The perceptions that tend to think the service quality would increase if the logistics organizations were clustered within a logistics center and there will be first-mover advantages for the first inhabitants of a future logistics center were reflected on the model with their own weights.

It was observed that the most powerful motivation factor for organizations to take part in such a facility is the possible cost advantage which could be derived from there. The majority of the weight in product-specific characteristics is gathered under situational factors. These are generally the unexpected and unpredictable conditions which belong to various topics. Nevertheless, company-specific factors like strategic focus, centrality, organizational size were not considered much within the sample texts. These show that the logistics centers were evaluated mainly with the industrial services to be given and the cost advantages to be provided. The organizational structures of the companies that will take place in such facilities were not among the debated topics during the time of this research.

**Figure 25.** Content Analysis Findings on the Research Model



When the tables 16 and 17 and figure 25 were analyzed, it was seen that the most referred concept was railways and rail transportation. The majority of the texts that contained the initial research themes of logistics centers and freight villages were seen in special issues on railways. Therefore, it was concluded that the biggest expectation regarding logistics centers was developed about the railways. This situation is a proof for the limited perceptions towards the logistics center concept by the Turkish logistics industry. The overall concept is deduced to railway transportation. Additionally, this result can be explained with the existence of a very powerful road transportation lobby in Turkey and the state-owned and state-operated railway transportation system. Privatization projects are referred frequently for Turkish National Railways, but until the end of this research they were still not finalized yet.

After the railways, the terms that were observed over a hundred times were sea shipping, competition, customs, cost advantage, warehouse and state approach. This terminology cluster is inline with the existing conceptualization efforts in the literature and the outcomes of the focus group research. Logistics centers should be designed as the nodes of the global distribution networks and therefore the warehousing services that are to be delivered at these centers may have a strong affect on the attractiveness of the facility. The reason for the emphasis on sea shipping is the Turkish exports' high dependence on sea transportation. The port-logistics center connections should be evaluated very well in the location selection and positioning activities of such facilities. Customs and state approach terms represent the hesitations regarding the public authority's governance methods in logistics centers. Generally, all the texts that cited these terms were explaining the private sector's negative perceptions regarding the customs and state intervention. Slow and strict customs procedures result in delayed deliveries within distribution channels and the representatives of the Turkish logistics sector state that this problem should be solved for logistics centers if they want to provide effective services. Also state intervention should be minimum in the management of these centers according to the analyzed texts so as to maintain dynamic structure of the private sector.

According to the widely accepted definition of logistics centers which is provided by Europlatforms, logistics centers would consist of many different enterprises operating together and should be managed by a single body. The organizations that would take place in such a structure should align their own organizational structures accordingly and should give importance to strategic partnerships or inter-organizational relationships. However, according to the social network analysis that was applied by Türker (2010) on the logistics organizations in Turkey, these enterprises do not give the necessary importance to strategic management and do not evaluate their relations with multiple organizations with a long-term focus. For the logistics center services to be sellable and economically sustainable, it is essential to consider the participant organizations' structural characteristics and to see the organizational buying process from this perspective.

### **4.1.3.Interview**

#### **4.1.3.1.The Population and Sampling of the Interview**

The interviewing process was the third qualitative research step in this study. Two different sets of interviews were carried out under different objectives. The first set was an effort to make sure that the content analysis results covered all of the existing opinions related with logistics centers and organizational buying process from these centers. So the population of the first interview set was the five institutions whose periodicals were analyzed: International Transporters' Association, Association of International Forwarding and Logistics Service Providers, Logistics Association, Chamber of Shipping and Mersin Chamber of Shipping. The researcher tried to reach to the whole population and all five of the institutions were contacted and reached for the interview.

The second set of interviews were held with the managers of successful logistics centers in the world. The population was composed of all logistics centers operating in the world. However, due to cost, time and geographical constraints it was not possible to reach the whole population. Only two interviews were able to be held at this stage with two managers from European logistics centers. The objective of this stage was to explore the operations of successful logistics centers, the services provided by these facilities, their infrastructure and management styles.

#### **4.1.3.2.The Data Collection Process for Interviews**

According to Brinkmann (2008) there are various methods for conducting interviews. They can be conducted face-to-face in surveys, through the telephone, over the internet. These are formal ways for interviewing. Informal interviews can be held as part of ethnographic field studies. In addition to these, interviews are separated into two main types which are structured and unstructured interviews (Kumar, 2008). An additional type is the semi-structured interview which is in between these two versions (Ayres, 2008). In a structured interview, the researcher prepares a systematic and rigid interview design, asks the questions in a sequential

manner and collects the data under a standardized methodology. In an unstructured interview, oppositely, the researcher has the freedom to ask a variety of questions that arise during the interviewing session and the respondent has the freedom to enlarge the subject to the other related fields if it is necessary (Kothari, 2004). The semi-structured interview is in between these two types where the researcher prepares some open-ended questions that initiate the session but the research process can be extended with other questions as well (Ayres, 2008).

A semi-structured interview method was chosen for the first interview set. Only two questions were prepared:

- 1- What are the factors that would impact the logistics service providers' organizational buying processes of property or services from logistics centers?
- 2- How can this process be developed in a better way?

In order to reach the institutions, they were called by the researcher and a representative's contact details working on logistics centers were collected. Those representatives were reached through telephones. Because four of them were located in different cities, the data collection process was done through the internet between 09-20 September, 2011. Only the respondent from Chamber of Shipping Izmir branch was interviewed face-to-face on 14 September 2011 at Yaşar University, Izmir. The face-to-face interview lasted for one hour.

The second interview set had nine questions and the interviews were held in a structured manner. The respondents received a written request for joining the interview. This request included the details like the content, duration and the date of the planned interview. The first interview of this second stage took place in Istanbul-Turkey during the International Logistics Forum '12 organized by Yeditepe University. The respondent was the representative of Verona Logistics Center and was in Istanbul for a presentation during the Forum. The interview took place in the conference hall after his presentation on 29 April 2012 and it lasted for 60 minutes.

The second interview of this stage was held in Bremen-Germany on 28 June 2012, at the offices of DGG - Deutsche GVZ-Gesellschaft mbH. It started at 09:00 and lasted for 120 minutes. A technical visit to GVZ Bremen Freight Village was

organized in addition to the interview. The technical visit supported the interview questions and the practical implications were able to be observed.

Although this second set of interviews had only two respondents, the information collected from them was very important in terms of supporting the collected data from Turkish logistics practitioners and civil society. This data represented the technical, infrastructural or managerial characteristics of the successful logistics center examples. The questions asked were:

- 1- Could you please define logistics centers?
- 2- What are the types of the companies that are located inside the logistics center?
- 3- What are the average land prices for purchasing or leasing?
- 4- Do you have any performance criteria for measuring the performance of the logistics center? If yes, what are they?
- 5- What is the management type in the logistics center? How is the ownership structure in the logistics center?
- 6- Have the services provided by the logistics centers were classified? Are the services criteria determined centrally or are they determined individually by every company?
- 7- Are the logistics center customers (internal and external) defined? Do you measure customer satisfaction? Are there any service quality targets?
- 8- Have you faced with any conflict within the center? How do you manage conflict?
- 9- What are the environmental advantages secured by the logistics center? Do you measure these advantages?

Both of the data collection sessions were tape-recorded and were transcribed afterwards. The responses were analyzed in terms of the similarities and differences. They were compared with the results of other qualitative research steps. These results were used together with the literature review outputs when developing the survey questions as well.

#### **4.1.3.3.The Analysis of Interview Results**

##### ***First Interview Set***

The first set of interviews with the representatives of five logistics institutions were analyzed in order to compare with content analysis results and they were found out to be inline with them. The commonly cited factors that represent the logistics service providers' expectations from logistics centers were cost advantage, economies of scale, proximity to international and national transportation corridors and positive environmental impacts. According to the respondents, speed in logistics services and consequently responsiveness of supply chains can be maintained through logistics centers as they will be established in areas which are out of urban traffic. Also, the coordination possibilities inside the center with governmental institutions like the customs, Ministry of Transportation or civil society institutions would facilitate effectiveness in required documentation and therefore reduce service time as well.

One other factor was mentioned as the supplier clusters located in logistics centers like maintenance and repair service providers, spare part suppliers or vehicle vendors. Locating at the same area with them results inexpectations regarding cost and speed advantages. Clustering together at the same area is also perceived useful by logistics service providers especially in terms of synergy leverages. Sharing the same infrastructure and resources which would have been impossible to afford if they operated individually results in cost advantages. Also common research and development activities are expected to generate some innovation advantages.

Turkish logistics service providers are generally providing standard industrial services like transportation of a single mode or simple warehousing. However, with the shared facilities and common expertise in the logistics centers, they may enhance their service level and differentiate their market offerings through value added logistics services or serving by different transportation modes. The themes derived from the results of the first set of interviews are compared with content analysis results as shown on Table 18.

**Table 18.** Comparison of Interview and Content Analysis Results

| <b>Interview Results</b> | <b>Content Analysis Results</b> |
|--------------------------|---------------------------------|
| Economies of scale       | Cost advantage                  |
| Speed                    | Time pressure                   |
| Security                 |                                 |
| Integration              | One-stop-shopping               |
| Rail transportation      | Rail transportation             |
| Logistics clustering     | One-stop-shopping               |
| Competition              | Competition                     |

These interviews were held to validate the content analysis results by comparing the institutional representatives' opinions with those institutions' periodicals. Also it was an attempt to explore if there were uncovered dimensions regarding the logistics services providers' expectations from logistics centers. Although majority of the results were inline with content analysis dimensions, security dimension was discovered as an extra component. As a result, this set of interviews reached their aim and the extra dimension was used in the survey item generation process.

One additional feedback derived from the first set of interviews was a general view regarding the governance of the Turkish logistics industry and the requirement for a Logistics Master Plan. The associations agreed upon the necessity of such a plan for the better design and development of logistics facilities like logistics centers. A holistic approach towards the overall logistics industry was suggested by the participants for a healthier infrastructure and industrial service development.

### ***Second Interview Set 1: Freight Village 1***

The findings of the second interview set exhibited the similarities and the differences between Italian and German applications of logistics centers. The responses to certain questions indicated that the aims and the operations of the logistics centers are different not only between European countries but also within single countries.

According to the interview records with Verona Freight Village (FV1), the industrial and commercial activity is not inside this facility. However there are

examples that such companies are also located inside the logistics center area like the Napoli Freight Village. The companies inside FV1 are mainly concentrated on the production of industrial services like packaging, reverse logistics, distribution and other value-added logistics services. Volkswagen's only distribution center for Italy and the Mediterranean region is located inside FV1.

FV1 adopts the definition of Europlatforms for freight villages (EEIG, 2004: 3). They do not apply any segmentation strategies to the companies inside the center and they promote differentiation as much as possible. They do not provide any 3PL services and they do not compete with any of the companies located inside. They only offer warehouse rental services, manage the railway terminal inside and provide common services like CIT, maintenance and repair and such.

The approximate land prices inside the center was asked inline with the cost advantage and incentive dimensions derived from focus group session and content analysis. The center area is divided into two parts called South and North. The land rates are around 2-3 Euros / sqm / month for South and around 4-5 Euros / sqm / month for North. These are rental rates and they are more advantageous when compared with land prices outside the center.

FV1 is run by a public body acting like a private company. There is a board of directors composed of 3 members from the province, 3 members from the municipality and 3 members from the Chamber of Commerce. This board assigns a director for the management of the center, this director becomes a member of the board and is responsible directly to the board.

The classification of the services inside a logistics center is done by an Italian Law n.240/90 as already mentioned by Cassone and Gattuso (2010). The service criteria and dimensions are set by the market and competition forces. The management does not interfere with these criteria and the competition inside. Even the railway terminal has 4 different operators, one of them public and there is competition between these operators too. If there is a problem with a service offering due to infrastructural problems, new investments are undertaken by the management, because inefficiencies rising from such problems are decreasing the performance of the freight village as a whole. As indicators of service quality, the center has ISO 9001, ISO 14001 and OHSAS certification.

Conflict management inside the center was an important issue and therefore included in the interview questions. According to FV1, the important point is to keep an equal distance to all participants of the freight village. This is assured by applying the same pricing policy to all companies. In FV1 the rents does not change depending on the size of the warehouse or the size of the firm. The unit prices are always the same. This pricing policy is due to the public objective of the overall freight village project which is the development of the industrialized areas instead of profit maximization. However, the financial strength of the freight village company is very important to secure this balance because none of the inhabitants would like to pay for the establishment of rail terminals or customs infrastructure. These are public investments and their investment costs should not be reflected to potential members of the freight village. In order to support freight villages, the Italian government was giving incentives in the past to first developers of such facilities. Today, the freight village companies try to maintain their financial strength themselves.

One last question was related with the environmental impact or advantages gained by the agglomeration of logistics activity. FV1 has carried on a project in order to calculate this advantage. They used EU criteria like tonnage of cargo on road and rail, number of railcars or average miles traveled on road in order to build up the formulas. The results showed that together with the direct and indirect costs, freight villages save 90 billion Euros per year. They reduce pollution and traffic accidents, delay the deterioration of highways, eliminate road congestion and ease the travel through Alps. In FV1, only electrical motors are used for internal handling.

### ***Second Interview Set 1: Freight Village 2***

FV2, on the other hand, represented the German experience with freight villages and they confirm that there are differences among existing facilities within Europe. The German freight village initiatives have a high percentage of public interest and macro objectives towards the establishment of such facilities. Their main aims are shifting freight from road to rail, optimizing the total transportation system, regulating city logistics and application of green logistics principles to general logistics industry. In contrast with UK where the freight villages are totally private initiatives and both the participants and the freight village organization are private

companies, in Germany the structure is a PPP. In the South European examples like Italy, France or Spain, the land is generally owned by the freight village development company and they rent the facilities. However, in Germany the LSPs or other members of freight villages want to invest themselves in the facilities, so they buy the land or the buildings instead of renting. This land belongs to the state and has some incentives in terms of prices. The average land prices in whole Germany are around 45-50 Euros / sqm, but in this kind of special industrial areas the state decreases the land prices to approximately 30 Euros / sqm.

The management structure is in the form of a network organization and there are 23 freight villages connected to the German Freight Villages Network. All of these member facilities have their own managers but there is a higher Advisory Board where all of them are represented. This Advisory Board is a macro governance structure that supports the members with fund raising activities, lobbying or strategy setting. The daily operations in 23 members are governed autonomously.

FV2 segments three groups of inhabitants in a freight village. These are (1) transport oriented operators, (2) LSPs and (3) logistics trade and production companies. When the first villages were established, LSPs were invited and they were tried to be attracted to the facilities. However, soon it was understood that their customers should be inside too and distributors, retailers, producers were selected as the second target group which is called logistics trade and production companies. Therefore, different from FV1 there is also production activity within FV2.

When defining logistics centers and differentiating between different terminology, FV2 representative emphasizes the necessity of multiple transportation systems inside the facilities. He states that unimodal facilities can only be logistics parks, a freight village has to have at least two transportation modes inside. FV2 has port facilities inside as well and is connected to inland river ports besides the rail-road interface. When defining dry ports, he said that they are facilities run by port authorities and they generally serve to a single port but freight villages can work with more than one seaports.

The German model of freight villages has a different management unit in all of the member freight villages which is called Freight Village Development Company (FVDC). This company is responsible for organizing cooperation between

members, consulting on specific projects, creating synergy, location marketing, risk management and green logistics. It does not provide other support services like ICT or repair and maintenance like the Italian model does. These services are all provided by independent companies. FV2 calls the industrial services provided by FVDC “soft services”.

Regarding the internal competition and conflict management, FV2 states that there are no concrete measures because there is no need for that. This is due to the size of the German logistics industry. 3 million people are working for German FVs and the majority of this work force is tried to be transferred from traditional logistics services like transportation or warehousing to value-added logistics services. 150 companies are operating in only FV2. Germany is always on the high rows of LPI and logistics is the third biggest industry in this country. Majority of the logistics activity is handled on contract logistics basis so rival companies do not hesitate to invest in logistics centers due to competition as they have long-term relationships with their customers. Oppositely, they want to invest in order to utilize synergy opportunities in terms of common energy costs or common transportation costs.

Regarding the environmental impact, FV2 states that German freight villages contribute to carbon emission reduction activities by 50.000 tons per year. They initiate green logistics projects inside the centers like green warehousing, development of green buildings and risk management against climate change. Also after Fukushima disaster, in accordance with macro policies, freight villages try to convert to alternative energy resources like wind or sun. So they make new investments within freight village boundaries.

#### **4.1.4.Summary of Qualitative Research**

The qualitative research section involved three consecutive studies employing three different research methods. The outputs of each study were used either in the consecutive study or as inputs for the quantitative research stage. The objective, the sample, the data collection and the results of each step is summarized on Table 19.

**Table 19.** Summary Table for Qualitative Research

| Research Step        | Sample                                                                                                                                                                                                                                                                                    | Date                                                                                                                                                                                                                                                                                            | Place                                                                 | Objective(s)                                                                                                                                                                                                    | Output(s)                                                                                                                                                                                                                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Focus Group          | 6<br><br>(Representing exporters, warehouse operators, land transporters, railways, ports, shipping agencies)                                                                                                                                                                             | 04/07/2011                                                                                                                                                                                                                                                                                      | Izmir-Turkey                                                          | -To explore organizational buying criteria of industrial customers from logistics centers,<br><br>-To generate technical service dimensions of logistics centers.                                               | -Service criteria required were listed<br><br>-Inputs for content analysis step were generated<br><br>-Inputs for survey analysis were generated<br><br>-Big idea of “Coordinating Minister” was generated.                                                                                               |
| Content Analysis     | 142<br><br>(periodicals from 5 institutions related with logistics: 1- UND – UND’nin Sesi Dergisi<br>2- UTIKAD – UTA Lojistik Dergisi<br>3- LODER – Lojistik Dergisi<br>4- Chamber of Shipping – Deniz Ticareti Dergisi<br>5- Mersin Chamber of Shipping – Mersin Deniz Ticareti Dergisi) | The coverage of periodicals: July 2006-July 2011<br><br>The collection of hard copies: 15 June-15 July 2011<br><br>First stage of the content analysis with main keywords: 25 July-25 August, 2011<br><br>Second stage of the content analysis with main keywords: 25 August-25 September, 2011 | Izmir-Turkey                                                          | -To enlarge the sample,<br><br>-To validate the focus group results,<br><br>-To include an organizational buying perspective into the customer expectations or technical characteristics of a logistics center. | -Most frequently repeated terms: railways, sea shipping, competition, customs, cost advantage, warehouse and state approach<br><br>-The same terminology cluster with the literature and focus group<br><br>-Validated the focus group results<br><br>-Enlarged the sample through logistics institutions |
| Interview Set 1      | 5<br><br>(representatives of the publisher institutions that were selected for content analysis)                                                                                                                                                                                          | 09-20 September, 2011.                                                                                                                                                                                                                                                                          | One face-to-face interview in Izmir-Turkey<br>The others via Internet | -To make sure all points are covered regarding the opinions of logistics institutions towards logistics centers                                                                                                 | -Derived dimensions inline with content analysis results: economies of scale, speed, integration, rail transportation, logistics clustering, competition<br><br>-One additional dimension: Security                                                                                                       |
| Interview Set 2: FV1 | 1                                                                                                                                                                                                                                                                                         | 29 April 2012                                                                                                                                                                                                                                                                                   | Face-to-face<br><br>Istanbul-Turkey                                   | -To explore the operations of successful logistics centers, the services provided by these facilities, their                                                                                                    | -Services defined by Italian law<br><br>-One managing company composed of public and private                                                                                                                                                                                                              |

|                      |   |              |                                    |                                                                                                                                                   |                                                                                                                                                                                                                |
|----------------------|---|--------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |   |              |                                    | infrastructure and management styles                                                                                                              | members<br><br>-Some support services like ICT, maintenance and repair provided by the freight village company<br><br>-Views freight village as a real estate development company                              |
| Interview Set 2: FV2 | 1 | 28 June 2012 | Face-to-face<br><br>Bremen-Germany | -To explore the operations of successful logistics centers, the services provided by these facilities, their infrastructure and management styles | -Network of freight villages<br><br>-FVDCs in each member providing soft industrial services<br><br>-Public focus and macro logistics objectives in freight villages<br><br>-Tenants buy the land, do not rent |

#### 4.2. QUANTITATIVE RESEARCH

The quantitative research part is composed of a survey study and the fuzzy QFD application. The survey study was held in order to explore the existing variables that were to be used in QFD application. All the inputs derived from literature review and qualitative research steps were gathered to develop a question form. In addition to that, a section was added for measuring the integration of industrial service buying intention with Webster and Wind's (1972b) organizational buying model. Following these steps, the deduced dimensions for customer expectations and technical characteristics were used to build the house of quality and the relationship matrix was filled out by a selected group of 3PL representatives. The aim of the qualitative research is:

- 1- to explore and group customer expectations from a logistics center,
- 2- to explore and group technical characteristics of a logistics center,
- 3- to explore the impact of certain organizational buying process dimensions on the logistics center service buying decision of industrial customers and,
- 4- to prioritize the technical or service infrastructure of a logistics center with an industrial customer focus.

#### **4.2.1. Survey Research**

The survey research was used for exploration of HoQ dimensions. The question form was developed so as to discover the general tendency of the 3PLs in Turkey towards logistics centers, to explore their demographics, to group their customer expectations and the important technical characteristics under certain factors and also to discover significant factors influencing their purchase decisions.

##### **4.2.1.1. Population and Sampling of Survey Research**

The theoretical lense of this study is based on several marketing schools of thought that involve the customer in the marketing transaction and perceive him/her as an active party. The objective is to include customer expectations into industrial service design of logistics centers. Therefore, the target population should be chosen from the potential customers of such facilities. According to the logistics center literature and successful examples around the world, logistics centers have three main groups of industrial customers. The first group is composed of logistics intermediaries like 3PLs, 4PLs, terminal operators, shipping agencies and other logistics service providers. The second group is composed of exporters, importers, or retailers whom either directly take place inside the logistics center or buy the center's services from the logistics service providers inside. The third group is composed of the support service providers like governmental institutions, banks, hotels or call center.

Because of the vast variety of potential customers, the sampling strategy of the research required a reasonable limitation. In Turkey, the industrial activities of producers or retailers are generally clustered in organized industrial zones or areas with state incentives. In addition to that, their main focus is not on logistics; it is only perceived as a supplementary function so they were excluded from the population of this research.

On the other hand, the support service providers were considered as followers whom would follow the logistics companies and invest in the logistics centers after them. They are also very heterogeneous in terms of the services they provide so they

were again excluded from the population. As a result the target industrial customer group was chosen as the logistics intermediaries in Turkey.

As the population was very large, it was delimited with a representative sample. Judgemental (purposive) sampling method, which is “an improvement on convenience sampling in that researcher applies his/her experience to select cases which are – in the researcher’s judgment- representative or typical” (Fogelman and Comber, 2007: 135), was chosen in order to determine the sample group. Among the Turkish logistics intermediaries, 3PLs and 4PLs operating in Turkey were selected as the target sample. There are different associations representing different logistics intermediaries in Turkey however the most comprehensive one in terms of 3PLs and 4PLs is the Association of International Forwarding and Logistics Service Providers (UTIKAD). Other ones focus on only one segment of intermediaries like solely the shipping agencies or motor carriers.

UTIKAD has 382 member companies representing Turkish logistics intermediaries. According to their logistics services definition, these companies produce a chain of offerings like consolidation, warehousing, materials handling, packaging or distribution using one or more modes of transportation. In addition to these, they support their customers with customs brokerage, insurance, documentation or financial collection services. Some extended offerings range from supply chain solutions or modern information and telecommunication technologies related with logistics services (UTIKAD, 2013).

The individual statistics on Table 20 show the respondents’ gender, age and tenure distribution together with the company’s age and partnership structure. Table 20 also summarizes the descriptives for tenure in the same company, overall work experience and the company age. In the explanation part of the questionnaire, it was requested from the respondent company that, either the purchasing manager or the general manager whom were eligible to evaluate the purchasing intentions of the logistics company filled out the survey form. So their titles were requested as well, in order to validate this request.

**Table 20.** Demographics of the Survey Sample

| Age                   | Frequency | Percentage | Employee Number                 | Frequency | Percentage |
|-----------------------|-----------|------------|---------------------------------|-----------|------------|
| 20-29                 | 11        | 13,6%      | 1-9                             | 8         | 9,9%       |
| 30-39                 | 38        | 46,9%      | 10-49                           | 26        | 32,1%      |
| 40-49                 | 25        | 30,9%      | 50-250                          | 24        | 29,6%      |
| 50-59                 | 6         | 7,4%       | > 250                           | 23        | 28,4%      |
| > 60                  | 1         | 1,2%       | Total                           | 81        | 100,0%     |
| Total                 | 81        | 100,0%     |                                 |           |            |
| Gender                | Frequency | Percentage | Company Age                     | Frequency | Percentage |
| Female                | 24        | 29,6%      | 1-5                             | 12        | 16,2%      |
| Male                  | 57        | 70,4%      | 6-10                            | 9         | 12,2%      |
| Total                 | 81        | 100,0%     | 11-15                           | 13        | 17,6%      |
|                       |           |            | 16-20                           | 9         | 12,2%      |
| Tenure                | Frequency | Percentage | >20                             | 31        | 41,9%      |
| 0-5 years             | 33        | 41,3%      | Total                           | 74        | 100,0%     |
| 6-11 years            | 31        | 38,8%      | Missing                         | 7         |            |
| 12-17 years           | 13        | 16,3%      |                                 | Frequency | Percentage |
| 18-23 years           | 3         | 3,8%       | Foreign                         | 37        | 45,7%      |
| Total                 | 80        | 100,0%     | Partnership                     |           |            |
| Missing               | 1         |            | Domestic                        | 44        | 54,3%      |
|                       |           |            | Total                           | 81        | 100,0%     |
| Total Work Experience | Frequency | Percentage | Percentage of Foreign Ownership | Frequency | Percentage |
| 0-7                   | 15        | 18,8%      | 1-49%                           | 2         | 6,1%       |
| 8-15                  | 28        | 35,0%      | 50-99%                          | 12        | 36,4%      |
| 16-23                 | 28        | 35,0%      | 100%                            | 19        | 57,6%      |
| 24-31                 | 8         | 10,0%      | Total                           | 33        | 100,0%     |
| 32-39                 | 1         | 1,3%       | Missing                         | 4         |            |
| Total                 | 80        | 100,0%     |                                 |           |            |
| Missing               | 1         |            |                                 |           |            |

The frequency tables indicate that, majority of the respondents were between 30 and 49 years old. 70 % of them were males which represented the male dominance in high positions of logistics companies. The tenure in the same company was similar among the first two groups which stated that the middle or high level

managers in Turkish logistics companies either work between 0-5 years in the same company or this period extends till 11 years. It is more difficult to find managers working for the same company for over 11 years.

When the overall work experience in logistics sector of these professionals were analyzed, two groups that have been working for the sector between 8-15 and 16-23 were equal in size and these two groups constituted 70% of the total sample. These were also validated with the mean statistics on Table 21. The average tenure in the same company was calculated as 7,21 years and the average work experience in logistics sector was approximately 15 years. These findings about the sample represents the expertise of the individuals for responding the questions in the survey.

When the company sizes are considered, the majority of the sample falls into middle-sized and large-sized categories. Most of the respondent companies were older than 20 years, however when the responses are analyzed in depth it can be seen that these old companies are foreign ones that have an older history than Turkish logistics firms. The respondents preferred to use the establishment dates of the global company, not the Turkish branch. The mean age of the respondent companies was 27 years.

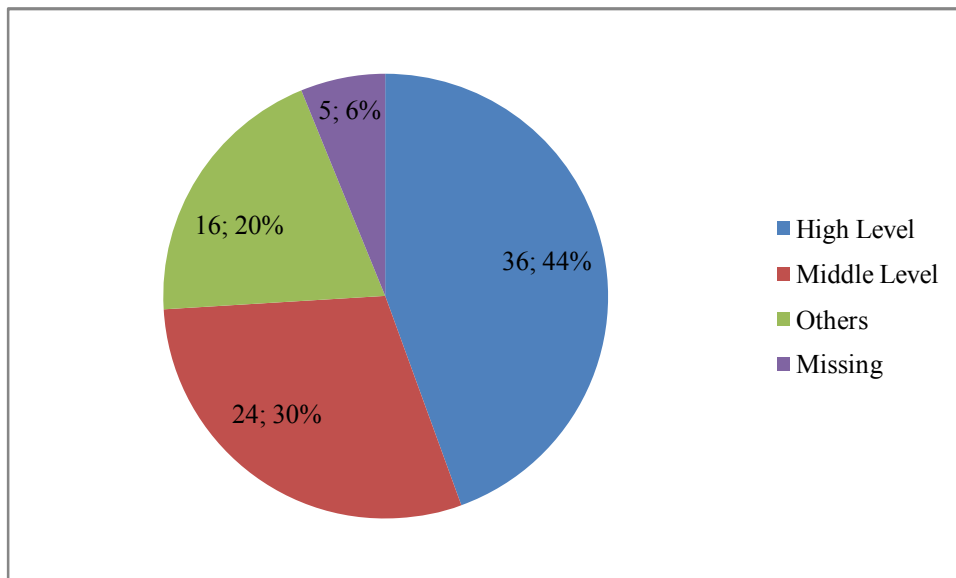
Nearly 46 % of the sample's capital structure was composed of either partly or fully foreign shares. This finding indicates the foreign investment in the Turkish logistics industry. Considering that the European or American counterparts of these companies are investing in the logistics centers at their home countries, it may be assumed that they are more familiar with the concept. Out of the 33 companies that were shared between domestic and foreign capital owners, 56 % totally belonged to foreign enterprises.

**Table 21.** Descriptive Statistics for the Sample

|                 | N  | Minimum | Maximum | Mean    | Std.<br>Deviation |
|-----------------|----|---------|---------|---------|-------------------|
| Tenure          | 80 | 1,00    | 22,00   | 7,2125  | 5,17710           |
| Work Experience | 80 | 1,00    | 36,00   | 14,8250 | 7,30316           |
| Company Age     | 74 | 1       | 167     | 27,00   | 31,327            |

The titles of the respondents were asked in order to validate their decision making authority within the company. It was considered that the higher the title was, the more appropriate was the respondent in replying to survey questions. The titles of the respondents also show the composition of the buying center representatives of the sample. As represented on Figure 26, the majority of the sample is composed of high level managers. This group includes directors, general managers, region managers, partners, board members or company owners. Region managers were included in this group because they are the high level managers for global companies that classify Turkish market as a separate region.

**Figure 26.** Rankings of the Respondents



The middle level managers are composed of the functional managers like marketing, finance or business development managers in the respondent companies and this group has a large share in the sample as well. To summarize, it can be stated that the respondents were authorized to reply about the organizational buying

decisions and their responses represented the companies' overall tendencies regarding the logistics centers.

The service composition of the respondent companies was also subject to analysis. Table 22 below shows the number of companies that responded to offer the listed services. Because of the road transport dominance in the domestic logistics services in Turkey, the transportation modes were separated in order to validate the balance. Additionally, warehousing or port management were inserted to the category list to cover other large shares of logistics activities and port-logistics center integration. An "others" category was added in order to provide an exhaustive list.

**Table 22.**Composition of Logistics Services Provided by the Sample

|                      |    |
|----------------------|----|
| Road Transport       | 57 |
| Air Transport        | 34 |
| Sea Transport        | 52 |
| Rail Transport       | 21 |
| Freight Forwarder    | 48 |
| Intermodal Transport | 27 |
| Port Management      | 7  |
| Warehousing          | 33 |

According to Table 22, majority of the respondents provide different transportation services, sea shipping taking the first place. These companies are generally freight forwarders at the same time and they don't own ships or trucks but they offer these services for a brokerage commission. The least mentioned transportation mode is rail transport due to the state owned structure of the towing car. The ones who provide rail transport services are mostly the large companies who own their own rail cars.

Despite the approximately even distribution of the overall services, port management was only provided by 7 companies. This is an expected result as private ports and terminals are a recent concept in the Turkish market where only undertakers with large capital power invest in this business. Among the "others" category, some of the respondents mentioned project cargo carriage, small package carriage, customs brokerage, foreign trade and retailing.

#### **4.2.1.2. Survey Development and Data Collection Process**

Survey research was chosen as the data collection tool for the first stage of the quantitative analysis part of this study for three main reasons. The first aim was to analyze the overall tendency and perceptions of Turkish 3PLs and 4PLs in terms of logistics centers' different aspects. The second aim was to explore and identify if the customer expectations of technical characteristics of logistics centers can be reduced in specific groups for further analysis by QFD. The third aim was to measure if different independent variables were able to explain the variance in 3PLs' or 4PLs' purchasing decisions of logistics center facilities or services. So the tool measures certain dimensions itself, provides inputs for building the HoQ and integrates organizational buying model theory with the purchasing decision.

The introduction part of the questionnaire contained the profile questions that measured the age, gender, tenure, title and overall work experience of the respondents. The profile questions also explored the demographics of the company through questions exploring the age, partnership structure of the companies and the services that they provide mostly. The findings of this section were exhibited in the sampling and population part for the survey study.

The first part of the questionnaire was composed of 18 items. The first item was asked to measure if the respondent has knowledge about logistics centers. The second group of items were asked in order to measure the perceived requirement for such a facility, the general tendency to buy services or land from the logistics centers and to check the approaches towards the potential competitive forces inside the center. The third group of items were asked in order to measure the preferred management style in a logistics center which is a subject that was frequently mentioned by the interviewees and the academicians whom were consulted for the preparation of the question form. All the items and their resources are listed on Table 23.

**Table 23.** The Question Form Items

|                                                                                                                            |                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                            | <b>I. General Questions (Please respond for your company)</b>                                                                                         |
| To validate that the respondent is eligible to answer questions regarding the logistics center (van Bruggen et al., 2002). | 1. I have adequate information about logistics centers / freight villages.                                                                            |
| To measure the tendency of the organization about the logistics center.                                                    | 2. According to my company, a logistics center is required to be established in the area that we are operating                                        |
|                                                                                                                            | 3. According to my company, adequate demand will arise towards a logistics center established in our area                                             |
|                                                                                                                            | 4. Our company will purchase land from this logistics center.                                                                                         |
|                                                                                                                            | 5. Our company will buy services from this logistics center.                                                                                          |
|                                                                                                                            | 6. Our company does not want to be at the same point with its competitors in the logistics center.                                                    |
|                                                                                                                            | 7. Our company will invest in this logistics center.                                                                                                  |
|                                                                                                                            | 8. Our customers will want us to serve through this logistics center.                                                                                 |
|                                                                                                                            | 9. Our company will invest in the logistics center by direct purchasing.                                                                              |
|                                                                                                                            | 10. Our company will invest in the logistics center by leasing.                                                                                       |
|                                                                                                                            | 11. Our company will shift all of its operations to this area as soon as the logistics center is established.                                         |
|                                                                                                                            | 12. Our company will make the first investments to the logistics center by shifting a part of its operations to this center.                          |
|                                                                                                                            | 13. Our company is aware of the synergy advantage of locating together with its competitors and other related companies.                              |
| Questions related with the management style of logistics centers.                                                          | 14. According to our company, logistics centers have to be managed by a single body.                                                                  |
|                                                                                                                            | 15. According to our company, logistics centers have to be managed by the public authorities.                                                         |
|                                                                                                                            | 16. According to our company, municipalities should also take place in the management of logistics centers.                                           |
|                                                                                                                            | 17. According to our company, logistics centers have to be managed by the private sector.                                                             |
|                                                                                                                            | 18. According to our company, logistics centers have to be managed by public-private-partnership.                                                     |
|                                                                                                                            | <b>II. The expectations of our company from a logistics center to be established in our area are as follows (Customer expectations, WHATs of HoQ)</b> |
| Economic Geography / Neo- Classical Economic School                                                                        | 1. Will decrease our logistics costs.                                                                                                                 |
|                                                                                                                            | 2. Will facilitate the development of intermodal transportation.                                                                                      |
|                                                                                                                            | 3. Will let us utilize economies of scale.                                                                                                            |
| Economies of scale (Jarzenskis, 2007; Notteboom and Rodrigue, 2009)                                                        | 4. Will support us in gaining new customers through common marketing strategies.                                                                      |
|                                                                                                                            | 5. Will support us in reaching qualified human resources through common labor pools.                                                                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Joint marketing<br>(Jarzemskis, 2007)<br>Agglomeration<br>economy- logistics<br>service providers, firms<br>in logistics intensive<br>business, related<br>industries etc. (Elbert et<br>al., 2011)<br>Supplier specialization<br>(Elbert et al., 2011)<br>Shared IT<br>infrastructure<br>(Jarzemskis, 2007)<br>Cost sharing<br>(Jarzemskis, 2007)<br>Ability to reach<br>common sources<br>(Elbert et al., 2011)                                                                                                                                                                                                   | 6. Will provide us specIALIZED vendor source.                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 7. Will decrease our unit costs through the utilization of<br>common transportation infrastructure.                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 8. Will decrease our unit costs through the utilization of<br>common energy infrastructure.                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 9. Will decrease our unit costs through the utilization of<br>common information technology infrastructure.                   |
| Organizational<br>Context/ Industrial<br>District School<br><br>Increased flexibility<br>and responsiveness<br>(Elbert et al., 2011)<br>Increased ability to<br>adapt changes in<br>business environment<br>(Elbert et al., 2011)<br>Increased cooperation<br>within the cluster<br>(Elbert et al., 2011)<br>Interaction with<br>seaports and other<br>inland nodes<br>(Notteboom and<br>Rodrigue, 2009)<br>Vertical and horizontal<br>collaboration<br>efficiencies (Eckhardt<br>and Rantala, 2012)<br>Intermodality benefit<br>(Jarzemskis, 2007)<br>Trust is added by the<br>researcher from<br>Harrison (1992). | 10. Will increase our flexibility and responsiveness.                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11. Will increase our ability to adapt changes in business<br>environment.                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 12. Will increase our cooperation with ports or organized<br>industrial zones.                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 13. Will increase our cooperation with companies similar<br>with us within the logistics center.                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 14. Will increase our cooperation with our suppliers<br>within the logistics center.                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 15. Will increase information sharing within the logistics<br>center.                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 16. Will increase trust among companies within the<br>logistics center.                                                       |
| Business Strategy<br>School – Porter’s<br>Diamond<br><br>Economic<br>Development<br>(Sengpiehl, 2010)<br>Forwarders’ impact<br>(Jarzemskis, 2007)<br>Shared knowledge and<br>skills and knowledge                                                                                                                                                                                                                                                                                                                                                                                                                   | 17. Will maintain proximity for inputs like labor, energy,<br>information or expertise that we use for service<br>production. |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 18. Will maintain the spread of best practices among the<br>companies located inside the logistics center.                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 19. The competition inside the logistics center will foster<br>innovation.                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20. Will increase our service quality.                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 21. The synergy inside the logistics center will increase<br>our impact over demand and supply markets.                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 22. The synergy inside the logistics center will increase<br>our impact on political/legal environment.                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 23. The R&D institutions and university units within the<br>logistics center will develop new logistics solutions.            |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>spillover (Jarzemskis, 2007)</p> <p>Best practice transfers (Elbert et al., 2011)</p> <p>Presence of social and educational institutions (Sengpiehl, 2010)</p> <p>New transport solutions due to synergy (Jarzemskis, 2007)</p> <p>Increased service quality in supply chains (Jarzemskis, 2007)</p> <p>Quality of the whole center (Jarzemskis, 2007)</p> <p>Additional services attracting new business (Jarzemskis, 2007)</p> <p>Ability to effect supply and demand markets (Elbert et al., 2011)</p> <p>Ability to effect governments, policies and scientific institutions (Elbert et al., 2011)</p> | <p>24. Logistics center will provide opportunities to improve our market offerings to our industrial customers.</p>                                   |
| <p>Inserted for expectations related with sustainability considerations</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>25. Logistics center will facilitate the economic growth in our region.</p>                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>26. Logistics center will facilitate the development of social environment in our region.</p>                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>27. Logistics center will decrease the negative impacts of logistics activity on natural environment.</p>                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>III (1). The below given infrastructural units should be prevalent in a logistics center. (PRODUCT/SERVICE CHARACTERISTICS) HOWs of HoQ</b></p> |
| <p>Focus group research results, Content analysis research results, interview results, literature review inputs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>1. Intermodal terminal</p>                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>2. Standard warehouses</p>                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>3. Bonded warehouses</p>                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>4. TIR Parks</p>                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>5. Container yards</p>                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>6. Maintenance and repair centers</p>                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>7. Oil stations</p>                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>8. Working offices</p>                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>9. Postal office</p>                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>10. Security buildings</p>                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>11. Library</p>                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>12. Cold storage facilities</p>                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>13. Tanks (for liquids)</p>                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>14. Bulk cargo facilities</p>                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>15. Open warehouses</p>                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>16. Banks</p>                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>17. Restaurants</p>                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>18. Hotels</p>                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>19. University research units</p>                                                                                                                  |

|  |                                                                                                 |
|--|-------------------------------------------------------------------------------------------------|
|  | 20. Institutions like chamber of commerce, Exporters' Unions etc.                               |
|  | 21. Customs offices                                                                             |
|  | 22. Seaport integration                                                                         |
|  | 23. Rail-road interface                                                                         |
|  | 24. Information technology infrastructure                                                       |
|  | 25. Energy infrastructure                                                                       |
|  | 26. State institutions like ministries or management offices                                    |
|  | 27. Call center                                                                                 |
|  | 28. Disaster management center                                                                  |
|  | 29. Dangerous goods warehouse                                                                   |
|  | 30. Consolidation centers for part loads                                                        |
|  | <b>III (2). Below given services should be provided by a logistics center to its investors.</b> |
|  | 1. One-stop-shopping services                                                                   |
|  | 2. Maintenance and repair services                                                              |
|  | 3. Information and technology services                                                          |
|  | 4. Logistics center marketing services                                                          |
|  | 5. Counseling and solution development services                                                 |
|  | 6. Quality and performance development services                                                 |
|  | 7. Conflict resolution services                                                                 |
|  | 8. Real estate development, sales or rent services                                              |
|  | 9. Supply chain solution services                                                               |
|  | 10. Value added logistics services like packaging, labeling etc.                                |
|  | 11. Safety services                                                                             |
|  | 12. Security services                                                                           |

The second part of the question form was composed of 27 items and an “other” option for free text entries. These items were theoretically grouped into four main approaches. Here the question form combined the cluster theory schools of thought with logistics center literature. The logistics center determinants that were prevalent in the logistics center literature were grouped under cluster theory’s schools by the author. These were the three main schools of Economic Geography, Industrial District and Business Strategy. The references from the logistics center literature are listed on Table 23. These items summarize the potential benefits of investing in such a logistics cluster and therefore were used in order to represent the expectations of the industrial customers from a future logistics center that is to be established around their area. The customer expectations part was developed as the WHATs of the HoQ.

The third part of the question form was composed of two subgroups containing 30 items and 12 items respectively. The first subgroup contained the tangible components of the industrial service offering in a logistics center like the

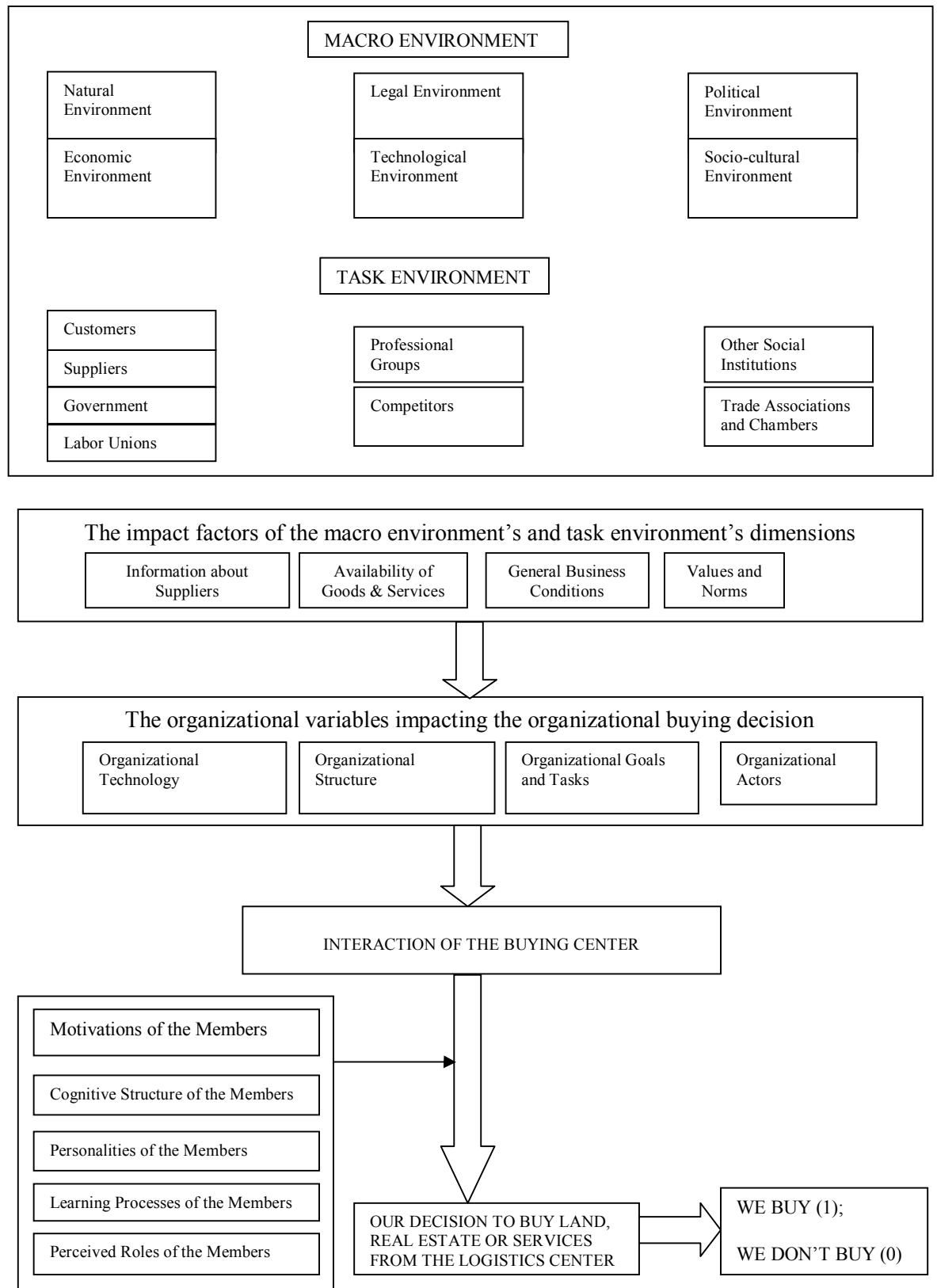
buildings, infrastructure elements and support facilities. The second subgroup contained the intangible components that were closer to pure service offerings. As already mentioned in the qualitative research part of this study, these items were derived from the focus group results, content analysis results, interview results and literature review inputs. These two subgroups exhibit the technical characteristics that should be prevalent in a logistics center. In other words, they are the engineering requirements that are necessary in order to develop the industrial service offering in the logistics center. These were added to the question form in order to provide the inputs for the HOWs part of the HoQ.

In addition to these sections, there was a fourth part where the organizational buying model of Webster and Wind (1972b) was converted into a question form. There were three subgroups in this part where the first part was composed of the six macro environment dimensions, the second part was composed of the eight dimensions of the task environment dimensions and the third part was drawn as a figure to represent the rest of Webster and Wind's (1972b) organizational buying model.

As already explained in the Industrial Buying section of this study, Webster and Wind model has a hierarchical structure of dimensions influencing the final purchasing decision. These dimensions are represented in four main groups. The first group is the environment and has both the macro environment and task environment dimensions in it. Within a containing nature, task environment dimensions are found inside the macro environment dimensions. Task environment dimensions influence the organization through four main determinants listed as (1) information about suppliers, (2) availability of goods and services, (3) general business conditions and (4) values and norms. These determinants have impacts on the organization set which is composed of the organizational technology, organizational structure, organizational goals and tasks and organizational actors. The organization set components affect the interaction within the buying center. The interaction in the buying center is also affected by the motivation of the members, cognitive structure of the members, personalities of the members, learning processes of the members and the perceived roles of the members. Both of these groups – the buying center and the individual members – influence the organizational buying process and the final

purchasing decision. This model is converted into a question form as shown on Figure 27. The impact of each hierarchical dimension was measured independently and the respondents were asked to evaluate the importance degree of each dimension in their final purchasing decision from logistics centers.

**Figure 27.** OBB Question Form



The initial version of the question form was improved through two stages of reviews with academicians and practitioners. Once the question form was prepared, it was sent to 12 academicians working in different science departments like marketing, management and organization, productions management or industrial engineering but conducting research in the field of logistics. They received two documents which were the theoretical framework and the question form. The theoretical framework was explained by a short report to the consulted groups and they were requested to criticize the items in the question form. The consulting process to the academicians was handled through face-to-face interviews where they added or extracted some items, corrected some items and shared their comments regarding the framework and the question form.

After the survey reached its final form it was sent to 12 practitioners from different segments of logistics industry. They were contacted through their e-mail addresses and they were requested to complete the question form. Together with the filled up forms, they commented on the items, added or extracted some items. It was essential to receive their comments in order to control if the items were understandable and as exhaustive as possible.

**Table 24.** Scale Measures

| <b>Sections</b>                                                                 | <b>Scale Type</b>                                               |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Section I (General Questions)                                                   | 5 point Likert – (1) Completely Disagree – (5) Completely Agree |
| Section II (Customer Expectations)                                              | 5 point Likert – (1) Completely Disagree – (5) Completely Agree |
| Section III (Tangible Components and Industrial Services in a Logistics Center) | 5 point Likert – (1) Totally Unimportant – (5) Very Important   |
| Section IV (Impacts of OBB Dimensions on Purchasing Decision)                   | 5 point Likert – (1) Never Affects – (5) Always Affects         |

The scale measures of the different sections in the question form are listed on Table 24. These measures were selected depending on the objective of the related section. The first and second sections were aiming to measure the overall organizational perceptions so the scale was chosen to measure the agreement degree of the respondents. The third section aimed to measure the importance degree of the listed tangible and intangible components of the industrial service offering. The

fourth section aimed to measure the influential power of different dimensions in the organizational buying model for the final purchasing decision. Therefore the scale was chosen to measure the impact.

The questionnaire was sent to the e-mail addresses of the 382 companies listed on UTIKAD's website between 01/05/2013-15/05/2013. Approximately 35 of the e-mail addresses were not reachable. These companies were contacted by telephone or their official web addresses in order to get the correct e-mailing addresses however they were not reachable through these means either. These companies may have been acquired by other companies, may have been closed due to several reasons or may have been only the subsidiary names of other larger logistics companies. As a result the total sample size was decreased to 347 companies.

At the end of the first stage of the mailing process, a total of 62 usable responses were received. Due to the low response rate, a second mailing stage was carried out between 15/05/2013-15/06/2013. At the end of this process, 81 usable responses were received from the target sample group which corresponds to a response ratio of 23 %. This ratio is higher than the threshold of 20% (Yu and Cooper, 1983; Malhotra and Grover, 1998) and is considered as an acceptable response rate for social sciences. Also considering the highly fragmented structure of the Turkish logistics industry, it was essential to collect responses from market leaders firstly as they were assumed to be the first movers in investing a future logistics center, opening the path for the smaller players in the industry.

#### **4.2.1.3. The Analysis of Survey Research**

The analysis of the survey research was held in accordance with the established aims of this research stage. So the below analysis is divided into three subgroups with reference to research objectives.

### ***Descriptive Statistics for Measuring General Tendency***

The general questions part of the question form contained items measuring the perceptions of the respondents regarding the management type, necessity of the logistics centers or organizational tendency to make an organizational buying effort. The mean values of this section were used in order to analyze these perceptions and the results are shown on Table 25.

In addition to that, similar with Stank and Roath's (1998) or Walter and Poist's (2003; 2004) studies the importance rates of infrastructure elements, tangibles and industrial services were analyzed. The results were explored in order to specify the high importance items and compare them with low importance items (Tables 26 and 27).

**Table 25.** Descriptive Statistics for the General Tendency

|                                                                                                                              | N  | Mean   | Std.<br>Deviation |
|------------------------------------------------------------------------------------------------------------------------------|----|--------|-------------------|
| 17. According to our company, logistics centers have to be managed by the private sector.                                    | 80 | 4,0000 | 1,13628           |
| 2. According to my company, a logistics center is required to be established in the area that we are operating               | 80 | 3,7250 | 1,09052           |
| 5. Our company will buy services from this logistics center.                                                                 | 80 | 3,6375 | 1,15006           |
| 1. I have adequate information about logistics centers / freight villages.                                                   | 80 | 3,6375 | 1,24518           |
| 3. According to my company, adequate demand will arise towards a logistics center established in our area                    | 80 | 3,5500 | 1,10121           |
| 13. Our company is aware of the synergy advantage of locating together with its competitors and other related companies.     | 80 | 3,4000 | 1,20757           |
| 4. Our company will purchase land from this logistics center.                                                                | 80 | 3,3500 | 1,27389           |
| 14. According to our company, logistics centers have to be managed by a single body.                                         | 80 | 3,3250 | 1,30019           |
| 8. Our customers will want us to serve through this logistics center.                                                        | 80 | 3,0625 | 1,07142           |
| 10. Our company will invest in the logistics center by leasing.                                                              | 80 | 3,0125 | 1,21690           |
| 12. Our company will make the first investments to the logistics center by shifting a part of its operations to this center. | 80 | 2,8375 | 1,22675           |
| 18. According to our company, logistics centers have to be managed by public-private-partnership.                            | 80 | 2,7250 | 1,37772           |
| 7. Our company will invest in this logistics center.                                                                         | 80 | 2,5875 | 1,20855           |
| 16. According to our company, municipalities should also take place in the management of logistics centers.                  | 80 | 2,3625 | 1,30475           |
| 9. Our company will invest in the logistics center by direct purchasing.                                                     | 80 | 2,3125 | 1,17564           |
| 6. Our company does not want to be at the same point with its competitors in the logistics center.                           | 80 | 2,2625 | 1,20908           |
| 11. Our company will shift all of its operations to this area as soon as the logistics center is established.                | 80 | 2,2250 | 1,15808           |
| 15. According to our company, logistics centers have to be managed by the public authorities.                                | 80 | 1,7875 | 1,05175           |
| Valid N (listwise)                                                                                                           | 80 |        |                   |

When Table 25 is analyzed, it can be seen that the mean values do not have a high leniency. The highest and the lowest means belong to the items related with the management type. The sample is highly reluctant about public intervention in the management of logistics centers. Even public-private partnership or municipality shares in the management of such facilities have low mean scores. This finding is inline with the focus group discussions and additional comments received from respondents. The logistics industry wants the state to leave the management of industrial initiatives to private sector. The state governance methods slow down

logistics processes which require a high level of responsiveness in today's business world. This results in the diminished competitiveness of Turkish logistics business and poor service levels. These can be among the reasons for the high emphasis on private sector management for logistics centers.

The second and the fifth rows are related with the necessity of such a facility and the perceived potential demand towards logistics centers. Both items have above-average means which can be evaluated as a positive tendency among the logistics sector towards such an initiative. However, the means about purchasing land or overall investment in the logistics center are low. It seems that the overall tendency is to buy industrial services first through the logistics center and try the market offering as an outsider in the beginning. The sample does not think of shifting all operations to the center as soon as the facility is established.

The knowledge level of the respondents about the logistics center is above average but still not very high. This is understandable as the existing initiatives are either held by the state authorities and not communicated with the public at high rates or governed by the private sector and keep a low profile until operations are started due to competitive considerations. Additional informative communications are required in this area towards 3PLs and 4PLs through industrial organizations like chambers or associations.

One other important finding from this analysis is related with the internal synergy perceptions and hesitations regarding internal competition. A reverse coded question was deliberately asked in order to emphasize the tendency of the sample regarding the competition inside the logistics center. In sectoral meetings or individual interviews, majority of the company representatives were reluctant about clustering at the same area with their leading competitors. They thought that this would cause them lose market share or lose customers. Although the mean score is high for the perceived synergy advantage of locating together with the competitors, the mean score for the reverse coded competition question (Question 6) is still not as low as it should be. This score proves that the hesitation is continued among the sample so the marketing communications and informative sessions should cover this issue comprehensively and try to convince the industry representatives that the

internal competition can be utilized as an advantage instead of being perceived as a threat.

**Table 26.** Descriptive Statistics for the Tangible Components

|                                                               | N  | Mean   | Std.<br>Deviation |
|---------------------------------------------------------------|----|--------|-------------------|
| Intermodal terminal                                           | 81 | 4,7901 | ,56383            |
| Information technology infrastructure                         | 81 | 4,7531 | ,66202            |
| Rail-road interface                                           | 81 | 4,7284 | ,72478            |
| Seaport integration                                           | 81 | 4,6667 | ,83666            |
| Energy infrastructure                                         | 81 | 4,5802 | ,84947            |
| Consolidation centers for part loads                          | 81 | 4,5309 | ,75971            |
| Customs offices                                               | 81 | 4,4938 | ,97626            |
| Working offices                                               | 81 | 4,4691 | ,72606            |
| Container yards                                               | 81 | 4,4321 | ,90745            |
| Bonded warehouses                                             | 81 | 4,4198 | ,93360            |
| TIR Parks                                                     | 81 | 4,4074 | ,94575            |
| Open warehouses                                               | 81 | 4,2840 | ,91152            |
| Dangerous goods warehouse                                     | 81 | 4,2099 | 1,09220           |
| Security buildings                                            | 81 | 4,1975 | 1,01759           |
| Standard warehouses                                           | 81 | 4,1235 | 1,13339           |
| Banks                                                         | 81 | 4,1111 | 1,11803           |
| Cold storage facilities                                       | 81 | 4,0247 | 1,17234           |
| Maintenance and repair centers                                | 81 | 4,0247 | ,99969            |
| Restaurants                                                   | 81 | 4,0123 | 1,08965           |
| Institutions like chamber of commerce, Exporters' Unions etc. | 81 | 3,8889 | 1,18322           |
| Oil stations                                                  | 81 | 3,8765 | 1,20813           |
| Disaster management center                                    | 81 | 3,8642 | 1,23241           |
| Tanks (for liquids)                                           | 81 | 3,7284 | 1,25511           |
| Bulk cargo facilities                                         | 81 | 3,6914 | 1,29076           |
| Postal office                                                 | 81 | 3,5802 | 1,21310           |
| Call center                                                   | 81 | 3,4444 | 1,26491           |
| State institutions like ministries or management offices      | 81 | 3,4321 | 1,25438           |
| Hotels                                                        | 81 | 3,2099 | 1,27197           |
| University research units                                     | 81 | 3,2099 | 1,28176           |
| Library                                                       | 81 | 2,7037 | 1,26930           |
| Valid N (listwise)                                            | 81 |        |                   |

Table 26 and Table 27 show the importance perceptions regarding the tangible and intangible components of the logistics center's market offering. When the infrastructure elements are analyzed, it is seen that among the top ten most important articles the transportation infrastructure elements are represented by intermodal terminal, rail-road interface and seaport integration. Among storage and

logistics services, consolidation centers, container yards, bonded warehouses are perceived to be highly important. Energy, information technology infrastructure and working offices are intermediaries that would facilitate the business through the center. Customs offices are perceived highly important as they are essential components for the smooth and fast transaction of cargo through the gates.

The highest rank among the industrial services that should be provided by the logistics centers are shared by one-stop-shopping, security, safety and information technology services. Supply chain solution offerings and value added logistics services are also perceived to be highly important by the respondents. However, when the foreign successful examples of such facilities are analyzed, it can be seen that such services are not provided by the logistics center but by several residents of the center. So service providers that develop such market offerings should be attracted to the area in order to respond these demands.

**Table 27.** Descriptive Statistics for the Intangible Components

|                                                              | N  | Mean   | Std.<br>Deviation |
|--------------------------------------------------------------|----|--------|-------------------|
| One-stop-shopping services                                   | 81 | 4,4444 | ,83666            |
| Security services                                            | 81 | 4,4074 | ,83333            |
| Safety services                                              | 81 | 4,2963 | ,91439            |
| Information and technology services                          | 81 | 4,2716 | ,98758            |
| Value added logistics services like packaging, labeling etc. | 81 | 4,1728 | 1,02213           |
| Supply chain solution services                               | 81 | 4,0864 | ,98992            |
| Counseling and solution development services                 | 81 | 3,9259 | 1,11555           |
| Logistics center marketing services                          | 81 | 3,9012 | 1,15764           |
| Quality and performance development services                 | 81 | 3,8889 | 1,09545           |
| Maintenance and repair services                              | 81 | 3,7778 | 1,16190           |
| Conflict resolution services                                 | 81 | 3,7284 | 1,16203           |
| Real estate development, sales or rent services              | 81 | 2,9630 | 1,12299           |
| Valid N (listwise)                                           | 81 |        |                   |

The lowest rank of the importance scales, on the other hand, are shared by postal offices, state buildings, hotels, call centers, university research units and library in terms of tangibles. However, one of the successful examples of logistics centers, Zaragoza, is also the host of the Zaragoza University's unit that is providing master's or doctoral degrees in logistics and the logistics research lab of the same university. Another example is the Institute for Shipping Economics and Logistics in Germany that conducts research and consulting services for German Freight Villages that are coordinated under the roof of Deutsche GVZ-Gesellschaft mbH(DGG). Therefore, the perceived importance of such units should be increased in order to improve Turkish logistics services inline with the global successful examples.

Among the intangibles, the least mean score belongs to real estate development services. This was a term mentioned by Italy's Verona Freight Village where they develop buildings or other logistics service areas and then lease them to the investors. However, it is seen that such services are not perceived to be important for Turkish industry representatives. Once they invest in these facilities, they will be needing real estate services consequently. Therefore, the logistics center undertakers should plan and communicate these services as well to their potential customers.

In addition to these, for both tangibles and intangibles an "others" option was included in order to reach an exhaustive list. Some of the respondents added items to

these sections as well. The other facilities added to the tangibles part were praying rooms, green fields, conference halls, specialized customs offices, training and seminar rooms, waiting lounge, sports area, social facilities for drivers, bicycle tracks, connections with urban transportation systems, closed-circuit television facilities, insurance, surveyor companies, fire brigade, small package carriage companies and airport connections. The other services that were required by the respondents were B2B services, research and development services, technical support services and worker health and safety services. One respondent emphasized the importance of objective and fair management principles and the availability of internationally accredited auditor services.

A summary of the descriptive statistics is shown on Table 28. The analysis of this table shows the general tendency of the Turkish LSPs towards logistics centers. The list also shows the most and the least important service dimensions according to the respondents.

**Table 28.** Summary Table for Descriptive Statistics

| Survey Section                                        | Top Three Items                                                                                             | Last Three Items                                                                                          |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| General Tendency                                      | According to our company, logistics centers have to be managed by the private sector.                       | Our company does not want to be at the same point with its competitors in the logistics center.           |
|                                                       | According to my company, a logistics center is required to be established in the area that we are operating | Our company will shift all of its operations to this area as soon as the logistics center is established. |
|                                                       | Our company will buy services from this logistics center.                                                   | According to our company, logistics centers have to be managed by the public authorities.                 |
| Tangible Components of the Logistics Center Service   | Intermodal terminal                                                                                         | Hotels                                                                                                    |
|                                                       | Information technology infrastructure                                                                       | University research units                                                                                 |
|                                                       | Rail-road interface                                                                                         | Library                                                                                                   |
| Intangible Components of the Logistics Center Service | One-stop-shopping services                                                                                  | Maintenance and repair services                                                                           |
|                                                       | Security services                                                                                           | Conflict resolution services                                                                              |
|                                                       | Safety services                                                                                             | Real estate development, sales or rent services                                                           |

### ***Factor Analysis for QFD Inputs***

The second aim of the survey research was to reduce customer expectations and technical characteristics that were measured in different sections of the questionnaire into certain dimensions in order to be used in the relationship matrix of HoQ. Exploratory factor analysis (EFA) method was used in order to discover and name factor groups.

Hair et al's (2006) EFA methodology was taken as basis in order to discover the factors. An examination of the correlation matrix was held at first for assuring the factorability of the variables. It is essential to control the correlation matrix as items that have no correlations with other factors may not be the part of any factor. On the other hand, high correlations among variables may state that the item is a part of more than one factor. Therefore non-correlated or highly correlated items were examined and removed if necessary. After that EFA with Varimax rotation was applied, the factors were analyzed and named accordingly.

The first EFA was applied to the customer expectations part which is represented by Section II in the questionnaire. The questions here were derived from the three main schools of cluster theory and three questions were added in order to represent sustainability expectations. Before applying EFA, the correlation matrix for the 27 items in this sub-scale was analyzed. Out of the 351 available correlations, 349 of them were significant at 0,01 level with a ratio of 99,4%. This result provides an adequate level for conducting factor analysis to the available data.

After that the correlation table was analyzed in order to sort out the highly inter-correlated items. The sufficiency of the correlations among the items was tested through Barlett's test of sphericity. Barlett's test confirmed that the correlations were significant at 0,0001 level when taken collectively. Although there are no certain thresholds for high correlations, for this study 70 % was considered to be high and the items that had correlations over 70 % with other items were listed. These were used to detect the double loadings during the factor analysis process. When the factor analysis was rotated, the highly correlated items were found to be loaded on two or three factors so they were selected and removed from the item list as they were perceived to explain more than one dimension regarding customer expectations. The factor analysis was rotated after 10 items were extracted and the remaining 17 items were loaded on four factors as shown on Table 29.

**Table 29.** Factor Analysis Results for Customer Expectations

|                                                                                                                           | Factors               |                             |                     |                |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------|---------------------|----------------|
|                                                                                                                           | Competitive Advantage | Efficiency & Responsiveness | Cooperation & Trust | Sustainability |
| BS5 / The synergy inside the logistics center will increase our impact on political/legal environment.                    | ,855                  |                             |                     |                |
| ID2 / Will increase our ability to adapt changes in business environment.                                                 | ,802                  |                             |                     |                |
| ID8 / Will maintain proximity for inputs like labor, energy, information or expertise that we use for service production. | ,744                  |                             |                     |                |
| EG6 / Will provide us specizalized vendor source.                                                                         | ,733                  |                             |                     |                |
| BS2 / The competition inside the logistics center will foster innovation.                                                 | ,704                  |                             |                     |                |
| BS1 / Will maintain the spread of best practices among the companies located inside the logistics center.                 | ,633                  |                             |                     |                |
| BS4 / The synergy inside the logistics center will increase our impact over demand and supply markets.                    | ,606                  |                             |                     |                |
| BS7 / Logistics center will provide opportunities to improve our market offerings to our industrial customers.            |                       | ,802                        |                     |                |
| ID1 / Will increase our flexibility and responsiveness.                                                                   |                       | ,779                        |                     |                |
| EG2 / Will facilitate the development of intermodal transportation.                                                       |                       | ,663                        |                     |                |
| EG1 / Will decrease our logistics costs.                                                                                  |                       | ,602                        |                     |                |
| ID4 / Will increase our cooperation with companies similar with us within the logistics center.                           |                       |                             | ,859                |                |
| ID6 / Will increase information sharing within the logistics center.                                                      |                       |                             | ,844                |                |
| ID7 / Will increase trust among companies within the logistics center.                                                    |                       |                             | ,653                |                |
| SUS3 / Logistics center will decrease the negative impacts of logistics activity on natural environment.                  |                       |                             |                     | ,798           |
| SUS2 / Logistics center will facilitate the development of social environment in our region.                              |                       |                             |                     | ,771           |
| SUS1 / Logistics center will facilitate the economic growth in our region.                                                |                       |                             |                     | ,624           |
| Eigenvalues                                                                                                               | 9,378                 | 1,235                       | 1,191               | 1,125          |
| % of Variance Explained                                                                                                   | 55,165                | 7,263                       | 7,006               | 6,615          |

In a factor analysis, in order to get reliable factor solutions the sample size should be adequate and the factor loadings should be high (Field, 2000). In order to test the sample size adequacy Kaiser-Meyer-Olkin test was applied and the KMO ratio was 90,8 %. Values above 50% are considered to be appropriate for exploratory factor analysis (Hair et al., 2006). The analysis showed that four factors explained 76,05 % of the total variance in this subscale which is an acceptable ratio for social sciences.

The internal consistency of the scale items was measured with Cronbach's Alpha. The reliability of the overall subscale was 94,8 % for 17 items which is above the threshold of 70 % (Cortina, 1993). The Cronbach's Alpha values for four factors were calculated as 93,4 %, 84,6 %, 89,9 % and 80,7 % respectively. In addition to these measures, inter-item correlations were analyzed within the factor items and these values were all above the threshold value of 30 % (Hair et al., 2006).

The factor numbers on Table 29 were labeled with abbreviations of cluster theory schools. EG represents Economic Geography, ID represents Industrial Districts, BS represent Business Strategy and SUS represents Sustainability. It was observed that SUS and ID items were loaded on the same factor as already has been theorized. However the first two factors have items from all three cluster theory schools. Therefore they were named according to the items loaded in each factors: competitive advantage, efficiency and responsiveness, cooperation and trust and sustainability respectively.

After the customer expectations were grouped under four factors, the same procedure was conducted for the technical characteristics which were represented by two subscales containing tangible components and intangible components of the market offering. The factor tables for tangibles and intangibles are listed on Table 30 and Table 31.

**Table 30.** Factor Analysis Results for Tangible Components of the Service Offering

|                                                               | Factors          |                     |                  |                      |                 |
|---------------------------------------------------------------|------------------|---------------------|------------------|----------------------|-----------------|
|                                                               | Support Services | Main Infrastructure | W/H & Intermodal | Secondary Supporters | Special Storage |
|                                                               | Reliabilities    |                     |                  |                      |                 |
| Cronbach's Alpha                                              | 89 %             | 90 %                | 86 %             | 83 %                 | 87 %            |
| Call Centers                                                  | ,796             |                     |                  |                      |                 |
| Hotels                                                        | ,760             |                     |                  |                      |                 |
| Restaurants                                                   | ,759             |                     |                  |                      |                 |
| Library                                                       | ,716             |                     |                  |                      |                 |
| Disaster Management Center                                    | ,700             |                     |                  |                      |                 |
| University Research Units                                     | ,687             |                     |                  |                      |                 |
| Institutions like chamber of commerce, Exporters' Unions etc. | ,518             |                     |                  |                      |                 |
| Rail-Road Interface                                           |                  | ,914                |                  |                      |                 |
| Seaport Integration                                           |                  | ,843                |                  |                      |                 |
| Information Technology Infrastructure                         |                  | ,721                |                  |                      |                 |
| Energy Infrastructure                                         |                  | ,708                |                  |                      |                 |
| Customs Offices                                               |                  | ,682                |                  |                      |                 |
| Consolidation Centers for Part Loads                          |                  |                     | ,816             |                      |                 |
| Bonded Warehouses                                             |                  |                     | ,740             |                      |                 |
| Open Warehouses                                               |                  |                     | ,691             |                      |                 |
| Intermodal Terminal                                           |                  |                     | ,625             |                      |                 |
| Standards Warehouses                                          |                  |                     | ,593             |                      |                 |
| Container Yards                                               |                  |                     | ,518             |                      |                 |
| Oil Stations                                                  |                  |                     |                  | ,769                 |                 |
| Working Offices                                               |                  |                     |                  | ,684                 |                 |
| TIR Parks                                                     |                  |                     |                  | ,681                 |                 |
| Postal Office                                                 |                  |                     |                  | ,655                 |                 |
| Security Buildings                                            |                  |                     |                  | ,621                 |                 |
| Bulk Cargo Facilities                                         |                  |                     |                  |                      | ,840            |
| Tanks (for Liquids)                                           |                  |                     |                  |                      | ,828            |
| Cold Storage Facilities                                       |                  |                     |                  |                      | ,714            |
| Eigenvalues                                                   | 9,937            | 3,048               | 2,321            | 1,707                | 1,161           |
| % of Variance Explained                                       | 38,219           | 11,724              | 8,926            | 6,564                | 4,464           |

The tangible part of the technical characteristics were grouped under five main factors which constitute the 70 % of the overall variance in this subscale. Bartlett's Test of Sphericity was significant at 0,0001 level so the scale was valid for EFA. The KMO ratio was 82 % which is over the threshold value of 50 % and therefore the sample was accepted to be adequate for the factor analysis. The

Cronbach's Alpha values are listed on the tables. The factors were named according to the functions that were grouped under them.

**Table31.** Factor Analysis Results for Intangible Components of the Service Offering

|                                                              | Factors                 |                      |
|--------------------------------------------------------------|-------------------------|----------------------|
|                                                              | Value Added<br>Services | Standard<br>Services |
|                                                              | Reliabilities           |                      |
|                                                              | 87%                     | 83%                  |
| Logistics center marketing services                          | ,862                    |                      |
| Supply chain solution services                               | ,802                    |                      |
| Quality and performance development services                 | ,780                    |                      |
| Consulting and solution development services                 | ,749                    |                      |
| Value added logistics services like packaging, labeling etc. | ,640                    |                      |
| Conflict resolution services                                 | ,542                    |                      |
| One-stop-shopping services                                   | ,511                    |                      |
| Safety services                                              |                         | ,915                 |
| Security services                                            |                         | ,869                 |
| Information and technology services                          |                         | ,723                 |
| Maintenance and repair services                              |                         | ,602                 |
| Real estate development, sales or rent services              |                         | ,475                 |
| Eigenvalues                                                  | 5,577                   | 1,636                |
| % of Variance Explained                                      | 46,473                  | 13,635               |

The intangible part of the technical characteristics were grouped under two main factors which constitute the 60 % of the overall variance in this subscale. Bartlett's Test of Sphericity was significant at 0,0001 level so the scale was valid for EFA. The KMO ratio was 83 % which is over the threshold value of 50 % and therefore the sample was accepted to be adequate for the factor analysis. The Cronbach's Alpha values are listed on the tables. The factors were named according to the services that were grouped under them. Together with the tangibles part these groups will constitute the HOWs of HoQ; i.e. the technical characteristics. The summary of all factors derived from the EFA process, their explanation powers and reliability degrees are listed on Table 32.

**Table 32.** Summary of Factor Analysis

| Survey Sections                                       | Factor Names                | Cronbach's Alpha | % of Variance Explained |
|-------------------------------------------------------|-----------------------------|------------------|-------------------------|
| Customer Expectations                                 | Competitive Advantage       | 93,4 %           | 55,165                  |
|                                                       | Efficiency & Responsiveness | 84,6 %           | 7,263                   |
|                                                       | Cooperation & Trust         | 89,9 %           | 7,006                   |
|                                                       | Sustainability              | 80,7 %           | 6,615                   |
| Tangible Components of the Logistics Center Service   | Support Services            | 89 %             | 38,219                  |
|                                                       | Main Infrastructure         | 90 %             | 11,724                  |
|                                                       | W/H & Intermodal            | 86 %             | 8,926                   |
|                                                       | Secondary Supporters        | 83 %             | 6,564                   |
|                                                       | Special Storage             | 87 %             | 4,464                   |
| Intangible Components of the Logistics Center Service | Value-Added Services        | 87%              | 46,473                  |
|                                                       | Standard Services           | 83%              | 13,635                  |

### ***Testing the Independent Variables Affecting Purchasing Decisions***

At this part of the survey research, it was aimed to explain the variance in the purchasing decision of industrial customers regarding the market offerings of a logistics center. There were different independent variables hypothesized to explain this variance at different sections of the question form.

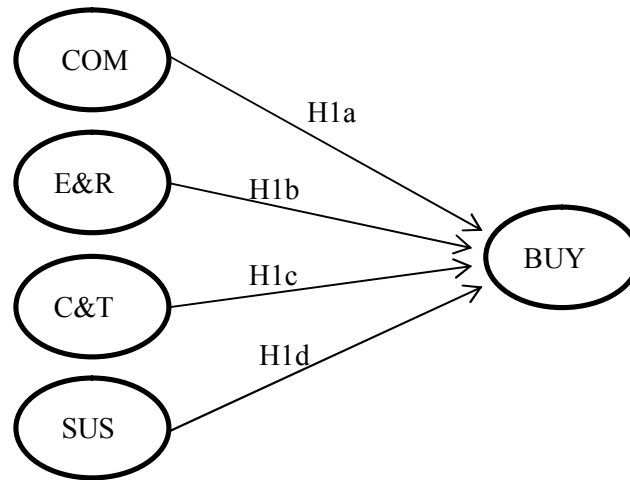
The first group of independent variables were derived from the section that measured the customer expectations from clustering within a logistics center. As already explored and deduced in the factor analysis part, there were four main factors that the expectations of industrial customers were grouped under. These were named as Competitive Advantage, Efficiency and Responsiveness, Cooperation and Trust and Sustainability. The number of factors were in accordance with the three main cluster theory schools of thought plus added sustainability items. However the distribution of the items were not the same with the theory so they were given new labels as per above.

The first factor, competitive advantage, had four items from business strategy school and that was the reason of this labeling. Although it had items related with adaptability and proximity advantages from the two other schools of thought, they all were expected to result in competitive advantages for the resident. The second factor had two items from economic geography school but it also had two items from the other two schools. When the items were explored it was evaluated that all of them

emphasized either efficiency of operations or responsiveness for market requirements. The third factor had all its items from industrial district school and it was a typical set of items related with cooperation and trust within the center. Finally the last factor had all its items from sustainable development's triple bottomline and therefore it is labeled as sustainability.

As a result of this factor analysis, it was concluded that the industrial customers of a logistics center were expecting increased competitive advantage, increased efficiency and responsiveness, increased cooperation and trust within the residents and improved triple bottomline impacts from a logistics center. Following these factors, it was questioned if these expectations facilitated the industrial customers' buying decisions at all. The sample's tendency about buying either land or services and their intention to invest in the logistics center were asked in the first section of the questionnaire. These three questions were grouped under one variable named as the buying intention and the relationships between the four independent variables derived from the customer expectations part and the buying intention were questioned. The research model for this analysis is given on Figure 28.

**Figure 28.** Research Model for Stepwise Regression Analysis I



As these customer expectations are believed to facilitate the industrial customers buying intentions of industrial services or land from the logistics centers, the hypotheses for this analysis are listed as per below:

**H1: There is a positive and significant relationship between the customers’ expectations and their organizational buying intentions from logistics centers.**

H1a: There is a positive and significant relationship between the customers’ expectations regarding competitive advantage and their organizational buying intentions from logistics centers.

H1b: There is a positive and significant relationship between the customers’ expectations regarding efficiency and responsiveness and their organizational buying intentions from logistics centers.

H1c: There is a positive and significant relationship between the customers’ expectations regarding cooperation and trust and their organizational buying intentions from logistics centers.

H1d: There is a positive and significant relationship between the customers’ expectations regarding sustainability and their organizational buying intentions from logistics centers.

In order to measure these relationships, the dependent variable of buying intention (BUY) was developed as a new variable from the means of below given items:

1. Our company will purchase land from this logistics center.
2. Our company will buy services from this logistics center.
3. Our company will invest in this logistics center.

**Table 33.**Model Summary for Stepwise Regression I

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | ,389 <sup>a</sup> | ,151     | ,141              | ,95943                     |
| 2     | ,467 <sup>b</sup> | ,218     | ,198              | ,92690                     |
| 3     | ,513 <sup>c</sup> | ,263     | ,234              | ,90600                     |

a. Predictors: (Constant), E&R

b. Predictors: (Constant), E&R; COM

c. Predictors: (Constant), E&R; COM; C&T

The four independent variables were analyzed with a stepwise regression analysis in order to measure their predictive power on the dependent variable. The model summary on Table 33 shows that three models were tried by stepwise regression analysis and the third model containing three independent variables, indicated the best predictive power with its adjusted R square score of 23%.

**Table 34.** Coefficients<sup>a</sup> for Stepwise Regression I

| Model        | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|--------------|-----------------------------|------------|---------------------------|--------|------|
|              | B                           | Std. Error | Beta                      |        |      |
| 1 (Constant) | 3,192                       | ,107       |                           | 29,762 | ,000 |
| E&R          | ,400                        | ,107       | ,389                      | 3,731  | ,000 |
| 2 (Constant) | 3,197                       | ,104       |                           | 30,842 | ,000 |
| E&R          | ,401                        | ,104       | ,390                      | 3,869  | ,000 |
| COM          | ,268                        | ,105       | ,258                      | 2,564  | ,012 |
| 3 (Constant) | 3,200                       | ,101       |                           | 31,581 | ,000 |
| E&R          | ,402                        | ,101       | ,390                      | 3,963  | ,000 |
| COM          | ,272                        | ,102       | ,262                      | 2,660  | ,010 |
| C&T          | ,219                        | ,102       | ,211                      | 2,143  | ,035 |

a. Dependent Variable: BUY

The coefficients on Table 34 state that although all three models are significant, the third model with three independent variables explain the variance in the dependent variable with a greater strength. 39% of the variance in buying intention is explained by the customer expectations regarding efficiency and responsiveness which is a similar result with the focus group analysis responses and content analysis results related with cost reduction. 26% of the variance in buying intention is explained by the expected competitive advantage that clustering in a logistics center would generate. Finally, 21% of the variance in buying intention is explained by the cooperation and trust expectations of industrial customers. The sign of these coefficients are positive so the relationship between the independent variables and the dependent variable is positive as already hypothesized. The regression model and the hypothesis results are listed as per below.

$$\text{BUY} = 3,2000 + 0,390\text{E\&R} + 0,262\text{COM} + 0,211\text{C\&T}$$

Three of the four hypotheses (H1a, H1b, H1c) were supported at the end of the analysis and only one hypothesis was rejected (H1d). There weren't any relationships between the customer expectations related with sustainability and their purchasing intentions. This means that the customers have priorities regarding competitive advantage, efficiency and responsiveness, cooperation and trust but not about sustainable development's triple bottomline for the moment.

Although the variables explained the overall purchasing intention of industrial customers from a logistics center partly, it was also questioned if different sections of this purchasing intention were explained by different variables. The buying intention variable was composed of three different items related with land purchasing, service purchasing and general investment. These items were taken as individual dependent variables to seek which customer expectation(s) had a predictive power on which purchasing intention. This resulted in three new research models which are shown on Figure 29.

The main hypotheses for these three research models and their sub hypotheses are listed below. They were again analyzed with stepwise regression analysis and the summary tables are given following the hypotheses.

**H2: There is a positive and significant relationship between the customer expectations and their intentions of buying land from logistics centers.**

H2a: There is a positive and significant relationship between the customer expectations regarding competitive advantage and their intentions of buying land from logistics centers.

H2b: There is a positive and significant relationship between the customer expectations regarding efficiency and responsiveness and their intentions of buying land from logistics centers.

H2c: There is a positive and significant relationship between the customer expectations regarding cooperation and trust and their intentions of buying land from logistics centers.

H2d: There is a positive and significant relationship between the customer expectations regarding sustainability and their intentions of buying land from logistics centers.

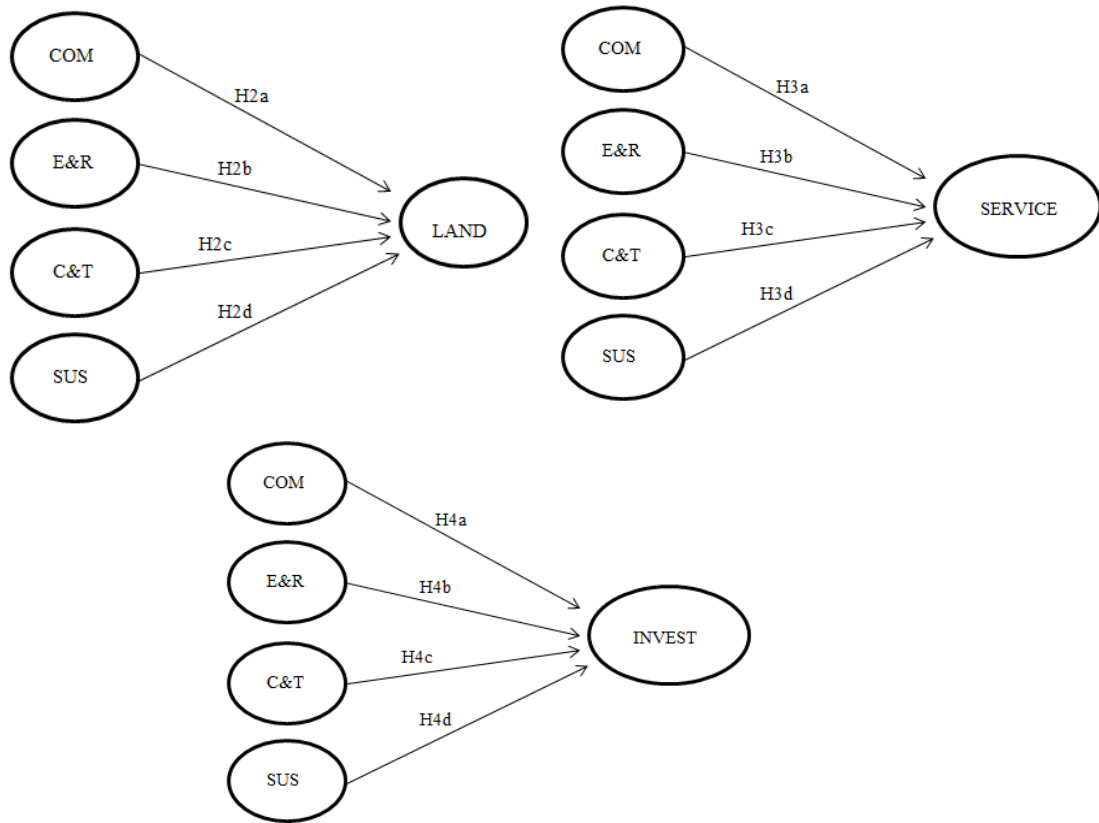
**H3: There is a positive and significant relationship between the customer expectations and their intentions of buying services from logistics centers.**

H3a: There is a positive and significant relationship between the customer expectations regarding competitive advantage and their intentions of buying services from logistics centers.

H3b: There is a positive and significant relationship between the customer expectations regarding efficiency and responsiveness and their intentions of buying services from logistics centers.

H3c: There is a positive and significant relationship between the customer expectations regarding cooperation and trust and their intentions of buying services from logistics centers.

**Figure 29.** Research Model for Stepwise Regression Analysis II



H3d: There is a positive and significant relationship between the customer expectations regarding sustainability and their intentions of buying services from logistics centers.

H4: There is a positive and significant relationship between the customer expectations and their intentions to invest in logistics centers.

H4a: There is a positive and significant relationship between the customer expectations regarding competitive advantage and their intentions to invest in logistics centers.

H4b: There is a positive and significant relationship between the customer expectations regarding efficiency and responsiveness and their intentions to invest in logistics centers.

H4c: There is a positive and significant relationship between the customer expectations regarding cooperation and trust and their intentions to invest in logistics centers.

H4d: There is a positive and significant relationship between the customer expectations regarding sustainability and their intentions to invest in logistics centers.

The model summary and the coefficients table on Table 35 and Table 36 show that only H2b and H2a were supported by the analysis. The industrial customers will tend to buy land from logistics centers only if their expectations regarding the efficiency and responsiveness they will generate from the center and the competitive advantage that they will benefit by clustering in the center increase. The cooperation and trust or sustainability expectations do not explain the variance in land purchasing intentions.

**Table 35.** Model Summary for Stepwise Regression II- Dependent Variable: LAND

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | ,333 <sup>a</sup> | ,111     | ,100              | 1,20873                    |
| 2     | ,412 <sup>b</sup> | ,170     | ,148              | 1,17582                    |

a. Predictors: (Constant), E&R

b. Predictors: (Constant), E&R; COM

**Table 36.** Coefficients<sup>a</sup> for Stepwise Regression II- Dependent Variable: LAND

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | 3,351                       | ,135       |                           | 24,795 | ,000 |
|       | E&R        | ,422                        | ,135       | ,333                      | 3,122  | ,003 |
| 2     | (Constant) | 3,356                       | ,131       |                           | 25,522 | ,000 |
|       | E&R        | ,423                        | ,131       | ,334                      | 3,215  | ,002 |
|       | COM        | ,309                        | ,133       | ,242                      | 2,330  | ,022 |

a. Dependent Variable: LAND

When Table 37 and Table 38 below are analyzed, it can be seen that the variance in industrial customers' service purchasing intentions is explained by three independent variables. The overall model has a strong explanatory power with 30% adjusted R square. 39% of the variance in service buying is explained by competitive advantage expectations, 38% of the variance is explained by efficiency and

responsiveness expectations and 19% of the variance is explained by cooperation and trust expectations. So H3a, H3b and H3c were supported.

**Table 37.** Model Summary for Stepwise Regression II- Dependent Variable: SERVICE

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | ,389 <sup>a</sup> | ,151     | ,140              | 1,06628                    |
| 2     | ,543 <sup>b</sup> | ,295     | ,277              | ,97802                     |
| 3     | ,575 <sup>c</sup> | ,330     | ,304              | ,95960                     |

a. Predictors: (Constant), COM

b. Predictors: (Constant), COM; E&R

c. Predictors: (Constant), COM; E&R; C&T

**Table 38.** Coefficients<sup>a</sup> for Stepwise Regression II- Dependent Variable: SERVICE

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | 3,644                       | ,119       |                           | 30,566 | ,000 |
|       | COM        | ,449                        | ,120       | ,389                      | 3,728  | ,000 |
| 2     | (Constant) | 3,645                       | ,109       |                           | 33,333 | ,000 |
|       | COM        | ,450                        | ,110       | ,390                      | 4,075  | ,000 |
|       | E&R        | ,434                        | ,109       | ,379                      | 3,964  | ,000 |
| 3     | (Constant) | 3,648                       | ,107       |                           | 33,998 | ,000 |
|       | COM        | ,454                        | ,108       | ,393                      | 4,188  | ,000 |
|       | E&R        | ,434                        | ,107       | ,380                      | 4,045  | ,000 |
|       | C&T        | ,216                        | ,108       | ,187                      | 1,996  | ,050 |

a. Dependent Variable: SERVICE

The last research model was related with the general investment intentions of the industrial customers in the logistics center. As per Table 39 and Table 40, this dependent variable is only related with the customers' expectations regarding the efficiency and responsiveness that they would derive from clustering in a logistics center. This result can be evaluated as a general investment decision is dependent on the expected cost efficiencies or the responsiveness opportunities. Although the adjusted R square value is rather low in the model and the predictive power is not very strong, the coefficients table state that H4b is supported. Approximately 29% of

the variance in the investment intention is explained by customers' expectations regarding efficiency and responsiveness.

**Table 39.** Model Summary for Stepwise Regression II- Dependent Variable: INVEST

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | ,289 <sup>a</sup> | ,083     | ,072              | 1,16452                    |

a. Predictors: (Constant), E&R

**Table 40.** Coefficients<sup>a</sup> for Stepwise Regression II- Dependent Variable: INVEST

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | 2,588                       | ,130       |                           | 19,879 | ,000 |
|       | E&R        | ,347                        | ,130       | ,289                      | 2,662  | ,009 |

a. Dependent Variable: INVEST

The regression analysis results showed the relationship between the customer expectations from clustering and the buying intention of potential customers from the logistics center. In addition to these independent variables, there was another section in the questionnaire that aimed to measure the OBB model of Webster and Wind (1972b) and the variables' relations with a final purchasing act. At this section, the question form was designed in a more figurative form so that the respondents could follow the relationship flows in the theoretical model. However, they were requested to respond in a 5-point Likert scale where they stated the influential power of the subject variable on their companies' final purchasing decision. The dependent variable in this section had a dichotomous nature. It had two response options which were yes or no to the decision point of buying land or service from a logistics center. Due to the dichotomous nature of the dependent variable, the relationship between the independent variables prevalent in the OBB model were explored through logistic regression analysis.

This analysis aims to identify the independent variables that impact group membership in the dependent variable (Hair et al., 2006). Here the dependent

variable is the final purchasing decision and if the respondent said “yes” to the final question it was coded as a “1” for the logistic regression. If the response was a “no” then it was coded with a “0” in the data set. This means that the final coefficient table will summarize the impact of significant independent variable(s) on the sample’s likelihood of making a final purchase from the logistics center.

As the forward stepwise logistic regression with the likelihood ratio principle was conducted, a base model was formed initially. According to the case processing summary, there were 9 missing values in the data set so the total sample of 72 responses were used for analysis. This base model was used in order to control if the new model predicts a better fit. The base model only predicts the constant and it was significant at 0.0001 level. After that six independent variables prevalent in the original OBB model were inserted in the analysis in a forward stepwise order. These variables were conditions in the macro environment (MACRO), conditions in the task environment (MICRO), the mediators of the task environment impacting the organization (MED), the organizational conditions (ORG), buying center’s interaction (BUYCEN) and the buying center member’s characteristics (IND). The hypothesis developed for logistic regression is H5: The independent variables of macro environment, task environment, mediators of the task environment, organizational conditions, buying center interaction and individual characteristics of the buying center increase or decrease the sample’s likelihood of making a final purchase from the logistics center.

When the new model was evaluated, it was seen that the difference between the null (base) model and two new models were significant at 0,0001 level. The final model was predicted in step 2 that contained two independent variables. The -2 Log Likelihood value of this second step was lower than the first step. A lower -2LL value indicated a better fit for the model so this second model was chosen. Also the Cox & Snell and Nagelkerke R Square values increased at the second step which is a predictor of a good model fit again (Table 41). The only problem regarding the model fit was about Hosmer & Lemeshow test which was found to be insignificant, but this test is highly sensitive to sample size and the sample size in this study is not very high which is accepted as a constraint. As the other two indicators show positive results for good model fit, the analysis was carried on.

**Table 41.** The Model Summary for Logistic Regression Analysis

| Step | -2 Log likelihood   | Cox & Snell R Square | Nagelkerke R Square |
|------|---------------------|----------------------|---------------------|
| 1    | 48,701 <sup>a</sup> | ,318                 | ,487                |
| 2    | 44,471 <sup>a</sup> | ,357                 | ,547                |

**Table 42.** Results of Hosmer and Lemeshow Test

| Step | Chi-square | df | Sig. |
|------|------------|----|------|
| 1    | 2,116      | 2  | ,347 |
| 2    | 9,468      | 8  | ,304 |

Following the model fit analysis, the classification accuracy was the next step to analyze. As the logistic regression method aims to predict group membership, the classification accuracy is an indicator for the predictive power of this model. Table 43 shows that there was a problem with the percentages correctly classified in the first step. Non-purchasers of logistics centers had a hit-ratio of 25% which is significantly below the threshold value of 65,5% (Hair et al., 2006). However, the second step of the model indicates better hit-ratios for both groups, therefore the second step is accepted as a better model that predicts group membership better than the base and the first models.

**Table 43.** Classification Table

|        |                    |      | Predicted            |      |                    |
|--------|--------------------|------|----------------------|------|--------------------|
|        |                    |      | PURDEC <sup>11</sup> |      | Percentage Correct |
|        |                    |      | ,00                  | 1,00 |                    |
| Step 1 | PURDEC             | ,00  | 4                    | 12   | 25,0               |
|        |                    | 1,00 | 1                    | 55   | 98,2               |
|        | Overall Percentage |      |                      |      | 81,9               |
| Step 2 | PURDEC             | ,00  | 10                   | 6    | 62,5               |
|        |                    | 1,00 | 3                    | 53   | 94,6               |
|        | Overall Percentage |      |                      |      | 87,5               |

After the hit-ratios were analyzed, the predictive power of the independent variables were to be analyzed. The coefficient table (Table 44) shows the variables in the logistic regression equation. The significance of the model coefficients are measured with the Wald statistic in logistic regression. For BUYCEN the Wald statistic is significant at 0,01 level and for MACRO the Wald statistic is significant at 0,10 level. The rest of the independent variables are listed on Table 45. They were excluded from the model because their score statistics were not significant anymore after the two significant variables were included in the model.

**Table 44.** Coefficients for Logistic Regression

|                     |          | B      | S.E.  | Wald   | df | Sig. | Exp(B) |
|---------------------|----------|--------|-------|--------|----|------|--------|
| Step 1 <sup>a</sup> | BUYCEN   | 2,268  | ,605  | 14,060 | 1  | ,000 | 9,658  |
|                     | Constant | -6,750 | 2,091 | 10,417 | 1  | ,001 | ,001   |
| Step 2 <sup>b</sup> | MACRO    | -1,270 | ,684  | 3,450  | 1  | ,063 | ,281   |
|                     | BUYCEN   | 3,261  | ,921  | 12,525 | 1  | ,000 | 26,073 |
|                     | Constant | -5,903 | 2,161 | 7,464  | 1  | ,006 | ,003   |

<sup>11</sup>PURDEC is the abbreviation for the dependent variable "Purchasing Decision".

**Table 45.** Variables not in the Equation

|        |                    |          | Score | df | Sig. |
|--------|--------------------|----------|-------|----|------|
| Step 1 | Variables          | MACRO    | 3,862 | 1  | ,049 |
|        |                    | MICROENV | ,323  | 1  | ,570 |
|        |                    | MED      | ,009  | 1  | ,924 |
|        |                    | ORG      | ,000  | 1  | ,991 |
|        |                    | IND      | ,256  | 1  | ,613 |
|        | Overall Statistics |          | 6,748 | 5  | ,240 |
| Step 2 | Variables          | MICRO    | 1,829 | 1  | ,176 |
|        |                    | MED      | ,558  | 1  | ,455 |
|        |                    | ORG      | ,300  | 1  | ,584 |
|        |                    | IND      | ,399  | 1  | ,528 |
|        | Overall Statistics |          | 2,372 | 4  | ,668 |

In a logistic regression analysis, the signs of the original coefficients indicate the direction of the relationship between the dependent variable and the independent variables. If the original coefficients are positive then the relationship is predicted to be positive. The exponentiated coefficients are a transformation of the original logistic coefficients and if they are higher than 1, then the relationship is said to be positive. If they are lower than 1, then the relationship between the independent and dependent variables is said to be negative (Hair et al., 2006).

The analysis results show that, the relationship between the macro environmental components and the purchasing decision is negative. Therefore, as values for MACRO increase the predicted probability that a 3PL/4PL will be categorized as a purchaser of logistics center land or services will decrease. On the other hand, the relationship between buying center interaction and the purchasing decision is positive which means that as the interaction in the buying center increases, the predicted probability that a 3PL/4PL will be categorized as a purchaser of logistics center land or services will increase.

There were some limitations regarding the logistic regression analysis due to the low sample size. For the external validity of this analysis, the overall sample has to be divided into two groups which are the analysis sample and the holdout sample. However, this procedure would result in statistically insignificant results because of the low sample size. According to Hair et al. (2006) an efficient sample size for

logistic regression analysis is over 400 observations however it was not possible to collect 400 responses in this research case.

The summary of the regression analysis results are exhibited on Table 46

**Table 46** Summary of Regression Analysis

| <b>Regression Analysis</b>                                                                    | <b>Hypotheses</b> | <b>Support or Reject</b> | <b>Beta</b>              |
|-----------------------------------------------------------------------------------------------|-------------------|--------------------------|--------------------------|
| Stepwise Regression 1<br>Customer Expectation Factors &<br>Overall Buying Tendency            | H1a               | Support                  | 0,262                    |
|                                                                                               | H1b               | Support                  | 0,390                    |
|                                                                                               | H1c               | Support                  | 0,211                    |
|                                                                                               | H1d               | Reject                   | NONE                     |
| Stepwise Regression 2 Dependent<br>Variable: LAND                                             | H2a               | Support                  | 0,242                    |
|                                                                                               | H2b               | Support                  | 0,334                    |
|                                                                                               | H2c               | Reject                   | NONE                     |
|                                                                                               | H2d               | Reject                   | NONE                     |
| Stepwise Regression 2 Dependent<br>Variable: SERVICE                                          | H3a               | Support                  | 0,393                    |
|                                                                                               | H3b               | Support                  | 0,380                    |
|                                                                                               | H3c               | Support                  | 0,187                    |
|                                                                                               | H3d               | Reject                   | NONE                     |
| Stepwise Regression 2 Dependent<br>Variable: INVEST                                           | H4a               | Reject                   | NONE                     |
|                                                                                               | H4b               | Support                  | 0,289                    |
|                                                                                               | H4c               | Reject                   | NONE                     |
|                                                                                               | H4d               | Reject                   | NONE                     |
| Logistic Regression<br>(The impact of MACRO, MICRO,<br>MED, ORG, BUYCEN and IND<br>on PURDEC) | H5                | Only two are significant |                          |
|                                                                                               |                   | MACRO                    | 0,281 (Negative Impact)  |
|                                                                                               |                   | BUYCEN                   | 26,073 (Positive Impact) |

#### **4.2.2. Fuzzy QFD Analysis**

##### **4.2.2.1. New Service Development Process**

New service development (NSD) process has different characteristics when compared with tangible products development (Lee and Chen, 2009). The perceived differences between services and goods are already explored in Section II. These differentiating properties facilitate special attributes that should be undertaken during NSD processes. However, there is a strong ratio of NSD failures due to inefficient development processes (de Brentani, 1995) and lack of customer involvement in the process (Martin and Horne, 1993). As already underlined by the theoretical framework, in this study, customer involvement for NSD process is essential due to the relationship marketing orientation, combined with industrial network approach

and service dominant logic. Consequently, the potential customers of the industrial services that will be provided by a logistics center, should be involved in the service development process.

Together with the rise of services in the new economy, NSD has become an important issue for researchers and marketing practitioners. Despite the vast amount of research that focuses on new product development (NPD), NSD has only attracted attention after 1983 in the USA and UK (Cowell, 1988). It is very important for companies to adopt effective NSD processes as they directly influence the success of the service product (Cooper et al., 1994; Cooper and de Brentani, 1991) and also the overall performance of the organization. However, many service organizations do not have formal and well-operating NSD processes (Fitzsimmons and Fitzsimmons, 2000) and they still use trial-failure methods in launching new service products (de Brentani, 1989).

Majority of the failures in NSD processes result due to ill defined concepts, lack of concept evaluation, insufficient concept testing, inadequate market knowledge and other similar factors (Froehle and Roth, 2007). Lack of quality focus in the development process is also another important problem that results in service failures after launch (Edvardsson, 1992). In order to eliminate this problem, it is required to develop the new service depending on the customer perceptions related with the added value of the specific service offering (Edvardsson and Olsson, 1996).

The new services provided by an organization may be either core services which directly offer added value to customers or peripheral services that support or improve a core service (Carman and Langeard, 1980). Another classification effort is done upon facility-target market perspective where a new service is defined to be multisite if new sites are introduced in order to provide the same service to the same customer segment; multisegment if the existing site and service is used to attract new customer segments; or multiservice if new services are added to the existing site for the existing customer base (Carman and Langeard, 1980). The service development effort in this study is, however, different from all these classifications. It is a totally new service located in a new site that carries public and private properties. The services of a logistics center may be defined as peripheral for the residents' main logistics services that they provide for second tier customers. In the end, the logistics

center is an organization that facilitates the better execution of these services in a defined area. Within this framework, the introduction of a logistics center is between “start-up businesses” and “major innovations” classification of Lovelock (1984) on services. The logistics services needs of logistics companies or logistics related industries are already fulfilled by distinct organizations. However, combining all of them at a single point and providing a one-stop-shop service is an innovation for this industrial service market.

The literature in NSD is mainly focused on identifying the process steps that should be followed for successful results. Majority of these efforts are linear models that divide the NSD process into independent and sequential stages. Shostack (1984) introduces ten different steps for the development of a discount brokerage service and groups these steps under three main levels where definition, formal description and testing and market launch takes place. Reidenbach and Moak (1986) develop a six-stage model that includes idea generation/evaluation, concept development and testing, economic analysis, product testing, market testing and commercialization steps. Voss et al. (1992) shorten the stages under four steps which are concept development and analysis, prototype service development, prototype service test and debug and full launch of new service. Johnne and Storey (1998) state that majority of NSD process steps are generated from Booz et al.’s (1982) new product development process steps which are composed of new product strategy, idea generation, screening and evaluation, business analysis, development, testing and commercialization. However, screening and testing stages are generally skipped in NSD processes (Davison et al., 1989) and even the other steps are carried out they are handled less proficiently in the development of new services (Edgett, 1996). A unification of NSD process literature has been carried out by Johnson et al. (2000) whom summarized all the steps under four main stages of design, analysis, development and full launch. The difference of this model is its non-linear cyclic nature where the NSD process is seen as an iterative and continuous process that keeps evolving (Tsai et al., 2008).

Although the stages in NSD and NPD processes do not vary that much, there are certain other differences between these two concepts. Griffin (1997) states that the time spent in NSD processes are nearly 50 % shorter than NPD processes. In

NSD processes the customer is an integral party which is different from general NPD processes. Customer specifications are essential inputs for NSD processes. The heterogeneity of customer outputs causes difficulties in NSD processes which make it hard to experiment a service delivery process as it will give different outcomes depending on the customers that are consuming it (Tsai et al., 2008). So services should be evaluated from a different point when compared with physical goods during the development processes.

One other perspective in developing new services is the adoption of resource-oriented practices. This perspective deals with the acquisition and organization of company resources like people, knowledge, infrastructure and other tangible and intangible assets. Froehle and Roth (2007) state that companies execute certain practices related with three major types of resources which are intellectual resources, organizational resources and physical resources. The resources are important inputs that a company can utilize during NSD processes. Also certain service characteristics like heterogeneity and perishability plus market orientation have positive impacts on innovation resources of service companies (Jaw et al., 2010). These innovation resources in return increase the NSD performance (Jaw et al., 2010).

To summarize, NSD is a different process when compared with the development of new physical products. Even though it follows similar stages with NPD, the practices employed are different due to the characteristics of services. In this study, the NSD process is applied to an industrial service which is not currently offered in the related business market. The service producing entity, the logistics center, is to be newly established in the research area. However, the idea and the logistics center concept is not totally unfamiliar to prospective industrial customers due to the European examples that have been explored in sectoral publications and by policy makers. However, the main idea in this research defends that the industrial service that will be produced by a logistics center in Turkey would require country-specific design. It is not feasible to imitate the existing European or American examples as the infrastructure conditions, customs procedures, logistics industry and industrial customers in Turkey are completely different. Thus, the study adopts a customer-oriented process to concept development stage of NSD process.

According to Edvardsson (1997) the service concept has to specify both the primary and secondary needs of the customer and develop core and support services accordingly. The service concept is developed for satisfying the needs, wishes and expectations of customers whom are the co-producers in a “service factory”. The customers perform certain activities in the overall service process in which the employees, computers or machinery also perform other activities. So in order to create favorable customer outcomes, it is important to explore the ideas, suggestions and behavior of customers and taking the customer perspective into account when building up services (Edvardsson and Olsson, 1996). This would solve the problem of excess and unnecessary public investment in a logistics center and align the service with market demand so as to develop a marketable facility.

A method that takes the voice of customer into account when developing new products or services is Quality Function Deployment (QFD). It is a favorable tool that translates customer requirements into the technical capabilities of a certain market offering. In order to involve the potential industrial customers of a logistics center to be established in Turkey, QFD is adopted in this research. The next section explores the QFD methodology and defines the research process that is followed in this study.

#### **4.2.2.2. Quality Function Deployment**

QFD as a systematic tool for quality design and development has been initially applied in Kobe Shipyards in the form of Quality Tables by Yogi Akao in 1972 (Govers, 1996). In the USA, Xerox was the first company to use QFD in 1984 which was followed by companies like Ford, General Motors, Digital Equipment, Hewlett-Packard, AT&T and ITT (Prasad, 1998). After its spread to the USA in 1980s and to a variety of different industries, a large amount of literature on QFD has been developed (Chan and Wu, 2002). Extensive literature reviews on QFD are performed by Carnevali and Miguel (2008), Sharma et al. (2008) and Chan and Wu (2002) where the amount of publications, the industrial applications, the difficulties that can be faced during implication processes, the historical development, the different application objectives are all covered.

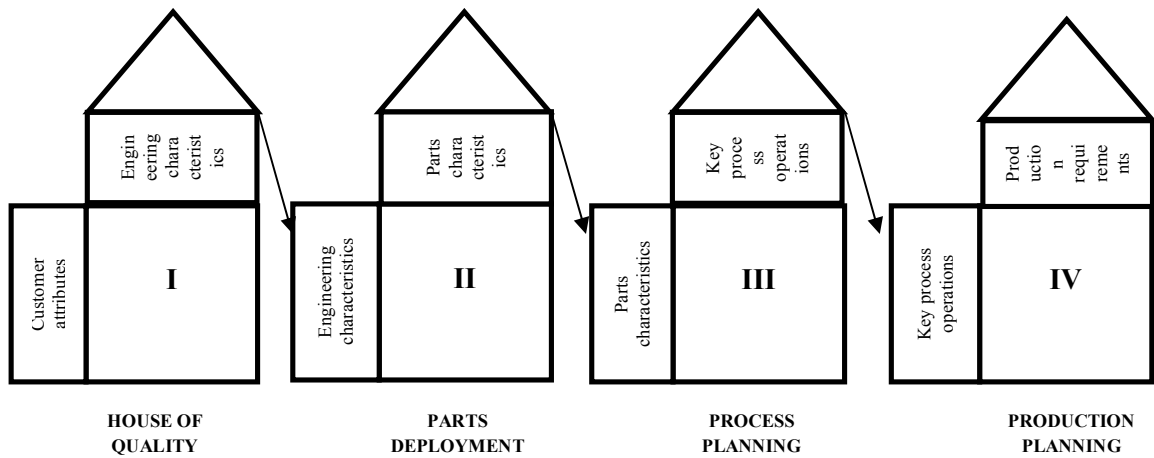
In Turkey, the method was firstly adopted by Arçelik which is a pioneer company in quality management processes. It is now used in automotive and spare parts, air transportation, train car production, satellites and communication devices, power systems, computers, decision support systems, software development, food, medical tools industries. Additionally, service industries like banking, hospitality, library, mortgage, education and supply chain management also adopt QFD as a product or service development approach (Başkır, 2011).

QFD was developed with two main objectives: (1) to convert customer requirements or expectations into product quality characteristics during the design phase and (2) to deploy these quality characteristics into production activities and manufacturing operations so that the critical control points are set up before production starts and they are designed depending on the customer wishes (ReVelle et al., 1998). In the application examples of QFD, it is observed that the problems encountered in product development stages and the overall product development time have been decreased by one half to one third while the customer satisfaction and sales increased (Akao, 1990).

Quality function deployment is defined by Akao (1990: 5) as *converting the consumers' demands into quality characteristics and developing a design quality for the finished product by systematically deploying the relationships between the demands and the characteristics, starting with the quality of each functional component and extending the deployment to the quality of each part and process. The overall quality of the product will be formed through this network of relationships*. In order to achieve this aim, a tool called the House of Quality (HoQ) is developed and used in a sequence from upstream planning phase to downstream production phase.

QFD defines four main phases for a product development process that takes customer requirements into considerations. These phases are (1) strategy and concept definition, (2) product design, (3) process design and (4) manufacturing operations (Govers, 1996). These phases are schematized through four linked houses that start with the HoQ (Hauser and Clausing, 1988). Figure 30 shows these four houses following the four stages of product development.

**Figure 30.** Linked Houses of QFD



Source: Hauser and Clausing, 1988: 73.

Out of these four steps, the first step which is called the HoQ, is the most essential step as it is used to define the right product concept for the target customer(s). The greatest advantage is derived from this tool when the voice of the customer is collected in accordance with reality and deployed into the manufacturing steps in an effective manner (Govers, 1996). Although there are various extended versions of classic HoQ methodology (e.g. Prasad, 1998), the main framework of this tool is composed of voice of the customer (WHATs), voice of the technician (HOWs) and their relationships (Chan and Wu, 2005).

Hauser and Clausing (1988) asks a series of questions with an effort to systematize the building process of HoQ. These start with *What do Customers Want?* This part tries to explore the customer attributes of a specific product or service. Here some important points are to select the product or product characteristics that the study wants to focus, select the target customers whose product attributes or requirements are considered to be important and which products or services are the primary competitors of the studied product or service (Govers, 1996). Comment cards, customer questionnaires, focus groups, toll-free telephone lines, customer visits, web site feedback sections and employee feedback are among various tools that can be used to collect customer requirements (Besterfield et al., 2003).

The second question to ask is *Are all preferences equally important?* (Hauser and Clausing, 1988). Some of the customer attributes are perceived to be more important than others. So it is essential to explore the relative importance of these

requirements from the customers' points of view. The third question is *Will delivering perceived needs yield competitive advantage?* (Hauser and Clausing, 1988). At this part it is essential to specify the immediate competitors of the explored product or service and assess customer evaluations of the studied product or service against the competitors in terms of the given customer attributes or requirements.

The next question to ask is *How can we change the product?* (Hauser and Clausing, 1988). Up till here the questions are related with the marketing domain of the study. Now the answer to this question is related with the engineering domain and explores the engineering characteristics that are required to satisfy customer requirements. These characteristics should describe the product in mesurable terms and should be directly related with customer perceptions. The next question answers the matrix part of HoQ: *How much do engineers influence customer-perceived qualities?* (Hauser and Clausing, 1988). At this stage the relationships between the customer attributes and the engineering characteristics are explored by the QFD team. The question that builds up the roof is *How does one engineering change affect other characteristics?* (Hauser and Clausing, 1988). Sometimes one engineering characteristic may be impossible to perform as it has totally negative impact on other characteristics. Some of them are, on the other hand, may be positively correlated with other characteristics. It is essential to visualize this methodology as well. The answers to all these questions formulize the framework for HoQ (Figure 31).

The explanations of the areas represented on Figure 31 are as follows (Başkı, 2011) :

1- The customer components on HoQ

(A): The product requirements, expectations or attributes specified by the customers

(B): The importance ratings for the WHATs, that represent the prioritization of customer expectations.

(D): The relationship matrix between the customer expectations and product characteristics.

(F): The competitive assessment part where the company's product is compared with competitors' products by the customer.

2- The technical components on HoQ

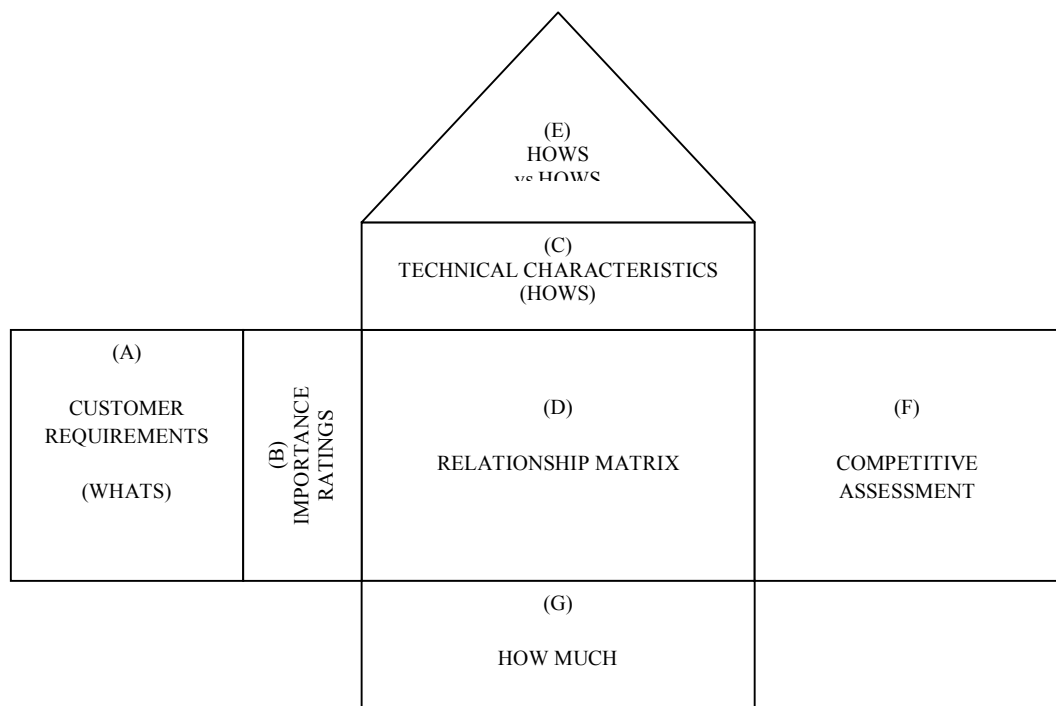
(C): Product, technical or engineering characteristics that are required to satisfy customer expectations.

(E): The roof that shows the correlations among the product characteristics

(D): The relationship matrix between the customer expectations and product characteristics.

(F): The prioritization part that lets a comparison between the company's product and competitors' regarding the technical characteristics and calculates the target values.

**Figure 31.** House of Quality



Source: Başkır, 2011: 11

In order to systematize HoQ building process, Chan and Wu (2005) propose a 9-step model where they omit certain steps in order to assure ease of use. The model of Chan and Wu (2005) is applied for a fried Chinese vegetable so the application example is for a physical product. However the very same model is suggested as an applicable tool for the design and improvement of private health services in India by Rahman and Qureshi (2008). As the object of study in this research is an industrial

service that will be provided by a logistics center to be established, a service perspective to QFD is required.

Bottani and Rizzi (2006) state that adoption of QFD in service assessment is a less developed area in the related literature. According to their review, there are efforts to improve services through QFD by deploying customer complaints as WHATs in HoQ (Lapidus and Schibrowsky, 1994); to match customer requirements with general service management areas (Behara and Chase, 1993) and propose QFD as a useful tool for service design and planning service processes, without a real life application though (Kim and Meiren, 2010; Stuart and Tax, 1996). Chan and Wu (2002) explore a detailed list of literature that adopts QFD as a tool for the design and development of quality services in the fields like banking (Ko and Lee, 2000), professional services (Adiano, 1998), hotels (Dube et al., 1999), retail (Nagendra and Osborne, 2000) and many more (pls. see Chan and Wu, 2002 for a detailed list).

Despite this longer list of QFD adoption in services, its application in logistics field is already rare (Bottani and Rizzi, 2006). Lin and Pekkarinen (2011), Baki et al. (2009), Sakao et al. (2003) are among the few studies that apply QFD to the logistics services field. Table A1 shows a detailed list of existing studies that use QFD methodology for different logistics problems. Bottani and Rizzi (2006) have adopted a fuzzy approach to QFD and applied it in a proactive manner to design strategic logistics service. In that study they revised the QFD steps according to their research objectives as it was a proactive effort. Due to the specific objectives and nature of this study, the adopted QFD steps are different than the cited applications and they will be explained in detail at the data collection and analysis section of QFD. Prior to that stage, the methodological steps of the triangulated research in this study are explained sequentially and the findings are summarized at the conclusion part.

#### **4.2.2.3. Population and Sampling of the Fuzzy QFD Process**

The population of this quantitative research step was specified as the respondents of the survey research step. They were selected as a representative sample of the Turkish logistics industry and as the QFD process was designed with a

market orientation, they would be the best QFD team in order to decide the relationships between customer requirements and the technical characteristics of a logistics center. However, due to the infeasibility of applying the QFD study to the whole population, a representative sample out of them was chosen as the QFD team. 7 3PLs that operate in the field of all logistics services that were listed on Table 22 were selected and 1 port operator was added in order to cover the whole services cluster that was composed in the survey research step.

3 of these participants were contacted face to face and they completed the QFD matrices during a short informal interview. The other 5 participants received the matrices through their e-mails with an explanatory text and they returned the filled up electronic forms within one week.

#### **4.2.2.4. Data Collection Process for Fuzzy QFD**

The data collection process for fuzzy QFD analysis was designed inline with the QFD steps of Chan and Wu (2002) and Bottani and Rizzi (2006). However they were slightly changed according to the aims of this study and the nature of the research unit which is a logistics center that is not operating yet.

**Step 1- Identify customers and collect customer needs:** In this study, the aim is to propose the prioritized areas for the industrial service that will be provided by a logistics center in Turkey. The logistics centers are industrial clusters where logistics related companies are geographically concentrated with certain objectives. These objectives explain the expectations of these individual companies in locating together at a certain destination. For a logistics center to be successful, it needs to match the service inside according to these expectations. Such a design would attract potential customers to the facility. So the customer requirements or WHATs in this study are specified as the customer expectations from a logistics cluster.

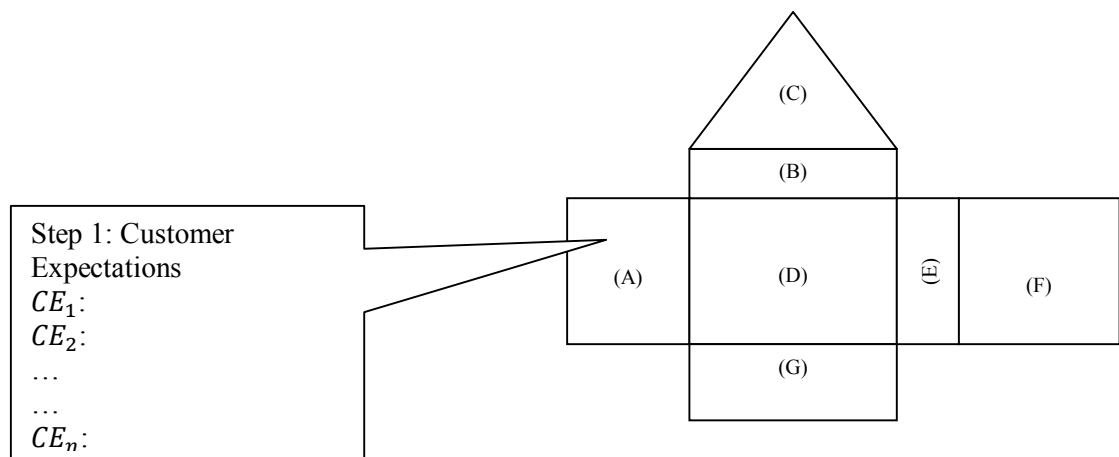
Collecting the customer requirements is a qualitative research task as it carries an exploratory character. In this study, the customer expectations from a logistics center were derived from the literature review on logistics center determinants. This part of the literature mainly focuses on the advantages of

investing in a logistics center, the rationale behind clustering. This literature was integrated with cluster theory approaches and the items were derived accordingly.

The customers for this study are the industrial customers of a potential logistics center. Although there are many different potential customers that would operate in a future logistics center, the target customers are the 3PLs whose existence would facilitate the existence of other related companies in a logistics center. 3PLs are industrial service buyers from a logistics center that provides real estate, support services or infrastructure for the performance of logistics services. So the industrial customers whom will rank these customer expectations were chosen as the 3PLs in the research setting.

As the customer expectation list was derived from the literature by the author, it required a customer refinement or modification so as to convert it to real “voice of customer”. This process was handled through a survey application among the 3PLs who have a potential to buy services from a future logistics center. New items were added, current items were refined throughout this process. The factor analysis results which are listed in Table 29 were used as the inputs to this step. The representation of Step 1 is shown on Figure 32.

**Figure 32.** Step 1- Specification of Customer Expectations (WHATs)



**Step 2- Generate technical measures:** In this study, instead of specifying some engineering characteristics, the service characteristics were determined which would satisfy or facilitate the customer expectations. In order to specify the service characteristics four different methods were used. One to one interviews were held

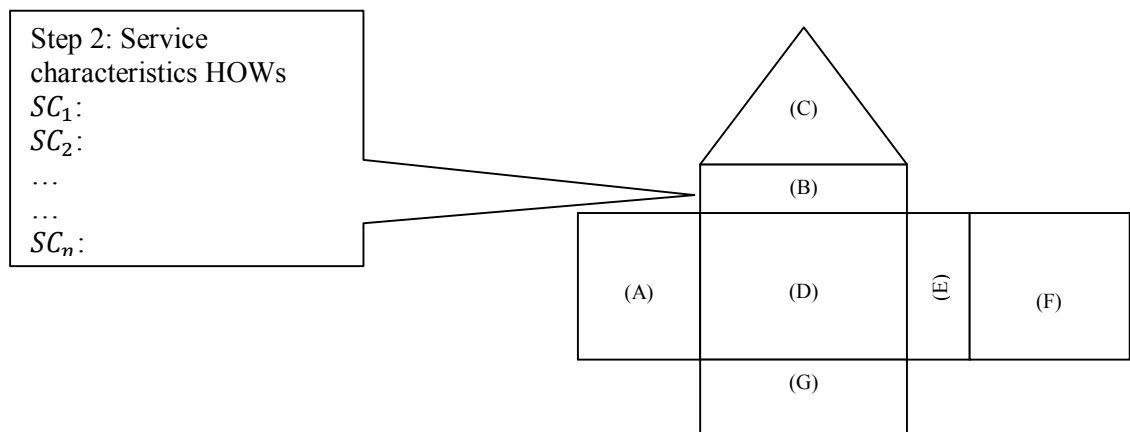
with two successful examples of logistics center facilities in Europe. The managers of these facilities stated the service characteristics that they offer to their industrial customers.

After that, a focus group session was held with potential users of such a facility in Turkey, Izmir and their suggestions related with the service characteristics of a logistics center were derived through a qualitative analysis. Griffin and Hauser (1993) state that collecting customer requirements through one-to-one interviews is much more cost effective when compared with focus groups but, their study took a complex office equipment as the research object which was a physical product. In this study, the concept is an industrial service which is hard to evaluate so multiple perspectives were required for reaching common evaluations.

A content analysis study followed this step which was applied on the published industrial journals in the field of logistics and the majority of the service characteristics that were mentioned in these resources were analyzed. In order to validate these results a second wave of one-to-one interviews were held with the representatives of the logistics associations that published these journals. The results were compared with each other.

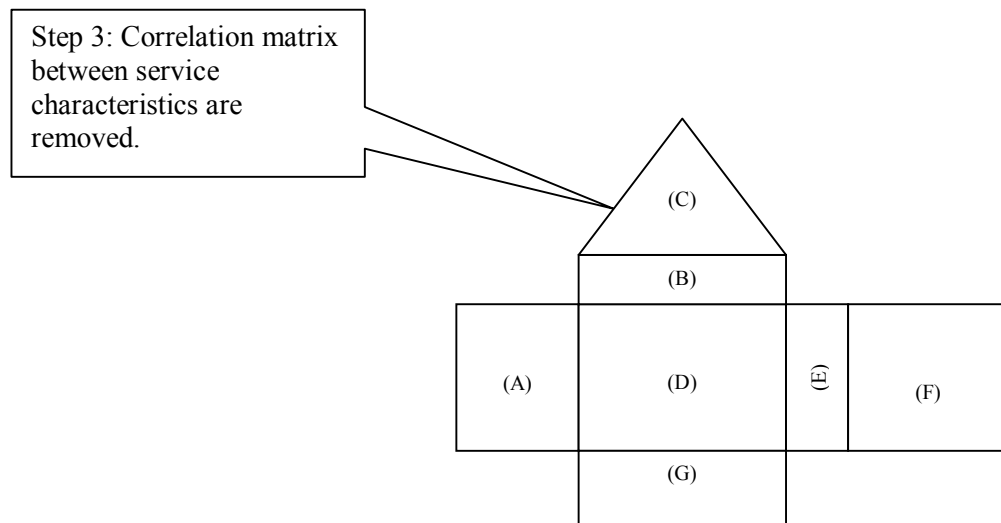
Finally the collected data was combined with the literature review so that the list of service characteristics was finalized. In order to group the long list of service characteristics under certain factors, these were also asked to the 3PL sample during the survey research step and the list was refined to several factors. This process is represented on Figure 33.

**Figure 33.** Step 2-Generation of Technical Measures (HOWs)



**Step 3- Determine the correlations between service characteristics:** This step is not available on Chan and Wu's (2005) methodology but it is adopted in Bottani and Rizzi's (2006) study. It is essential to visualize if there is a positive or negative relationship between two engineering characteristics in order to forecast future application difficulties. However, in the current study, the service characteristics are composed of the existing facilities or utilities in logistics centers. They are found altogether in successful examples so a negative correlation was not expected between them. The possible positive relationships were eliminated at this step as a fully functioning logistics center is not operating yet in Turkey and it would be healthier to evaluate such relations after using or managing such a facility first. Therefore the roof of HoQ was removed from the process as shown on Figure 34.

**Figure 34.** Step 3-Determination of Correlations between WHATs and HOWs



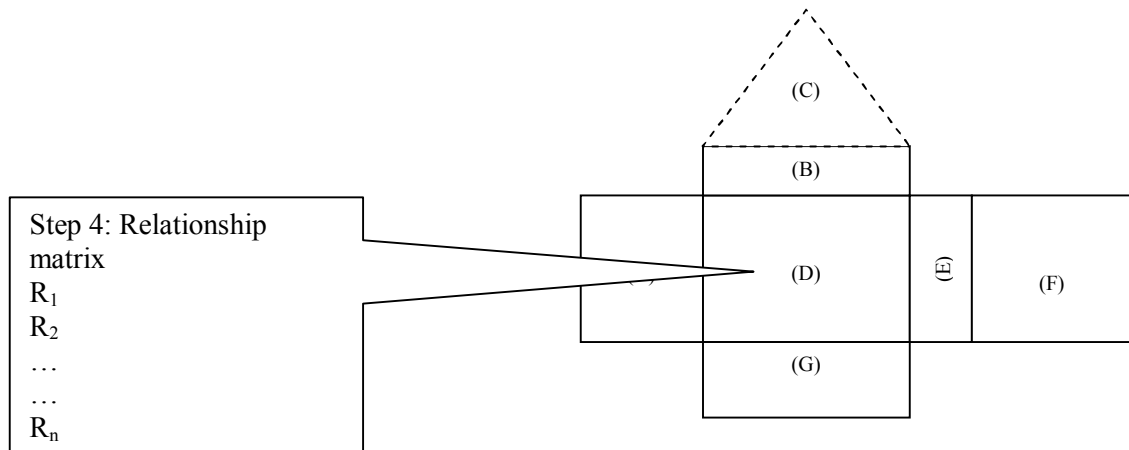
**Step 4-Determine relationships between WHATs and HOWs:** At this step, the relationships between the customer expectations and the service characteristics were determined by a representative sample of the survey respondents. Out of the 81 respondents of the survey, 8 3PLs were selected (10%) according to the coverage of their services as explained in the population and sampling section for QFD analysis. They were requested to evaluate the strength of the relationships between specific customer expectations and service characteristics depending on the below given linguistic scale (Table 47) which was also used in Bottani and Rizzi's (2006) study.

Each linguistic response corresponded to a triangular fuzzy number. Step 4 is represented by Figure 35.

**Table 47.** Linguistic Scale I

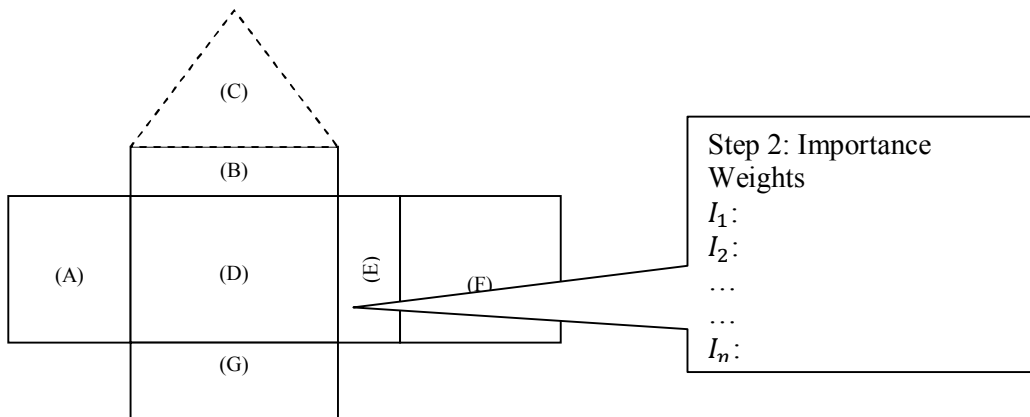
| Degree of Relationship | Linguistic Symbol | Fuzzy Number  |
|------------------------|-------------------|---------------|
| Strong                 | S                 | (0,7;1;1)     |
| Medium                 | M                 | (0,3;0,5;0,7) |
| Weak                   | W                 | (0;0;0,3)     |

**Figure 35.** Step 4-Determination of Relationship Matrix



**Step 5-Determine importance ratings of WHATs:**The QFD team was requested to evaluate the customer expectations dimensions according to their perceived importance values. Not every expectation could be equally important for every customer so every QFD team member evaluated each customer expectation's importance degree according to the company that he/she was working for. This session contributes as an input for area (E) on Figure 36.

**Figure 36.** Step 5-Determination of Importance Ratings

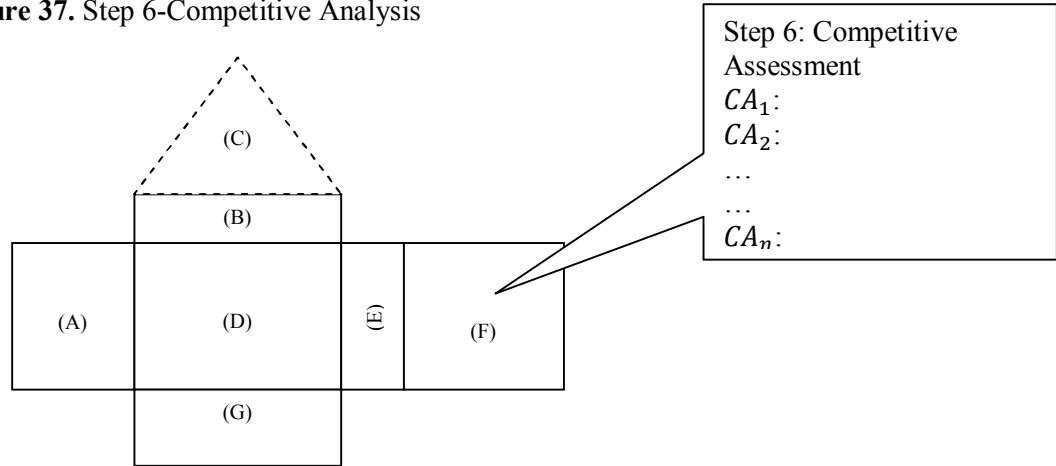


**Step 6-Identify competitors, conduct customer competitive analysis and set customer performance goals for WHATs:** In conventional QFD applications, no matter if the object of research is a product or a service, the closest competitors are easily specified and the customers are requested to assess the company's market offering in comparison with the given competitors'. However, in this study there are no existing competitors for the logistics center to be established. The service design effort is done for a facility which is not available at the moment in the market. In the strategic logistics service example, this competitive analysis part is converted into a performance assessment part where the customers evaluated the existing performance of the company in terms of given service factors (WHATs) and stated the superior performance that the company should have been delivering to achieve customer satisfaction (Bottani and Rizzi, 2006). In this study, this version is not adoptable as well because there is no existing facility that is currently delivering this market offering so performance evaluation is not able to be done.

Although there are no competitors at the moment for a logistics center to be established in Turkey, the individual private facilities that the 3PLs establish, hire or lease themselves in order to ease their logistics operations could be considered as the biggest rivals. This was also mentioned during the focus group study by one of the participants. Therefore, in this study the competitive assessment part on HoQ was evaluated through the comparison of a logistics center with an individual logistics facility in terms of customer expectations. The QFD team was requested to evaluate

the ability of the logistics center to fulfill a specific customer expectation and the ability of private facilities outside the logistics center to fulfill the same customer expectation. This step is represented on Figure 37.

**Figure 37.** Step 6-Competitive Analysis



For evaluating the importance values of customer expectations, the abilities of the logistics center and the individual facilities, the scale was used which is given on Table 48. This scale was also adopted from Bottani and Rizzi (2006).

**Table 48.** Linguistic Scale II

| Judgments | Linguistic Symbol | Fuzzy Number |
|-----------|-------------------|--------------|
| Very High | VH                | (0,7;1;1)    |
| High      | H                 | (0,5;0,7;1)  |
| Low       | L                 | (0;0,3;0,5)  |
| Very Low  | VL                | (0;0;0,3)    |

**Step 7-Determine final importance ratings of WHATs:** At this step the final importance ratings of WHATs were calculated. In order to calculate these final importance ratings the method that is adopted by Bottani and Rizzi (2006) was used. First the distance values between the performances of the two alternatives, which were the logistics center and the individual logistics facility were calculated with Equation 1.

$$\text{(Equation 1)} \quad d(\mu_A(X), \mu_B(X)) = \int_X |\mu_A(x) - \mu_B(x)| dx,$$

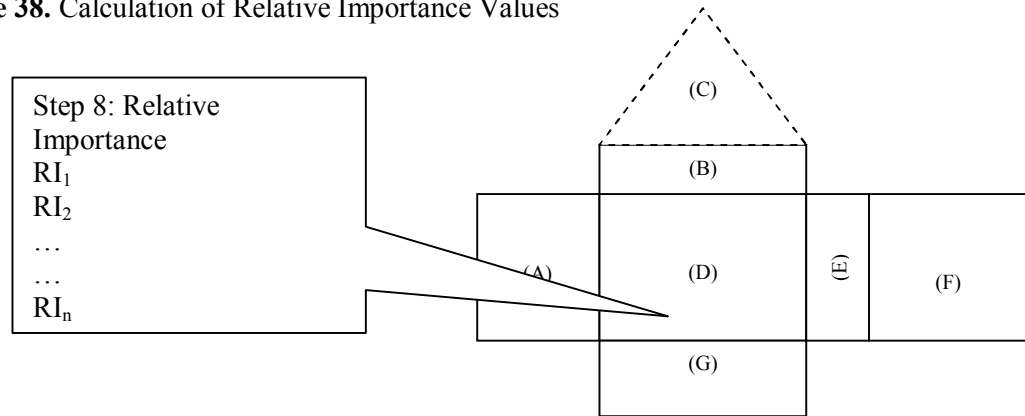
After that the final importance ratings of WHATs were calculated with the help of Equation 2 where the distances were multiplied with initial importance ratings. These were named as weighted importance degrees.

$$\text{(Equation 2)} \quad W_i^* = d_i \otimes W_i, i=1, \dots, n$$

Step 8, 9 and 10 are quite different from Chan and Wu's (2005) methodology but similar with Bottani and Rizzi's (2006) study. As a logistics center to be established in Turkey is a new project, it is essential to calculate the marginal utility that will be derived from delivering each of the service characteristics. The aim is to prioritize the service characteristics in accordance with the customer expectations from such a cluster so the terms such as cost of application and the marginal utility were introduced to the QFD process.

**Step 8-Calculate the relative importance of service characteristics:** At this step the relative importance of service characteristics were calculated by multiplying the relationship matrix values and the weighted importance degrees. This step helps to represent the importance of each service factor and this is where the customer expectations are translated into service design characteristics. The process is visualized on Figure 38.

**Figure 38.** Calculation of Relative Importance Values



**Step 9 and Step 10-Calculate the marginal utility that will be derived from each service characteristic:** At these steps first the cost of realizing each service factor was evaluated by two additional QFD team members. These two members were selected on purpose as they had experience in Turkey's few initiatives in terms of logistics clusters and they were still running projects for establishing logistics centers by the private sector. Their responses represented a consensus in terms of the amount of the investment required to establish each service characteristic. The collected responses were again linguistic judgments instead of real numbers and they were collected according to the scale given on Table 48. After that, in order to calculate the marginal utility that will be derived through delivering each of the service characteristics was calculated using Equation 3

$$\text{(Equation 3)} \quad U_j = RI_j \otimes \frac{1}{c_j}, j=1, \dots, m$$

$U_j$ : Marginal utility of the  $j$ th service characteristic

$c_j$ : Cost of investment for  $j$ th service characteristic

The utility numbers were again triangular fuzzy numbers and they were required to be defuzzified for a final analysis. Equation 6 was used for defuzzification and the results were evaluated accordingly.

Before starting the data collection process, a QFD matrix had to be prepared for the systematic research and analysis of the collected data. As already explained, this matrix, which is called the House of Quality (HoQ) used the factor analysis outputs of the survey research as inputs to its specific parts. The factors derived from the second part of survey research were used as the WHATs of the HoQ. The factors derived from the third part of survey research were used as the HOWs of the HoQ.

The QFD steps that were explained above were used in the formulation of the HoQ and the total matrix was divided into two different sections which were asked to the respondents in the form of two different questions. They are listed on Table 49 and Table 50.

**Table 49. HoQ Matrice I**

|                                              |                                                                                                                                                      | TECHNICAL CHARACTERISTICS IN A FREIGHT VILLAGE                                                         |                                                                                                                                          |                                                                                                                                 |                                                                                                      |                                                                    |                                                                                                                                                        |                                                                                                                         |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                                              |                                                                                                                                                      | Supporting Infrastructure (Call Center, Hotels, Restaurants, Library, University units, Chambers etc.) | Basic Infrastructure (Land-rail integration, seport connection, customs offices, energu and information technology infrastructure etc. ) | Warehousing and Intermodal (Intermodal terminal, standard warehouses, bonded warehouses, open warehouses, container yards etc.) | Secondary Supporters (Oil stations, TIR parks, working offices, post office, security offices, etc.) | Special Warehousing (Cold Storage, Tanks, Bulk Cargo Storage etc.) | Value-added Services (Marketing services, Consulting and problem solving services, packaging, labeling and other VALS, one-stop-shopping services etc) | Standard Services (Maintenance and Repair services, safety and security services, information technology services etc.) |
| CUSTOMER EXPECTATIONS FROM A FREIGHT VILLAGE | Competitive Advantage (ability to influence the environment, proximity to resources, proximity to vendor source, sybergy, innovation abilities etc.) | 1. <input type="text"/>                                                                                | 2. <input type="text"/>                                                                                                                  | 3. <input type="text"/>                                                                                                         | 4. <input type="text"/>                                                                              | 5. <input type="text"/>                                            | 6. <input type="text"/>                                                                                                                                | 7. <input type="text"/>                                                                                                 |
|                                              | Efficiency and Responsiveness (improvement of services, facilitation of intermodal transportation, decreasing logistics costs)                       | 8. <input type="text"/>                                                                                | 9. <input type="text"/>                                                                                                                  | 10. <input type="text"/>                                                                                                        | 11. <input type="text"/>                                                                             | 12. <input type="text"/>                                           | 13. <input type="text"/>                                                                                                                               | 14. <input type="text"/>                                                                                                |
|                                              | Cooperation and Trust (increased information sharing, trust and cooperation among resident companies)                                                | 15. <input type="text"/>                                                                               | 16. <input type="text"/>                                                                                                                 | 17. <input type="text"/>                                                                                                        | 18. <input type="text"/>                                                                             | 19. <input type="text"/>                                           | 20. <input type="text"/>                                                                                                                               | 21. <input type="text"/>                                                                                                |
|                                              | Sustainability (economic, social and environmental sustainability)                                                                                   | 22. <input type="text"/>                                                                               | 23. <input type="text"/>                                                                                                                 | 24. <input type="text"/>                                                                                                        | 25. <input type="text"/>                                                                             | 26. <input type="text"/>                                           | 27. <input type="text"/>                                                                                                                               | 28. <input type="text"/>                                                                                                |

**Table 50. HoQ Matrice II**

|                                                                                                                                                      | 1. DEGREE OF IMPORTANCE                            | 2. THE PROBABILITY THAT FREIGHT VILLAGE MEETS THESE EXPECTATIONS | 3. THE PROBABILITY THAT 3PLS' OWN FACILITIES (OUTSIDE THE FREIGHT VILLAGE) MEET THESE EXPECTATIONS |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| CUSTOMER EXPECTATIONS                                                                                                                                | VH: Very High<br>H: High<br>L: Low<br>VL: Very Low | VH: Very High<br>H: High<br>L: Low<br>VL: Very Low               | VH: Very High<br>H: High<br>L: Low<br>VL: Very Low                                                 |
| Competitive Advantage (ability to influence the environment, proximity to resources, proximity to vendor source, sybergy, innovation abilities etc.) | <input type="text"/>                               | <input type="text"/>                                             | <input type="text"/>                                                                               |
| Efficiency and Responsiveness (improvement of services, facilitation of intermodal transportation, decreasing logistics costs)                       | <input type="text"/>                               | <input type="text"/>                                             | <input type="text"/>                                                                               |
| Cooperation and Trust (increased information sharing, trust and cooperation among resident companies)                                                | <input type="text"/>                               | <input type="text"/>                                             | <input type="text"/>                                                                               |
| Sustainability (economic, social and environmental sustainability)                                                                                   | <input type="text"/>                               | <input type="text"/>                                             | <input type="text"/>                                                                               |

These two forms were filled up with linguistic expressions by the respondents which were corresponded by two different fuzzy scales given on Tables 47 and 48. The responses to these question forms were collected in a larger matrix and they were analyzed by using MATLAB software.

#### 4.2.2.5. The Analysis of Fuzzy QFD Matrices

The analysis process was handled according to the QFD steps that were planned during the design and data collection phases. Steps 1 and 2 were completed by the outputs of previous research phases and they were already on the QFD matrices distributed to the QFD team members. Step 3 was eliminated from the process as already explained. So the analysis part was started with Step 4, i.e. developing the final relationship matrix. The first objective of the analysis phase was to develop one final HoQ from the different matrices received from different respondents. To reach this objective, a special calculation process was handled through the help of MATLAB software.

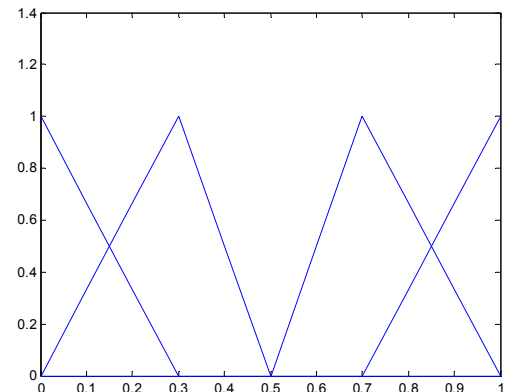
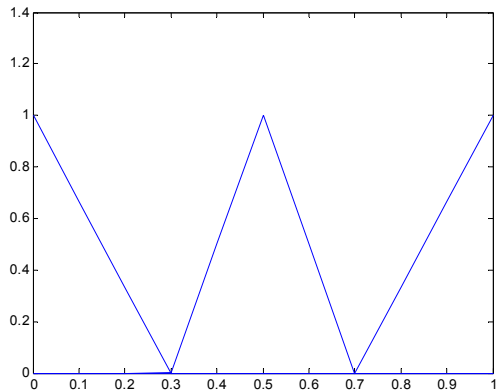
The eight different responses given to the 28 decision areas listed on the relationship matrix of the HoQ were collected on a single sheet. On some of the decision areas there was a consensus among the respondents regarding the power of the relationship so the final linguistic values of these boxes were directly recorded. However, for the majority of the boxes there were different human judgments that referred to different triangular fuzzy numbers. A mean value was required in order to decide the final classification of the specific relationship.

Calculating the means of triangular fuzzy numbers is a totally different process when compared with crisp numbers. The triangular numbers represent a membership function which is between a certain interval so mostly in order to reach a mean number, first the existing triangular numbers are converted into crisp numbers and then the arithmetic means are calculated. Nevertheless, for this study a different methodology was required in order to end up with a final result which falls in between the intervals of fuzzy triangular numbers listed on the scale.

First the triangular fuzzy membership functions were defined as vectors for the existing linguistic judgments. The codes for these intervals are listed on Figure 39. Their membership functions are shown on Figure 40. Then the existing 8 responses given to a specific relationship area were written in the form of an arithmetic operation and the result was divided by 8 just similar with the arithmetic mean.

Example: First Response =  $(5 * \text{weak} + 3 * \text{medium}) / 8$

**Figure 39.** MATLAB Codes for the Scales



**Figure 40.** Membership Functions of both Linguistic Scales

```
clearall;
x=0:0.1:1;
for i=1:length(x)
if x(i)<=0.3&& x(i)>=0
weak(i)=(-10/3)*(x(i)-0.3);
else
weak(i)=0;
end
if x(i)<=0.5&& x(i)>0.3
medium(i)=5*(x(i)-0.3);
elseif x(i)<=0.7&& x(i)>0.5
medium(i)=-5*(x(i)-0.7);
else
medium(i)=0;
end
end
if x(i)>=0.7&& x(i)<=1
strong(i)=(10/3)*(x(i)-0.7);
else
strong(i)=0;
end
end
plot(x,weak)
holdon
plot(x,medium)
holdon
plot(x,strong)
holdon
```

```
clearall;
x=0:0.1:1;
for i=1:length(x)
if x(i)<=0.3&& x(i)>=0
verylow(i)=(-10/3)*(x(i)-0.3);
low(i)=10/3*x(i);
elseif x(i)<=0.5&& x(i)>0.3
low(i)=-5*(x(i)-0.5);
else
verylow(i)=0;
low(i)=0;
end
end
end
if x(i)<=0.7&& x(i)>0.5
high(i)=5*(x(i)-0.5);
elseif x(i)<1&& x(i)>0.7
high(i)=-10/3*(x(i)-1);
else
high(i)=0;
end
end
if x(i)>=0.7&& x(i)<=1
veryhigh(i)=(10/3)*(x(i)-0.7);
else
veryhigh(i)=0;
end
end
plot(x,verylow)
holdon
plot(x,low)
holdon
plot(x,high)
holdon
plot(x,veryhigh)
holdon
```

All available responses were written down according to the above given formula and their membership functions were drawn with the help of the software. These figures were actually the mean of the eight responses that were given in the form of linguistic judgments. The final membership functions were composed of different intervals having different peaks. In order to convert them into usable numbers the averages were calculated for each membership function using Equation 4 according to center average defuzzifier methodology given by Wang (1997: 110).

$$(Equation\ 4) \quad R_i^* = \frac{\sum_{n=1}^i p_i x_i}{\sum_{n=1}^i p_i}$$

The results were used in order to justify the final linguistic judgment given to a specific relationship box. For instance, if the result for a certain calculation is 0,625 then the relationship between this customer expectation and this technical characteristic was specified as “medium”. All of the final centers of gravity and the final linguistic judgments are shown on Table 51.

**Table 51.** Final Linguistic Judgments for Relationship Matrix

| Box Number | Mean Value | Final Judgment | Box Number | Mean Value | Final Judgment | Box Number | Mean Value | Final Judgment | Box Number | Mean Value | Final Judgment |
|------------|------------|----------------|------------|------------|----------------|------------|------------|----------------|------------|------------|----------------|
| 1          | 0,188      | W              | 8          | 0,5        | M              | 15         | 0,643      | M              | 22         | 0,786      | S              |
| 2          | 1          | S              | 9          | 1          | S              | 16         | 0,643      | M              | 23         | 0,938      | S              |
| 3          | 1          | S              | 10         | 0,938      | S              | 17         | 0,643      | M              | 24         | 1          | S              |
| 4          | 0,688      | M              | 11         | 0,688      | M              | 18         | 0,5        | M              | 25         | 0,786      | S              |
| 5          | 0,563      | M              | 12         | 0,563      | M              | 19         | 0,357      | M              | 26         | 0,643      | M              |
| 6          | 0,625      | M              | 13         | 0,813      | S              | 20         | 0,714      | S              | 27         | 0,625      | M              |
| 7          | 0,75       | S              | 14         | 0,714      | S              | 21         | 0,583      | M              | 28         | 0,642      | M              |

Step 5: The same procedure was followed for the importance rankings of the customer expectations which was asked on the second part of this question form. This time the scale was composed of four linguistic judgments and their means were calculated accordingly. However for this process, there were common numbers belonging to two different fuzzy intervals. For such results, the higher peak values

were used in order to decide the final membership of the specific mean value. The results of the importance judgments are shown on Table 52.

**Table 52.** Final Linguistic Judgments for Importance Degrees

| Importance Degree for.. | Mean Value | Final Judgment |
|-------------------------|------------|----------------|
| CE1                     | 0,9625     | VH             |
| CE2                     | 0,8875     | VH             |
| CE3                     | 0,6        | H              |
| CE4                     | 0,675      | H              |

Step 6 and 7: The same procedure was followed for the competitive assessment part of the QFD. However, an additional step was added here for the calculation of the distance between the customer evaluations for a logistics center facility and one's own facility. The distance formula given in Equation 1 was used for calculating this distance and the resulting crisp number was used in order to calculate the weighted importance of a specific customer expectation with the help of Equation 2. The results are shown on Table 53.

**Table 53.** Calculation of Weighted Importance Values

|                       |                             | COMPETITIVE ASSESSMENT |                  |                |               |                              |
|-----------------------|-----------------------------|------------------------|------------------|----------------|---------------|------------------------------|
|                       |                             | Importance             | Logistics Center | Own Facilities | Distance<br>d | Weighted Importance<br>$W^*$ |
| CUSTOMER EXPECTATIONS | Competitive Advantage       | (0,7;1;1)              | (0,7;1;1)        | (0;0,3;0,5)    | 0,6           | (0,42;0,6;0,6)               |
|                       | Efficiency & Responsiveness | (0,7;1;1)              | (0,5;0,7;1)      | (0;0,3;0,5)    | 0,5           | (0,35;0,5;0,5)               |
|                       | Cooperation & Trust         | (0,5;0,7;1)            | (0,5;0,7;1)      | (0,5;0,7;1)    | NONE          | (0,5;0,7;1)                  |
|                       | Sustainability              | (0,5;0,7;1)            | (0,5;0,7;1)      | (0,5;0,7;1)    | NONE          | (0,5;0,7;1)                  |

Steps 8, 9 and 10: For the calculation of relative importance values the weighted importance evaluations of each customer expectation dimension was multiplied with the relationship degrees of that customer expectation dimension with the service characteristics. After that the products were summed for each service characteristics and consequently the customer expectations were translated into technical characteristics. The results gave the relative importances of service characteristics in a logistics center in terms of customer expectations and their importance evaluations. This process was handled in accordance with Equation 5.

$$\text{(Equation 5)} \quad RI_j = \sum_{i=1}^n W_i^* \otimes R_{ij}, j = 1, \dots, m$$

$W_i^*$ : fuzzy weighted importance of ith customer expectation

$R_{ij}$ : fuzzy number expressing the power of the relationship between ith customer expectation and jth service characteristic

$RI_j$ : fuzzy number for the final relative importance of the jth service characteristic

Then the marginal utility values of the service characteristics were calculated by using the RI values and the linguistic cost judgments regarding the investment required for developing each service characteristic. Using linguistic judgments for

the cost of implementation is an alternative for an ill-defined issue such as stating a definite monetary value for service characteristics shown on the QFD matrix. There are many different items in each service characteristic dimension and thus evaluating the final cost of their implementation would be a very difficult and vague issue. That's why the same fuzzy scale that was used for evaluating the importances and assessing the competition was employed at this step. After that the marginal utility values were calculated with the help of Equation 3. Table 54 exhibits the final HoQ.

**Table 54.** Final House of Quality

|                       |                             | TECHNICAL CHARACTERISTICS |                      |                          |                      |                     |                      |                   |                           |
|-----------------------|-----------------------------|---------------------------|----------------------|--------------------------|----------------------|---------------------|----------------------|-------------------|---------------------------|
|                       |                             | Supporting Institutions   | Basic Infrastructure | Warehousing & Intermodal | Secondary Supporters | Special Warehousing | Value Added Services | Standard Services | Weighted Importance<br>W* |
| CUSTOMER EXPECTATIONS | Competitive Advantage       | (0;0;0,3)                 | (0,7;1;1)            | (0,7;1;1)                | (0,3;0,5;0,7)        | (0,3;0,5;0,7)       | (0,3;0,5;0,7)        | (0,7;1;1)         | (0,42;0,6;0,6)            |
|                       | Efficiency & Responsiveness | (0,3;0,5;0,7)             | (0,7;1;1)            | (0,7;1;1)                | (0,3;0,5;0,7)        | (0,3;0,5;0,7)       | (0,7;1;1)            | (0,7;1;1)         | (0,35;0,5;0,5)            |
|                       | Cooperation & Trust         | (0,3;0,5;0,7)             | (0,3;0,5;0,7)        | (0,3;0,5;0,7)            | (0,3;0,5;0,7)        | (0,3;0,5;0,7)       | (0,7;1;1)            | (0,3;0,5;0,7)     | (0,5;0,7;1)               |
|                       | Sustainability              | (0,7;1;1)                 | (0,7;1;1)            | (0,7;1;1)                | (0,7;1;1)            | (0,3;0,5;0,7)       | (0,3;0,5;0,7)        | (0,3;0,5;0,7)     | (0,5;0,7;1)               |
|                       | Relative Importance (RI)    | (0,605;1,3;2,23)          | (1,039;2,15;2,8)     | (1,039;2,15;2,8)         | (0,731;1,6;2,47)     | (0,531;1,25;2,17)   | (0,871;1,85;2,62)    | (0,839;1,8;2,5)   |                           |
|                       | Cost                        | (0,5;0,7;1)               | (0,7;1;1)            | (0,7;1;1)                | (0,5;0,7;1)          | (0,5;0,7;1)         | (0,5;0,7;1)          | (0,5;0,7;1)       |                           |
|                       | Marginal Utility            | (0,605;1,857;4,46)        | (1,039;2,15;4)       | (1,039;2,15;4)           | (0,731;2,286;4,94)   | (0,531;1,786;4,34)  | (0,871;2,643;5,24)   | (0,839;2,571;5)   |                           |
|                       | Crisp Values                | 2,195                     | 2,335                | 2,335                    | 2,561                | 2,111               | 2,849                | 2,745             |                           |

The arithmetic operations between triangular fuzzy numbers were done according to below given equations (Kahraman et al., 2002; 2003).

If A and B are triangular fuzzy numbers and  $A = (a_1, a_2, a_3)$  and  $B = (b_1, b_2, b_3)$  then

$$\text{Addition; } A \oplus B = (a_1 + b_1, a_2 + b_2, a_3 + b_3)$$

$$\text{Multiplication: } A \otimes B = (a_1 b_1, a_2 b_2, a_3 b_3) ; k \otimes A = (ka_1, ka_2, ka_3)$$

$$\text{Division: } A \oslash B = \left( \frac{a_1}{b_3}, \frac{a_2}{b_2}, \frac{a_3}{b_1} \right)$$

As the marginal utility values were still triangular fuzzy numbers, they needed to be defuzzified for a final ranking between the service characteristics. For the defuzzification of these values Yager (1981) methodology was used which was also adopted by Bottani and Rizzi's (2006) study. If A is a triangular fuzzy number and  $A = (a, b, c)$  then it is converted to a crisp number by using the formula:  $\frac{a+2b+c}{4}$  (Equation 6).

According to the final rankings of the service characteristics of a logistics center, the intangible components of the overall market offering seem to have the highest utilities. Value added services like one-stop-shopping services, supply chain solutions, conflict resolution services, innovation and consulting services have received the highest priority. The standard services like security, safety, maintenance and repair get the second rank among the service characteristics. Among the tangibles part, the highest rank belongs to secondary supporters like the TIR parks, oil stations, working offices and such. This is also due to their lower cost when compared to the two following items of basic infrastructure and warehousing and intermodal infrastructure. These are ranked right after the secondary supporters because of their very high costs. Supporting institutions and special warehousing share the last rows according to the perceptions of this QFD team.

## CONCLUSION

Logistics research has a multidisciplinary structure that is explored from the lenses of various scientific areas such as management and organization, industrial engineering, economics, production management, and more. In a narrow sense, logistics centers are usually studied by the fields like transport geography, maritime transportation, and port logistics or cluster theory. The current study has developed a marketing based theoretical framework towards logistics clustering in the form of logistics centers and has made an exploratory, descriptive, and explanatory effort to define the industrial market offering of logistics centers by involving the industrial customers to the process.

In order to reach this main objective, the study adopted an abductive approach to scientific research and tried to apply theory matching to logistics centers which are quite new phenomena in logistics systems. Several marketing theories and schools are utilized in this theory matching process in order to generate certain propositions that lead to specific field research stages. The triangulated research approach supported the research process by contributing with the strong parts of both qualitative and quantitative research methods. Complementarity of the methods was used in order to justify the validity of the research and to maintain a broad coverage of perspectives.

Logistics centers, being nodes in global supply chains, are conceptualized as industrial service providers for their industrial customers in this study. Taking a customer oriented point of view, the study targeted to fill two main gaps in industrial marketing literature, which are already mentioned by Jacob and Ulaga (2008: 252). Firstly, the methodology of this study makes an attempt to present a systematic way to study customers' needs from the industrial service offerings of logistics centers. In addition to that, the theoretical perspective and methodology can assist the initiators of logistics centers in designing industrial service offerings that the customers will voluntarily pay for. The prioritization claim of the QFD analysis tries to balance scarce resources in favor of highly preferred service dimensions by industrial customers.

Relationship marketing theory and industrial networks approach have supported the customer involvement in the industrial service design process. These theories point out a critical perspective towards marketing management school by viewing the customer as an active party in marketing transactions. By taking their long-term relationship orientation between the market provider and the customer, this study states that such an industrial relationship should be established in the beginning of a logistics center initiative by involving the industrial customers to the service design process. By considering their preferences, the highly required industrial service dimensions would be easily discovered. The acknowledgment of the network links between LSPs and other possible tenants of logistics centers would provide a more effective design of the governance structure, the industrial service dimensions and the macro policies in such facilities.

Throughout the literature review, the study referred the new economy frequently. Despite its various definitions, the concept of new economy is significantly composed of service economy. Today, services are overtaking the share of manufacturing industries in the vast majority of the developed economies' GDPs. In this age of service economy, social capital, know-how, expertise, good network connections are becoming more valuable factors of production than the traditional factors of land or raw material. In line with these developments, the current study takes a service-dominant perspective to market offerings where no matter the offering is a tangible good or a service, it is an offering of services to the customer who is a co-creator of value in the marketplace. The highly tangible nature of the logistics center infrastructure is perceived as means or tools to deliver industrial services to the industrial customers.

Involvement of industrial customers into the prioritization of service dimensions requires a closer look to their buying processes and buying criteria when evaluating new services. The study used organizational buying theories and models in order to explore industrial buying criteria of logistics center customers regarding the services of such facilities. The existing OBB models assisted in drawing a systematic framework to both qualitative and quantitative research stages.

Logistics centers are clusters of companies that are operating in the logistics industry; so cluster theory was an important component of the study's framework in

terms of explaining the reasons that bring these companies together. Additionally, since the different schools of thought claim different motivations behind geographic concentration, a wider perspective deriving from these schools are used in classifying the determinants behind logistics clustering.

From the integrated perspective of these various theories and approaches, a unique research methodology which contained both qualitative and quantitative steps was followed in the study. This methodology is built on the core question of “*What are the primary industrial service design criteria according to industrial customers’ preferences, in a logistics center to be established in Turkey?*”. All steps in the methodology are designed with reviewing the logistics center literature elaborately.

#### **a. Discussion**

Logistics centers are nodes in today’s long and complex global supply chains. They also accommodate a complex network inside where different parties are either the suppliers or customers of each other depending on various transactions. With reference to Gummesson’s (1994b: 33) definition, the function of marketing in a logistics center is the creation, utilization, and maintenance of this network. However, the results of the research show that majority of the logistics center initiatives are perceived as real estate development activities. The construction of physical infrastructure has more priority when compared with stakeholder relations. This was emphasized by the respondents many times during the interviews, focus group session or in addition to survey responses. According to the LSPs, existing initiatives are being established without consulting to potential users and this creates a significant hesitation regarding their investment decisions.

The result of focus group discussion revealed that different LSPs focusing on different logistics activities have different reasons to take place in or buy services from logistics centers. A warehouse operator is interested in the location for collection and distribution opportunities, but the coverage of the center is important in terms of being local, regional or international. On the other hand, a rail operator is interested in economies of scale to be achieved by consolidation of cargo. While a shipper is interested in one-stop-shopping notion that will provide serious time

advantages, a port operator is interested in dry port facilities in terms of container yards and cargo transfer operations. Having a network of industrial customers with so heterogeneous expectations from logistics centers, it is essential for a logistics center company to involve them in the market offering design process and initiate infrastructure according to this network's requirements. This is also in line with the theoretical notion of marketing that states *a firm is best off by designing and directing its activities according to the needs and desires of customers in chosen target markets* (Grönroos, 1994c: 349).

The content analysis showed that majority of the industrial institutions perceives logistics centers together with railway transportation. This is a serious handicap for the Turkish experience due to the long-term state monopoly in the operation of railways. Turkish domestic transportation structure is highly dominated by a large network of highways and consequently road transportation. Railways have been neglected for a long time in terms of public investment and private interest. However, depending on the various definitions of logistics centers, such facilities are not able to operate without an active railway transportation system. Intermodality is a must for logistics centers. That's why certain regulations regarding railways, public investments and effective marketing communications for freight transport on rail are highly required for attracting private sector's attention. Existing privatization initiatives should be accelerated. The results show that LSPs are strongly objecting a state oriented governance structure in logistics centers. The top first item in the general tendency section of the questionnaire emphasizes the expectancy of private governance in logistics centers. This is a natural result of the current problems being faced in customs gates that influence logistics performance of providers in a negative way. Private sector mentality in the management of the logistics center and its units is required to convince industrial customers for investing in these facilities.

Another important term that is highly integrated with logistics centers was found out to be sea-shipping and ports. This is natural for Turkey where majority of international transportation is handled by maritime transportation. A large portion of the logistics center literature is also related with maritime transportation, port-hinterland connections, and port-logistics center integration. The results of the study showed that logistics center initiatives must be designed according to sea-gates. Port

integration is essential for the transfer of freight to international transport systems. According to the literature related with the development of inland nodes, such facilities have an inside-out nature in developing countries like Turkey. In other words, inland nodes like logistics centers try to integrate with seaports in developing countries in order to reach international freight networks. Some respondents stated that the location selection decisions of current initiatives in Turkey are not being taken according to these principles and this will cause idle facilities in the future with no connections to either trade centers or international gateways.

An important but a contradictory result is related with the competition inside logistics centers. In the responses to the questionnaire, majority of the LSPs stated that their company would not object in being located at the same geographical spot with their competitors. However, in interviews with logistics industry institution representatives and in the focus group study, the participants were very hesitant about this issue. There are two perspectives of this hesitation. The first one is related with the governing body. The LSPs are not convinced that all tenants in the logistics center will be equally treated and they will lose market share or customers due to unfair trade practices. Especially small-sized LSPs believe that large LSPs will dominate the facility, the governing body will not be able to set a balance and this will threaten their business.

The other statement regarding the competition issue is about the daily competition between LSPs. There is significant synergy advantage of logistics centers due to their cargo consolidation advantages and utilization of common infrastructure. However, LSPs believe that while operationalizing these steps their customer portfolios will be vulnerable against competitive attacks. They are afraid to lose market share and naturally profits due to locating together with competitors.

The transcription of the interview with FV2 shows that this hesitation can only be eliminated with a strong logistics industry depending on contracts mainly. The fragile structure of the Turkish logistics industry with fierce competition, low barriers to entry, low profit margins and dependence on traditional logistics services instead of value added logistics services causes LSPs to avoid horizontal cooperation. This brings out the question related with the logistics potential of the country which is highly dependent on the foreign trade traffic. Macro policies are

needed to support logistics industry and freight movement. Barriers in front of logistics channels should be removed to attract more investment. This will enlarge the total market size and provide new opportunities for LSPs. Consequently, they can discover the opportunities in cooperation as they are operating in a large network and they possess different resources and skills that may complete each other.

One important result of the study is that logistics centers are not communicated well with the industry and especially the potential customers. The answer to the question that was asked to measure the LSPs' general knowledge level of logistics centers was relatively low. This means that LSPs who are the largest group of potential industrial customers of logistics centers need to be informed about logistics centers, their advantages, worldwide examples and current initiatives. This is critical step to involve them into the value creation process.

The majority of the LSPs that joined the research believe that there will be sufficient demand to a logistics center that will be established around their operational area. However, it should be noted that the results of the qualitative research steps indicated the variance in LSPs expectations from such facilities. The descriptive outputs also support this point by low rankings for purchasing land, making investments, shifting part or all of the operations to the logistics centers. According to these results, LSPs will tend to keep their existing facilities and continue with their operations due to their hesitations towards logistics centers, but they will initiate market relationships with the center through either service purchasing, renting facilities or buying land.

The descriptive statistics for the tangible components of the logistics center service showed that, in accordance with the content analysis results, the most important requirement is the intermodal terminal. Information technology infrastructure, rail-road interface and seport integration follow this component. The authorities should organize the design and construction activities of logistics centers by taking these preferences into consideration. Other components sharing the lower ranks of the list like libraries, hotels, university research units do not have priority during the initial establishment phase according to Turkish LSPs.

Opposing to the Italian freight village model, the least important intangible component in this study was selected as real estate development services. So the

Turkish LSPs don't perceive the logistics center company as a real estate developer. Instead they require safety and security services and one-stop-shopping advantages from such a company. LSPs are operating in a complex network and they believe that logistics centers will smooth these business transactions by providing a common location for all members of this network.

The customer requirements from a logistics center were explained under four main factors. The factor that explains the overall variance in this scale was named as "Competitive Advantage". Inline with the one-stop-shopping expectancy, LSPs believe that by locating together at the same geographical area they will achieve advantages in terms of proximity to resources and proximity to vendors. In addition to that, they will be able to impact supply and demand markets or their task environment in a more effective way due to the concentrated power they have. The synergy inside the center will facilitate innovation and increase shared best-practices.

The second factor emphasizes that the LSPs perceive the responsiveness advantage of logistics centers together with cost reduction advantages. So according to LSPs, by locating in a logistics center they will achieve cost advantages and decrease their costs while increasing their flexibility capabilities and market offering varieties. The third factor summarizes the increased cooperation and trust expectations of the industrial customers. The last factor groups triple bottomline of sustainability under one dimension, and refers to the sustainability expectations of these customers.

Although these factors are derived from the analysis, not all of them can explain the buying intentions of industrial customers of services or land from logistics centers. When the buying intention factor is considered to be a general variable that includes buying services, land or making broad investments, then except the sustainability dimension, all other three expectation factors have respective explanatory powers. These are essential inputs for policy makers and logistics center management because these expectations should be targeted for satisfaction in order to attract more tenants inside the centers. The marketing programs and promotional activities of these facilities should be prepared by taking these dimensions into consideration. Competitive advantage possibilities should be emphasized and should be exhibited by communicating best practices both locally and internationally. As

these expectations increase, the LSPs' buying tendency from logistics centers will increase as well.

When the independent variable of general buying tendency is decomposed into three components of buying land, buying services or making an investment, the variables explaining the variance change. For explaining the land purchasing tendency of the potential customers, their expectations regarding the competitive advantage that they will maintain in a logistics center and their efficiency and responsiveness expectations should be monitored. Cooperation and trust expectations or sustainability expectations do not impact the tendency of them to buy land from logistics centers. For explaining service buying tendency, all three dimensions can be used except sustainability expectations. The general investment tendency, on the other hand, can only be explained by efficiency and responsiveness expectations.

One other outcome of this explanatory part of the study was related with the organizational buying model dimensions. The final buying decision from logistics centers is found out to be influenced by only two dimensions of Webster and Wind's (1972b) organizational buying model which are the macro environment and buying center interaction. The signs of these relationships are not the same. Macro environment and final buying decision have a negative relationship which can be explained through the adverse effects of instability. When the macro environment components like the economic, political, legal, socio/cultural or physical environment are not stable, this causes a negative impact on the final buying decisions of LSPs from logistics centers. This indicates that LSPs expect macro environment conditions such as growing economic trends, increasing buying power, stable economic indices, constructive business policies or laws that ease logistics transactions in order to be classified as a buyer of logistics centers. This is also supported by the German model of freight villages where LSPs enjoy an industry with a big market size, a stable economy, policies working fast and in favor of logistics industry, laws facilitating the shift of logistics business from city centers to logistics clusters and public promotion of logistics centers with sustainability objectives. These macro environmental conditions foster the number of tenants in German logistics centers. Turkish policy makers should consider these when

initiating such facilities and they should work in coordination with other units that have the power to influence or regulate these macro environment dimensions.

One other important factor that has an impact on the final purchase decision is the buying center interaction which is a relatively micro level dimension. The logistics center companies should specify and target the buying centers of LSPs in order to initiate, facilitate and sustain long-term business relations with them. The marketing communications should be directed to these buying centers and the members of the buying centers should be well informed about the logistics center activities. The interaction in these buying centers has a significant relationship with the final buying decisions of LSPs from logistics centers. As stated by Aifandopoulou et al. (2006) transportation sector is shaped by logistics industry's demands. The members of the buying centers are the ones shaping the demands for new logistics policies and trends. Therefore new solutions like logistics centers should be discussed with the members of the buying centers of LSPs as the representatives of the logistics industry.

These steps of the research tried to explain the variables influencing the buying tendency of industrial customers. In order to reach the overall aim of the study, the service dimensions of the logistics center should be prioritized according to customer expectations. QFD was used as a tool to translate customer requirements into service characteristics and a HoQ was built by using the outputs of previous research steps. The customer expectations were used as the WHATs of HoQ. The HOWs were derived from the factor analysis applied to the tangible and intangible components of the logistics center's market offering. Fuzzy logic was used in order to eliminate the variance of human judgments.

According to the results, the intangible components of the market offering have highest utility ranks depending on the customer expectations. Although, terms like rail transportation, intermodal terminal, seaport integration were frequently repeated during the qualitative research steps and despite their high ranking in the descriptive statistics, they are not the ones to secure the highest utility from the logistics center market offering. This is due to the fact that these infrastructure items have a higher cost when compared with soft components like value added services. When the relative importance values of the service dimensions are analyzed, the

priority is shared between main infrastructure and warehouse&intermodal dimensions. Therefore according to industrial customer preferences, these two dimensions are the most important and prioritized ones. However, when the cost issues are included in the analysis the highest utility is derived through the two soft components, value added services and standard services.

Additionally, the LSPs perceive these tangible components of the offering as must-be requirements of logistics center services. Without an intermodal terminal or seaport integration such a facility will be useless. So these will be included in the offering in any case but to achieve utility, these tangible components should be supported with strong intangibles. This is quite similar to the German model of freight villages where “soft” services are provided by the logistics center companies and the rest of the operations are left to independent providers. Supply chain solution services, safety and security services, value added logistics services, conflict management services are all among service offerings that the logistics center company should develop in order to achieve utility.

Among the tangible components of the market offering, the highest utility rank is shared by secondary supporters, basic infrastructure, warehousing and intermodal which are the basics of the logistics centers. Without these, the intangible components are not able to be delivered. Therefore these investments should be carried on but the market offering should be designed with a higher emphasis on the intangible parts. This requires a high degree of logistics and marketing expertise and a strong customer focus.

### **b. Implications for Practitioners**

The outputs of this study present several implications for both practitioners and scholars. Firstly, logistics centers are attracting attention from both public and private sector in Turkey during the last five years. Public sector makes new investments in specific geographical spots and tries to attract private sector to these cluster initiatives. Private sector, on the other hand, makes attempts to build their own facilities in especially trade-intensive regions. However, the existing investments do not have a standard development plan and they are not established with a market focus. The state carries public concern in terms of land development

and economic acceleration possibilities in the investment regions. The private sector tries to gain first-mover advantages in logistics cluster building and seize the opportunity of clustering. However, the LSPs indicate that they are not included at any stage of these development efforts. They state that they are not being consulted about their thoughts or they are not acknowledged enough regarding the details of these projects in a transparent manner. This creates a serious disturbance and avoidance from such projects among these potential customers. Therefore, the results of this study may provide inputs for logistics center undertakers both from the public and the private sector by representing the voice of the customer, the LSPs specifically.

In addition to that, the results of the study will provide a general picture regarding the LSPs' perceptions, tendencies related with logistics centers. The civil society institutions operating in logistics or related areas, the LSPs from all segments, the exporters, importers or other members of the supply chains like retailers or wholesalers can use these results to review the opinions of the sector. The civil institutions can establish lobbying campaigns in favor of the industry members regarding the industrial service design in logistics centers. This would create an involvement in the value creation process of logistics centers. The LSPs may use this study as a knowledge resource and try to seek the opportunities to cooperate with their competitors for achieving the benefits of clustering in logistics centers. The other members of the supply chains will be the second tier customers of logistics centers and some of them will take part inside such facilities. This study's results may be used as inputs for shaping their demands from LSPs. In the end, they will be highly influential in motivating LSPs investing in logistics centers. As mentioned by Tsamboulas and Kapros (2003: 142) *logistics centers are the part of an integrated transport system which is developed or revised by the shipper ( the customer of the logistics center).*

### **c.Implications for Scholars**

Apart from these practical implications, the study has some contributions to the scholarly research in the field of logistics centers. As already mentioned in

previous sections, a marketing focus in logistics center research is not observed frequently in the literature. The development of the theoretical framework and the integration of the research with alternative marketing approaches is considered as a contribution to both the marketing and the logistics literature. Furthermore, the usage of cluster theory as a mediating theory to operationalize the propositions also leads the way for future research that combines cluster theory with transportation geography.

As mentioned by Edvardsson and Olsson (1996), to create favorable customer outcomes, it is important to explore the ideas, suggestions and behavior of customers and taking the customer perspective into account when building up services. QFD is a tool for including customer expectations to product design. When combined with fuzzy logic, the variability of human judgments and perceptions can be eliminated. However, application of fuzzy QFD is rarely used for the design of industrial services. The existing studies in the field of logistics generally use fuzzy QFD for supplier selection, service quality in terminals or selection of specific logistics service characteristics. To the best of the author's knowledge, the method has never been used for logistics centers. Therefore the study has also a methodological contribution to scholarly research in industrial service marketing and logistics center literature.

Following Stank and Roath's (1998) exploratory effort to study customer expectations from inland nodes and Walter and Poist's two studies (2003; 2004) that enhance this effort to LSPs, this study presents exploratory, descriptive and explanatory steps regarding the market offering of logistics centers. The results of the study explore and classify the customer expectations from logistics centers and the technical characteristics of the industrial service provided by logistics centers. The outputs of the research describe and define the opinions, perceptions and tendencies of LSPs regarding logistics centers and the most highly preferred service items in such facilities. Study also explains the variables affecting the final purchasing decisions of services from logistics centers and the prioritized dimensions of logistics centers' market offerings. Future studies may extend these efforts to explore industrial customer tendencies within or among regions. In an age where transportation networks are tried to be integrated in a seamless way, involvement of

customers into the design process of different transport solutions is essential especially in the case of inter-regional initiatives. Therefore scholarly research that holds an international marketing approach and that covers industrial customer views for transportation decisions would be fruitful for the development of the literature in this field.

#### **d.Limitations of the Study**

The study also has some limitations. Firstly a comprehensive benchmark with more examples from the world would contribute a lot to the benchmark and would provide valuable results for especially practitioners. However, it was not possible to include more examples due to financial and physical constraints. So some samples from the close geographic area were chosen for analysis. Future studies may enhance the sample of the interview with existing successful freight village examples and provide a more comprehensive resource for future benchmarks.

A second limitation is related with the reseach field. The research has been carried out in Turkey so it is limited with regional characteristics of this area and limited with the sample operating in this area. The responses given to the questions are bound to Turkey-specific policies, regulations and organizational culture. This limitation can be considered at the same time as a benefit for Turkish practitioners. Additionally, future studies may be repeated in different country settings and cross-cultural differences may be analyzed.

To conclude, logistics clusters and logistics centers will be agenda of the practitioners and the scholars during the near future. The dynamics of these entities will attract attention from both sides. Their dual structure with both public and private interest will require new governing structures, different marketing strategies and complex integration policies. Involvement of potential customers in the design and development of these projects is essential in order to secure success. A strong market focus and close relationships with the market actors will support healthy industrial service development and prevent excess or idle spending of public and private funds.

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## **APPENDICES**

## APPENDIX 1. The Literature Review for Fuzzy QFD and Logistics Research

**Table A1.** Literature Review of Studies Combining Logistics with Fuzzy QFD

| Author(s)                                          | Year | Name of the Article                                                                                                     | Journal                                                                                                            | Purpose                                                                                  |
|----------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| M. Bevilacqua,<br>F.E. Ciarapica,<br>G. Giacchetta | 2006 | A fuzzy-QFD approach to supplier selection                                                                              | Journal of Purchasing and Supply Management, 12(1), pp. 14-27                                                      | Supplier selection by fuzzy QFD                                                          |
| M. Celik,<br>S. Cebi,<br>C. Kahraman,<br>I. D. Er  | 2009 | An integrated fuzzyQFD model proposal on routing of shipping investment decisions in crude oil tanker market            | Expert Systems with Applications Volume 36, Issue 3, Part 2, April 2009, pp. 6227–6235                             | Shipping investment decisions by Fuzzy oriented Ship of Quality tool                     |
| J. Ding                                            | 2009 | Applying fuzzy quality function deployment (QFD) to identify solutions of service delivery system for port of Kaohsiung | Quality & Quantity Volume 43, Number 4, 553-570                                                                    | Fuzzy QFD tool used for service delivery system for port of Kaohsiung                    |
| S.H. Amin,<br>J. Razmi                             | 2009 | An integrated fuzzy model for supplier management: A case study of ISP selection and evaluation                         | Expert Systems with Applications Volume 36, Issue 4, May 2009, Pages 8639–8648                                     | Interner service provider selection with fuzzy QFD                                       |
| W. Feng<br>L. Xu-hong ;<br>R. Wei-na ;<br>Z. Yong  | 2007 | A Fuzzy QFD-Based Method for Customizing Positioning of Logistics Service Products of 3PLS                              | International Conference on Wireless Communications, Networking and Mobile Computing, 3331 - 3334 21-25 Sept. 2007 | Fuzzy QFD tool used to customize 3PL services for customer satisfaction.                 |
| M. Zarei,<br>M.B. Fakhrazad,<br>M. J. Paghaleh     | 2011 | Food supply chain leanness using a developed QFD model                                                                  | Journal of Food Engineering Volume 102, Issue 1, January 2011, Pages 25–33                                         | Fuzzy logic in QFD used to figure Lean Attributes and Lean Enablers in food supply chain |

|                                             |      |                                                                                                                                            |                                                                                                                     |                                                                                                                                   |
|---------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| A. H. I. Lee<br>C. Lin                      | 2011 | An integrated fuzzy QFD framework for new product development                                                                              | Flexible Services and Manufacturing Journal<br>Volume 23, Number 1 (2011), 26-47                                    | Fuzzy logic combined with QFD is used for successful new product development process                                              |
| Y. Yan<br>H. Liu,<br>Y. Zhang,<br>Z. Zhou   | 2010 | A fuzzy-QFD approach to design decision support system for emergency response of hazardous materials road transportation accidents         | Automation and Logistics (ICAL), 2010 IEEE International Conference on 16-20 Aug. 2010, 506 - 510                   | Fuzzy QFD used for building a decision support system for emergency response to hazardous materials road transportation accidents |
| Q. Liu,<br>J. Liu,                          | 2011 | Green supplier selection research based on the grey relation and the fuzzy quality function deployment                                     | Science-Technology and Management, 13 (2011), 54-57                                                                 | Fuzzy QFD used for selection of green suppliers                                                                                   |
| M. Hayede,<br>S. Hossein,<br>D.Keramatoolah | 2011 | Strategic management of logistics services with a fuzzy qfd methodology” “a case study in pars electric company                            | Management research in iran (modares human sciences) summer 2011; 15(2 (71):151-179.                                | Fuzzy QFD is used for improving logistics services in electronic parts manufacturing industry                                     |
| C. Hsu,<br>A. Chang,<br>H.Kuo               | 2011 | Green Supply Implementation based on Fuzzy QFD: An Application in GPLM System                                                              | Issue 6, Volume 10, pp. 183-192                                                                                     | Fuzzy QFD is used for Green Supply and Green Product Lifecycle Management                                                         |
| G. Liang,J. Ding,<br>C. Pan                 | 2012 | Applying fuzzy quality function deployment to evaluate solutions of the service quality for international port logistics centres in Taiwan | Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment | Fuzzy QFD is used for improving service quality in port logistics centers in Taiwan.                                              |
| S.M. Gupta,<br>S. Nukala                    | 2006 | Effective marketing of a closed-loop supply chain network: a fuzzy QFD approach                                                            | Proceedings of the SPIE International Conference on Environmentally Conscious Manufacturing                         | Fuzzy QFD is used for building up the marketing strategy for a closed-loop supply chain.                                          |

|                                              |      |                                                                                                                                |                                                                                                                                    |                                                                                                    |
|----------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|                                              |      |                                                                                                                                | VI, Boston, Massachusetts, pp. 165-171, October 1-3, 2006                                                                          |                                                                                                    |
| Z. Ayağ,<br>F. Samanlıoğlu,<br>G. Büyüközkan | 2012 | A fuzzy QFD approach to determine supply chain management strategies in the dairy industry                                     | Journal of Intelligent Manufacturing                                                                                               | Fuzzy QFD used for specifying logistics requirements and supply chain strategies                   |
| P. Kumar,<br>R. Shankar,<br>S. S. Yadav      | 2012 | An analysis of supplier development issues in global context: an approach of fuzzy based modelling                             | International Journal of Logistics Systems and Management<br>Volume 11,<br>Number 3/2012<br>Pages 407-428                          | Fuzzy QFD used for specifying supplier development requirements depending on customer requirements |
| W. Su-fang ;<br>X. Lin-jun                   | 2007 | A Multi-perspective Methodology for 3PLS to Select Contingent Plan                                                             | Management Science and Engineering, 2007. ICMSE 2007. International Conference on<br>Date of Conference: 20-22 Aug. 2007 740 - 745 | Fuzzy logic in QFD used for contingency management with a multiple perspective for 3PLS            |
| P. Kumar,<br>R. Shankar,<br>S.S. Yadav       | 2011 | Global supplier selection and order allocation using FQFD and MOLP                                                             | International Journal of Logistics Systems and Management<br>Volume 9,<br>Number 1/2011<br>Pages 43-68                             | Fuzzy QFD for global supplier selection                                                            |
| G. Liang,<br>J. Ding,<br>C. Wang             | 2012 | Applying fuzzy quality function deployment to prioritize solutions of knowledge management for an international port in Taiwan | Knowledge-Based Systems<br><br>Volume 33,<br>September 2012,<br>Pages 83–91                                                        | Fuzzy QFD for knowledge management in port areas (Taiwan case)                                     |

|                                 |      |                                                                                                                    |                                                                                                                      |                                                                                                                                         |
|---------------------------------|------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| G. Liang,<br>T. Han,<br>T. Chou | 2005 | Using a Fuzzy Quality Function<br>Deployment Model to Identify<br>Improvement Points in Airport<br>Cargo Terminals | Transportation<br>Research Record:<br>Journal of the<br>Transportation<br>Research Board<br>Volume 1935 /<br>130-140 | Fuzzy QFD for service<br>quality assurance before<br>the service action is<br>realized. Taiwan airport<br>cargo terminal case<br>study. |
| F. Zandi,<br>M. Tavana          | 2011 | A fuzzy group quality function<br>deployment model for e-CRM<br>framework assessment in agile<br>manufacturing     | Computers &<br>Industrial<br>Engineering<br>Volume 61, Issue<br>1, August 2011,<br>Pages 1–19                        | Fuzzy QFD supports<br>TOPSIS as a tool in order<br>to evaluate agile e-CRM<br>processes                                                 |
| I. Erol,<br>W.G. Ferrell Jr.    | 2004 | A methodology to support<br>decision making across the<br>supply chain of an industrial<br>distributor             | International<br>Journal of<br>Production<br>Economics, 89,<br>pp. 119–129                                           | Fuzzy QFD used for<br>maximizing total value<br>chain satisfaction and<br>minimizing total cost of<br>supply chain operation            |

## APPENDIX 2.Türkçe Yönetici Özeti

### GİRİŞ

Tedarigin, üretimin ve dağıtımın küresel ölçekte yürütüldüğü günümüz iş dünyasında, kendisi de küresel ölçeğe ulaşan lojistik endüstrisi, çok sayıda üretim ve hizmet sektörüne destek olmakta ve bu sektörlerde yaşanan değişimlere hızlıca yanıt vermek durumunda kalmaktadır. Her geçen gün uzayan tedarik zincirleri, uluslararası ölçekte yaşanan ekonomik krizler, işletmelerin çevresel ve sosyal etkilerinin yakın kontrolüne duyulan ihtiyaç, maliyet ve karlılık üzerindeki baskılar lojistik sektörüne, küçük ölçekli ve sık siparişler, çevreye duyarlı lojistik hizmetleri, yüksek hizmet seviyesine karşılık rekabetçi fiyatlar gibi talepler aracılığı ile yansımaktadır. Üretim ve hizmet sektörlerinde artan dış kaynak kullanımı ile söz konusu talepler birleşerek entegre lojistik faaliyetlerine dayanan yeni hizmet sunumlarını doğurmuştur. İşletme içi lojistik faaliyetlerinin dış kaynağa devri, öncelikle üçüncü taraf lojistik hizmet sağlayıcıları (3PL), daha sonra 3PL şirketlerini işletmeler adına koordine eden ve ağırlıklı olarak bilgi sistemi temelli çalışan dördüncü taraf lojistik hizmet sağlayıcılarını (4PL) doğurmuştur. İşletmelerde verimliliği artırma baskısı ve çevresel kaygıların etkisiyle, bu entegrasyon girişimleri diğer sektörlerde de görülen kümelenme faaliyetlerine dönüşmüş ve lojistik kümeleri oluşmuştur.

Lojistik kümeleri lojistik sektöründe faaliyet gösteren kurumların veya bu kurumları çeşitli mal ve hizmetlerle destekleyen diğer işletmelerin coğrafi olarak aynı noktada toplanması ile oluşmaktadır. Kümelenmenin ana amacı, tekil işletmeler için yüksek yatırımlar gerektiren ortak altyapıyı kullanarak ölçek ekonomisinden faydalanmak ve böylece birim maliyetleri düşürmektir. Avrupa’da, ABD’de ve Uzakdoğu’da başarılı örnekleri görülen lojistik kümeler ile ilgili Türkiye’de de gerek devlet, gerekse de özel sektör aracılığıyla yeni yatırımlar yapılmaya başlanmıştır. TCDD tarafından kurulmakta olan lojistik merkezler (köyler), Ankara’da özel sektör girişimi ile faaliyete geçmiş olan Ankara Lojistik Üssü, Manisa’da Organize Sanayi Bölgesi’nde yer alan firmaların yatırımları ile kurulmuş olan MOS Lojistik bu yatırımlara birer örnek teşkil etmektedir.

Türkiye Cumhuriyeti'nin 2023 dış ticaret hedefleri ışığında yapılan bu girişimlerin yüksek bir önem arz ettiği düşünülmektedir. 1,2 trilyon dolarlık dış ticaret hedefinin mevcut lojistik altyapısı ile karşılanamayacağı tüm ilgili taraflarca defalarca dile getirilmiştir. Küresel lojistik sistemlerine entegre olabilecek ve yük akışının mümkün olduğunca hızlı bir şekilde yönlendirileceği lojistik düğüm noktaları, limanlar, havalimanları ve diğer sınır kapıları ile de desteklendiği takdirde, Türkiye'nin rekabetçi gücü artacak ve dış ticaret faaliyetleri küresel pazarlara sürdürülebilir şekilde entegre olacaktır. Ancak bu yatırımların atıl kalmasını önlemek için, kurulacak olan lojistik merkezlerin müşteri ihtiyaçlarını ve sektör beklentilerini karşılayacak şekilde tasarlanması gerekmektedir. Mevcut durumda müşterilerin kendi özel yatırımları veya dış kaynak kullanımıyla karşıladıkları ihtiyaçlarını bu merkezlere kaydirmalarını sağlamak için öncelikle onların beklentileri ortaya çıkarılmalı ve hizmet tasarımı bu doğrultuda yapılmalıdır.

Tüm bu gelişmeler ışığında, bu çalışmanın temel amacı, Türkiye'de kurulacak bir lojistik merkezin sunacağı endüstriyel hizmet boyutlarını, müşteri beklentilerini göz önünde bulundurarak önceliklendirmektir. Bu amaca ulaşmak için:

- 1- Pazarlama teorileri çerçevesinde, lojistik merkezlerde endüstriyel hizmet tasarımına yönelik öneriler geliştirilmiş;
- 2- Lojistik merkezler tarafından sunulacak hizmet endüstriyel bir hizmet olarak kavramsallaştırılmış;
- 3- Lojistik merkezlerin potansiyel müşterilerinin bu tesislerden beklentileri ve Avrupa'da faaliyette bulunan benzer tesislerin hizmet özellikleri çeşitli nitel araştırma yöntemleri aracılığıyla incelenmiş;
- 4- Türkiye'de faaliyet gösteren 3PL firmaları üzerinde yapılan nicel araştırma sonucunda, lojistik merkezlerin potansiyel müşterilerinin bu merkezlerden öncelikli beklentileri sıralanmış, müşterilerin bu merkezlerden yer ya da hizmet satın alma faaliyetlerini açıklayan değişkenler belirlenmiş ve lojistik merkezlerin hizmet boyutları müşterilerin beklentileri doğrultusunda önceliklendirilmiştir.

Çalışmanın sonuçları, Türkiye lojistik sektörünün lojistik merkezlere yönelik algılarını analiz ederek geleceğe yönelik öneriler sunmaktadır. Çalışma pazarlama teorisi ile lojistik merkezlerini birleştirerek literatüre katkıda bulunmaktadır. Elde

edilen sonuçların, hem lojistik alanında politika uygulayıcılarına, hem de özel sektöre, lojistik merkez girişimleri ile ilgili olarak yol göstermesi beklenmektedir.

## 1. LOJİSTİK KÜMELER

### 1.1. Lojistik Küme Sınıfları

UNESCAP (2009) sınıflandırmasına göre lojistik kümeleri beş ana sınıfa ayrılmaktadır. Bunlar konteyner sahaları, iç bölgelerde bulunan konteyner depoları, intermodal terminaller, kuru limanlar ve lojistik köyler olarak adlandırılmaktadır. Literatürde bu ana sınıfların her biri için farklı isimlerin kullanıldığı görülmektedir. İsim çeşitliliği bölgesel olarak farklılaşabildiği gibi, kullanılan ulaştırma moduna, coğrafi kapsama veya ait olduğu hiyerarşik seviyeye göre de değişim göstermektedir. O sebeple bu özet metninde, sınıflandırma çalışmalarının içinde en geniş kapsamlı ve en son girişim olan Higgins vd.'nin (2013) düzenlemiş olduğu ana gruplar açıklanacaktır.

Higgins vd. (2013) kapsamlı bir literatür taramasından sonra lojistik kümelere verilen tüm isimleri üç seviye ve altı ana grup altında toplamıştır. Birinci seviyede depolama ve dağıtım kümeleri bulunmaktadır. İkinci seviyede yük transferi ve dağıtım yapan küme tipleri yer almaktadır. Lojistik küme hiyerarşisinin en üstünde bulunan üçüncü seviye ise “ana kapı” ismiyle anılmaktadır. Çalışmada, bu üç seviye altında yer alan altı sınıf detaylı olarak tanımlanmıştır.

#### 1.1.1. Birinci Seviye Lojistik Kümeler

Bu seviyenin altında iki ayrı ana grup yer almaktadır. Birinci grubu **depolar** veya **konteyner sahaları** oluşturmaktadır. İkinci grupta ise **dağıtım merkezleri** ve **iç bölge konteyner depoları** bulunmaktadır. Endüstriyel parklar da bu ikinci gruba dahil edilmiştir.

**Depo:** Envanter stoklama alanları olan depolar tedarik zincirinin farklı üyeleri olan tedarikçiler, üreticiler ve müşteriler arasındaki akışı düzenleyen alanlardır. Depolar tedarik zincirine özgü, zamana dayalı ve talebe bağlı kısıtları

dengeleyen ögelerdir. Zaman içerisinde kendilerini farklılaştırmak amacıyla etiketleme, paketleme, ayrıştırma gibi çeşitli katma değerli lojistik hizmetleri de sunmaya başlamışlardır.

**Konteyner Sahası:** Konteyner sahaları serbest şekilde paketlenmiş envanterin stoklandığı depolardan farklı olarak konteynerize eşya için geliştirilmiş lojistik küme çözümleridir. Bu alanlarda boş ve dolu konteyner stoklama, konteyner temizleme, tamir ve bakım hizmetleri sunulmaktadır. Depoların tedarik zincirleri içindeki akışa destek vermesine benzer olarak, konteyner sahaları da gelen veya giden yükler için konteyner teslim ve alımını kolaylaştıran merkezlerdir. Sahası sınırlı olan ana terminallere veya lojistik merkezlere yakın bir şekilde konumlandıkları görülmektedir. Ülkemizde de liman sahalarının yetersizliği ve yüksek stoklama maliyetleri sebebiyle konteyner sahaları sıklıkla tercih edilmektedir.

**Dağıtım Merkezi:** Dağıtım merkezleri tek bir depodan veya birden fazla deponun birleşiminden oluşan ve eşyaların hızlı hareketini sağlamayı hedefleyen lojistik kümelerdir. Depolardan en önemli farkları, stoklamaya değil de akışın hızlı ve hatasız gerçekleştirilmesine odaklanmış olmalarıdır. Temel olarak, akışı hızlandırmaya yönelik çapraz sevkiyat, döngüsel sefer yönetimi, taşıma kapları arası aktarım gibi hizmetler vermektedir. Ayrıca bilgi sistemi yönetimi, tersine lojistik yönetimi, etiketleme, barkodlama gibi çeşitli katma değerli hizmetler de sunmaktadır. Fonksiyonel olarak sadece tedarikçilerden toplama ve fabrikalara dağıtım faaliyetlerini yürüten dağıtım merkezlerinin yanı sıra, kentsel tüketim merkezlerine farklı talep miktarları ve çeşitleri doğrultusunda dağıtımı düzenleyen merkezler de bulunmaktadır.

**İç Saha Konteyner Depoları:** Dağıtım merkezlerine benzer şekilde, iç saha konteyner depoları konteynerlerin stoklanmasından çok hareketine odaklanan alanlardır. Geleneksel konteyner sahalarından farklı olarak, iç saha konteyner depoları limanlarda verilen konteyner elleçleme, dökme yük elleçleme, gümrükleme ve denetim gibi hizmetleri de sunabilmektedir.

### 1.1.2. İkinci Seviye Lojistik Kümeler

Bu seviyenin altında *intermodal terminaller, iç limanlar* ve *lojistik köyler* yer almaktadır. Transmodal terminal, intermodal yük merkezi, aktarma terminali, intermodal ve multimodal endüstriyel park gibi tanımlamalar intermodal terminaller ana grubu altında birleştirilmiştir. Uydu terminal, kuru liman, hinterland terminal, barge terminal, yük merkezi gibi lojistik küme isimleri ise iç limanlar ana başlığı altında toplanmıştır. Lojistik köyler ise lojistik merkezler ile eş anlamlı olarak kullanılmaktadır.

**İntermodal Terminal:** Bu lojistik kümeler yük akışlarının birden fazla ulaştırma modu arasında, taşıma kabından çıkarılmaksızın ve bölgesel ya da uluslararası yolculuğuna devam etmek üzere aktarıldığı terminallerdir. Bu terminallerde kara, demir veya iç su yolları arasında aktarma yapmak üzere gerekli altyapının kurulu olması gerekmektedir.

**İç Liman:** İç limanlar geleneksel kıyı limanlarına yüksek kapasiteli demiryolu veya iç su yolu bağlantısı ile bağlı olan ve limanların hemen hemen tüm fonksiyonlarını iç bölgelerde yerine getiren lojistik kümelerdir. Bazı iç limanlar ana limanların uzaktaki kapısı şeklinde hizmet vermekte ve liman sahalarında ya da kapılarındaki sıkışıklığı iç bölgelerde yük kabul ederek veya dağıtarak ortadan kaldırmaktadır. İç limanlar tüm yük tiplerine hizmet vermektedir ve gümrükle ilgili tüm fonksiyonları da yerine getirmektedir. Bazı iç limanlar katma değerli lojistik hizmetleri de sunarak lojistik köyler ile benzerlik gösterebilirler. Ancak bu lojistik kümelerin temel amacı yüksek hacimli yük birleştirme ve aktarmalar sayesinde ana limanların operasyonel yoğunluğunu azaltmaktır.

**Lojistik Köy / (Merkez):** Lojistik merkez, ulaştırma ağı içerisinde bulunan ve farklı lojistik aktivitelerinin farklı operatörler ve hizmet sağlayıcılar aracılığıyla gerçekleştirildiği toplama ve dağıtım noktasıdır. Lojistik merkezler hakkında yapılan tanımlar arasında en sık vurgulanan özellikler değişik taşıma modlarına ve intermodal taşımaya uygun altyapı, tüm lojistik faaliyetlerini barındıran ve katma değer yaratan çoklu hizmet sunumu ve de bu farklı faaliyetlerin sağlayıcılarını koordine eden yönetimin şeklidir. Meidute'nin (2005) yapmış olduğu literatür taramasına göre, lojistik merkezleri tanımlarken ele alınan iki farklı bakış açısı

bulunmaktadır. Bunlardan birincisi merkezleri ulařtırma altyapısının bir parçası olarak görmekte iken ikincisi merkezlerle, verdiđikatma deđer yaratan hizmetler dolayısıyla bir iř üreticisi olarak yaklařmaktadır. Merkezler sahip oldukları intermodal terminaller ve büyük ölçekli lojistik hizmet üretim tesisleri ile ulařtırma altyapısını destekleyen yapılardır. Ayrıca tüm lojistik faaliyetlerinin tek noktada ancak çoklu operatörlerce yürütüldüđu lojistik merkezler lojistik sektörüne ve destekleyici diđer sektörlere geniş istihdam olanađı sađlamakta, bu sayede ekonomik gelişmeye de katkıda bulunmaktadır.

Bir lojistik kümenin lojistik köy olarak adlandırılabilmesi için bazı koşulları sađlaması gerekmektedir. Bunlar Avrupa Lojistik Köyler Platformu (EuroPlatforms) tarafından ařađıdaki gibi sıralanmaktadır:

- Lojistik köyler, serbest rekabet kurallarına uygun olarak, ilgili faaliyetleri yürütmekte olan tüm işletmelere açık olmalıdır.
- Lojistik köyler, sakinlerinin tüm lojistik hizmetlerini verebilmeleri için gerekli olan ve genel kullanıma açık altyapıya ve tesislere sahip olmalıdır.
- Lojistik köylerde birden fazla ulařtırma moduna ait altyapı ve terminal mutlaka bulunmalıdır. İntermodal taşımacılık lojistik köyler için en önemli gereksinimdir.
- Lojistik köyler, ticari işbirliğini sađlamak ve sinerjiden faydalanabilmek amacıyla, objektif, bađımsız bir yönetim tarafından ve tek elden yönetilmelidir. Bu yönetim tercihen kamu ve özel sektör ortaklıđından oluşabilir. Avrupa’da yer alan çođu lojistik köy kamu-özel sektör ortaklıđı tarafından yönetilmektedir.

### 1.1.3. Üçüncü Seviye Lojistik Kümeler

Bu seviyede tek grup altında **ana terminaller** yer almaktadır. Ana kapı, kıtalararası ölçekteki limanlar, havalimanları, dökme yük limanları, lojistik üsler bu seviye altında yer alan diđer lojistik küme çeřitleridir. Ana terminaller küresel lojistik sistemler dahilinde, yüksek hacimli yük hareketi ve faaliyetini, hem kendi sınırları içinde hem de çevresinde gerçekleřtiren lojistik kümelerdir. Bu seviyede havayolu veya denizyolu ile gelen yükler iç taşıma sistemlerine aktarılmakta veya iç

taşıma sistemlerinden gelen yükler dünyadaki nihai varış noktalarına doğru yolculuğa hazırlanmaktadır.

En büyük lojistik kümelenme çeşidi olan ana terminaller, yüksek oranda altyapı yatırımı gerektirmekte ve terminal operasyonlarını gerçekleştirebilmek için geniş ölçekli arazi ihtiyacı duymaktadır. Bu grupta yer alan tesisler bölgelerin ekonomik kalkınmalarına direkt olarak etki etmekte ve istihdam olanağı sağlamaktadır. Ana terminaller küresel tedarik zincirlerini birbirine bağlayan en önemli düğüm noktalarıdır.

Tüm bu lojistik kümelenme çeşitleri, aralarındaki temel farkların altını çizmek ve lojistik köylerin tüm lojistik kümeler arasındaki yerini anlamak amacıyla incelenmiştir. Lojistik köyler, lojistik kümeler arasında hiyerarşik olarak ana terminallerin bir altında yer almakta olan geniş ölçekli tesislerdir. Bu tesislerin rekabetçi gücü özellikle ana terminaller ile olan kuvvetli bağlantılar aracılığı ile sağlanmaktadır. Dünyada liman ve lojistik köy bağlantılarına dair çeşitli örnekler görülmektedir. Türkiye için geliştirilecek entegrasyon modeli politik mekanizma tarafından henüz belirlenmemişle birlikte, hali hazırda mevcut olan bağlantıların incelenmesi, Türkiye'deki lojistik köy yatırımları için önemli bir bilgi birikimi oluşturacaktır.

## **2.1. Lojistik Kümeler ve Liman Entegrasyonu**

Kuru limanlar gibi iç bölgelerde kıyı limanlarına alternatif olarak faaliyet gösteren tesislerin kurulma sebebi, özellikle denize kıyısı olmayan ülkelerin küresel ticarete bağlanması ilkesiyle açıklanmaktadır. Ancak ana limanların zaman içinde çeşitli sebeplerle etkinliklerini yitirmeleri sonucu iç limanlar yeni birer yük kaynağı olarak algılanmaya başlanmıştır (Wilmsmeier vd., 2011a). Özellikle yeni kuşak limanlarda küresel tedarik zincirlerinin ve ulaştırma ağlarının öneminin anlaşılmasını takiben paydaşların beklentileri ön plana geçmiştir (Notteboom ve Rodrigue, 2006). Hat operatörleri, armatörler, ihracatçılar, ithalatçılar, lojistik hizmet sağlayıcılar gibi paydaşların beklentilerine göre kendi hizmet kriterlerini revize etmiş ve toplam lojistik performansına daha çok önem vermeye başlamışlardır. Böylece liman gelişimindeki yeni evre olan “limanların bölgeselleşmesi” aşamasına geçilmiştir.

Mega armatörlerin ve ana limanların lojistik faaliyetlere yönelik ilgisi, limanların mümkün olan en geniş hinterlandı kapsamayı hedefleyen girişimlerde bulunmasına yol açmıştır.

İç limanların ana limanlarla entegrasyonu iki farklı şekilde meydana gelmektedir (Wilmsmeier vd., 2011b). *İçeriden dışarıya doğru entegrasyon*, bir iç limanın iç bölgede faaliyet gösteren bir aktör tarafından (devlet, demiryolu operatörü, karayolu ulaştırma hizmet sağlayıcı, denize kıyısı olmayan bölgelerin yerel yönetimleri vb.) geliştirilmesi ve kendisinin dış dünyaya açılmasını sağlayacak bir ana liman ile işbirliğine yönelmesi ile oluşmaktadır. *Dışarıdan içeriye doğru entegrasyon* ise, bir liman işletmesinin veya hat operatörünün bir iç liman geliştirmesi ve kıyı faaliyetlerini bu alandaki faaliyetler ile entegre etmesidir. Örneğin Hollanda'daki Rotterdam liman operatörü ECT, Venlo, Duisburg ve Willebroek iç limanlarını satın alarak dışarıdan içeriye doğru entegrasyon stratejisine bir örnek teşkil etmiştir. Diğer taraftan, İsveç'te bulunan Falköping iç terminali yerel kamu otoriteleri tarafından işletmeye açılmış ve daha sonra Göteborg limanı ile entegre edilerek içeriden dışarıya doğru entegrasyona örnek olmuştur (Monios ve Wilmsmeier, 2011). Ng ve Çetin'e (2012) göre içeriden dışarıya doğru entegrasyon stratejisi sıklıkla, gelişmekte olan ülkelerde görülmektedir. Bunun nedeni bu stratejinin altında yatan bölgesel kalkınma ve istihdam temelli kamu faydası gereği, gelişmekte olan ülkelerde iç limanlara yapılan kamu yatırımlarıdır. Türkiye'de limanlar tarafından iç bölgelere kurulmuş bazı konteyner sahaları bulunmakta olmasına karşın, lojistik köy yatırımlarının büyük oranda iç bölge aktörlerinden gelmesi bu öneriyi desteklemektedir.

## **2. TÜRKİYE’DE KURULACAK BİR LOJİSTİK MERKEZDE VERİLECEK HİZMET İÇİN MÜŞTERİ BEKLENTİLERİNİN BELİRLENMESİ VE ÖNCELİKLENDİRİLMESİ**

Literatürde yer alan ve lojistik merkezler üzerine yapılmış olan çalışmaların büyük çoğunluğu kavramsallaştırma odaklı, sınıflandırma sistemlerini inceleyen çalışmalardır. Sıklıkla görülen bir başka araştırma alanı ise lojistik merkezler için yer seçimi çalışmalarından oluşmaktadır. Ancak literatürde pazarlama teorisinden yola çıkarak, lojistik merkez hizmetlerini lojistik endüstrisinde faaliyet gösteren müşterilerin beklentilerini karşılamak amacıyla sunulan hizmetler olarak inceleyen ve tasarlayan herhangi bir çalışmaya rastlanmamıştır. Lojistik merkezler, altyapılarının yüksek yatırım bedelleri sebebiyle, ağırlıklı olarak kamu yatırıma gereksinim duysalar da, etkinlik, rekabetçi hizmet, ekonomik fayda, istihdam gibi amaçlara ulaşabilmeleri için özel sektör stratejileri doğrultusunda bir yönetim şeklini benimsemelilerdir. Bu amaçlara ulaşabilmek için öncelikle lojistik merkez hizmetinin müşterileri tanımlanmalı, onların istekleri dinlenmeli ve hizmet sunumu müşterilerin beklentilerine göre tasarlanmalıdır.

### **2.1. Müşteri Beklentilerinin Belirlenmesi**

Bu çalışmada müşteri beklentilerinin belirlenmesi için keşifsel bazı araştırma yöntemleri kullanılmış ve lojistik merkezlerin potansiyel müşterilerinin bir lojistik merkezden yer ya da hizmet satın almak için hangi kriterleri önemsedikleri analiz edilmiştir. Dünyadaki lojistik merkezlerden bazıları incelendiğinde, intermodal terminal operatörlerinden lojistik hizmet sağlayıcılara, büyük perakendecilerden tamir bakım gibi destek hizmet sağlayıcılara kadar çok farklı işletmenin bir arada faaliyetlerini sürdürdükleri gözlenmiştir. Türkiye’de kurulacak bir lojistik merkezden beklenecek hizmet kriterlerini belirlemek için de öncelikle bir odak grup çalışması yapılarak farklı işletme temsilcileri bir araya getirilmiş ve beklentilerini aktarmaları istenmiştir. Odak grup oturumunda meydana çıkan kriterler daha geniş ölçekli olarak bir içerik analizi çalışması ile incelenmiştir. Sektör dernekleri olan UND, UTIKAD, LODER, Deniz Ticaret Odası ve Mersin Deniz Ticaret Odası’nın yayınladığı dergiler

taranarak sektör yayınlarında lojistik köylerle ilgili makaleler içinde en çok tekrarlanan ve önemsenen hizmet kriterleri ortaya çıkarılmıştır. Bu analizi takiben beş derneğin temsilcileri ile bire bir görüşmeler yapılarak sonuçlar teyit edilmiştir. Ayrıca İtalya Verona ve Almanya Bremen lojistik köylerinin yöneticileri ile de bire bir görüşmeler yapılarak farklı uygulamalar ile Türkiye’de hizmet beklentileri karşılaştırılmıştır. Tüm bu nitel çalışmaların sonuçları Tablo A2.1.’de özetlenmiştir.

**Tablo A2.1.** Nitel Araştırma Sonuçları

| Araştırma Yöntemi                | Örneklem                                                                                                                                                                                                                                                           | Çıktılar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Odak Grup                        | 6 kişi<br><br>(ihracat yöneticisi, depo yöneticisi, kara nakliye yöneticisi, TCDD temsilcisi, liman yöneticisi, gemi acente yöneticisi)                                                                                                                            | -Müşteri beklentileri listelenmiştir. En sık tekrarlanan beklentiler demiryolu ve intermodal terminal, liman entegrasyonu, tek noktadan alışveriş olanağı, yönetim zihniyeti, yatırım maliyeti, telekommunikasyon altyapısı, depolar, TIR parkı, gümrük ve sosyal tesislerdir.<br><br>-Katılımcılar özellikle devletin altyapıyı kurduktan sonra yönetime müdahale etmemesi gerektiğini, devlet yönetiminin lojistik sektörünün ihtiyaç duyduğu hızı sektöre uğratacağını belirtmiştir. Lojistik köylerden beklenen verimin alınabilmesi için bu sektör dahilinde hızlı karar verebilecek bir “Koordinatör Bakan” mevkisinin kurulması önerilmiştir. |
| İçerik Analizi                   | 142 makale                                                                                                                                                                                                                                                         | -En sık tekrarlanan terimler: demiryolları, deniz ulaştırma, rekabet, gümrük, maliyet avantajı, depo yönetimi ve devlet yaklaşımı<br><br>-Odak grup sonuçlarını doğrulamıştır.<br><br>-Lojistik sektörünü temsil eden kuruluşların görüşlerini temsil etmektedir.                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. Görüşme                       | 5 kişi<br><br>(aşağıdaki kurumları temsilen<br>1- UND – UND’nin Sesi Dergisi<br>2- UTIKAD – UTA Lojistik Dergisi<br>3- LODER – Lojistik Dergisi<br>4- Deniz Ticaret Odası– Deniz Ticareti Dergisi<br>5- MersinDeniz Ticaret Odası – Mersin Deniz Ticareti Dergisi) | -Çıkan boyutlar içerik analizi sonuçları ile bağlantılı. En çok vurgulananlar: ölçek ekonomisi, hız, entegrasyon, demiryolu altyapısı, lojistik kümelenme, rekabet<br><br>-Ek olarak ortaya çıkan bir boyut: Güvenlik                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2. Görüşme: Verona Lojistik Köyü | 1                                                                                                                                                                                                                                                                  | -İtalya’da lojistik köyler ve hizmetleri yasa ile tanımlanmıştır.<br><br>-Lojistik köy kamu ve özel sektörü temsil eden üyelerin yer aldığı bir yönetim kurulu tarafından tek elden yönetilmektedir.<br><br>-Bilgi iletişim teknolojisi, bakım ve onarım gibi bazı hizmetler lojistik köy yönetim şirketi tarafından sunulmaktadır.<br><br>-Lojistik köyü bir emlak geliştirme şirketi olarak görmektedirler. Lojistik köy istendiği şekilde depolar veya terminaller geliştirmekte ve daha sonra bunları                                                                                                                                            |

|                                        |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |   | işletmelere uzun dönemli kiralamaktadır.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2. Görüşme:<br>Bremen Lojistik<br>Köyü | 1 | <p>-Almanya'daki lojistik köyler bir derneğe bağlıdır. Günlük yönetimleri bağımsızdır ancak stratejik adımlarda dernek tarafından koordine edilmektedirler.</p> <p>-Her lojistik köyde bir Lojistik Köy Geliştirme Şirketi kurulmuştur ve bu şirket lojistik köy sakinlerine pazarlama, inovasyon, çözüm geliştirme gibi bazı profesyonel hizmetler sunmaktadır.</p> <p>-Lojistik köylerde yatırımlar devlet eliyle yapılmaktadır ancak yönetim tamamen özel ve bağımsız şirketlere aittir. Lojistik köy yönetimi içeride verilen hiçbir hizmete karışmamaktadır. Hepsi ayrı şirketlerce yönetilmektedir. Lojistik köyler Almanya'nın makro ulaştırma ve kalkınma stratejilerinin önemli bir parçasıdır.</p> <p>-Lojistik köy sakinleri arazileri kiralamamakta, daha çok satın almaktadırlar.</p> |

Nitel araştırmaların sonucunda potansiyel müşterilerin lojistik köylerden temel beklentileri ortaya çıkarılmıştır. Bilindiği üzere, lojistik köy her ne kadar bir lojistik hizmet üreticisi olsa da bu hizmeti sunmak için oldukça somut ve görünür bir altyapıdan faydalanmaktadır. O sebeple hizmet kriterleri somut bileşenler ile soyut bileşenler olarak iki ayrı gruba ayrılmıştır. Somut bileşenler altyapı veya üstyapı öğelerini simgelemekte, soyut bileşenler ise tek noktadan alışveriş, tamir-bakım, anlaşmazlık çözümü gibi bazı profesyonel hizmetleri kapsamaktadır. Nitel araştırma sonuçları, Türkiye'de faaliyet gösteren lojistik hizmet sağlayıcıların görüşlerini genelleylebilmek ve lojistik merkezlerden yer ya da hizmet satın alma davranışlarını açıklayabilmek amacıyla, çalışmanın bir sonraki aşaması olan nicel araştırma sürecine girdi oluşturmuştur.

## 2.2. Müşteri Beklentileri ve Hizmet Kriterlerinin Sınıflandırılması

Nitel araştırma sonuçlarını genelleylebilmek için yapılacak olan nicel araştırma sürecinde, lojistik merkezlerin potansiyel müşterileri olarak lojistik hizmet sağlayıcılar seçilmiştir. Türkiye'de faaliyet gösteren lojistik hizmet sağlayıcıları temsilen UTIKAD üyeleri araştırmanın örneklemi oluşturmuştur. UTIKAD'ın web sayfasında yayınladığı üye listesine geliştirilen soru formu e-posta yolu ile iletilmiştir. 382 üyenin 35'ine çeşitli sebeplerle ulaşılammıştır. Ulaşılan üyelere 81'i soru formunu doldurarak araştırmaya katılmıştır. Soru formunda yer alan farklı bölümler istatistiksel olarak analiz edilmiştir.

Soru formunda yer alan müşteri beklentileri, kümelenme teorisi ve lojistik merkez literatüründen çıkarılan maddelerin, nitel araştırma süreçlerinden çıkan

sonuçlar ile birleştirilmesinden oluşturulmuştur. Hizmet kriterleri de nitel araştırma sonucu ortaya çıkan özellikler somut ve soyut adıyla iki ayrı grupta toplanarak listelenmiştir. Lojistik merkezlere yönelik genel eğilimi ölçmek amacıyla rekabete, yönetim şekline, satın alma davranışına dair çeşitli sorular geliştirilerek katılımcılara iletilmiştir. Bu sorulara verilen yanıtlardan ortalama değeri ilk üçte ve son üç sırada yer alanlar Tablo A2.2.'de listelenmiştir.

**Tablo A2.2.**Ortalama Değerler

| Anket Bölümü     | İlk Üç İfade                                                                               | Son Üç İfade                                                                                                 |
|------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Genel Eğilim     | Çalıştığım şirkete göre, lojistik merkez özel sektör tarafından yönetilmelidir.            | Çalıştığım şirket kurulacak olan lojistik merkezde rakipleriyle aynı yerde bulunmak istemez.                 |
|                  | Çalıştığım şirkete göre, bulunduğumuz bölgede bir lojistik merkez kurulması gerekmektedir. | Çalıştığım şirket, lojistik merkezin kurulmasıyla tüm operasyonlarını ve tesislerini bu alana kaydıracaktır. |
|                  | Çalıştığım şirket kurulacak olan lojistik merkezden hizmet alacaktır.                      | Çalıştığım şirkete göre, lojistik merkez devlet tarafından yönetilmelidir.                                   |
| Somut Bileşenler | Intermodal terminal                                                                        | Oteller                                                                                                      |
|                  | Bilgi teknolojisi altyapısı                                                                | Üniversite araştırma birimleri                                                                               |
|                  | Kara-demiryolu arayüzü                                                                     | Kütüphane                                                                                                    |
| Soyut Bileşenler | Tek noktadan hizmet alabilme                                                               | Bakım ve onarım hizmetleri                                                                                   |
|                  | Güvenlik hizmetleri                                                                        | Çatışma çözümü hizmetleri                                                                                    |
|                  | Emniyet hizmetleri                                                                         | Emlak geliştirme, satış ve kiralama hizmetleri                                                               |

Ortalama değerlerin tamamı ve Tablo A2.2. incelendiğinde, Türkiye’de faaliyet gösteren lojistik hizmet sağlayıcıların, kurulacak olan lojistik köyde yönetimin kesinlikle özel sektör tarafından yürütülmesini istedikleri görülmektedir. Avrupa’da yaygın olan kamu-özel sektör ortaklığı, araştırmaya katılan şirketlerce benimsenmemiştir. Lojistik merkezlerin kurulması sektör tarafından da gerekli görülmektedir ve beklentileri karşılayan lojistik merkezler kurulması halinde lojistik firmalarının bu tesislerden hizmet alma eğilimi olduğunu söylenebilmektedir. Ancak lojistik merkezler kurulur kurulmaz firmaların tüm faaliyetlerini bu alanlara kaydırılması beklenmemektedir. Yoğun bir talebin başlaması için öncelikle pazar lideri firmaların ve büyük ölçekli ithalatçı veya ihracatçıların bu alanlarda konumlanması gerekmektedir.

Bir diğer ilginç sonuç rakip firmalarla coğrafi olarak aynı yerde bulunma konusunda gözlemlenmiştir. Nitel araştırmalar sırasında araştırmaya katılanlar bu konuda çoklukla tereddütlerini belirtmişlerdir. Türkiye’de lojistik sektörü henüz Avrupa veya ABD ölçeğinde değildir. Lojistik hizmet sağlayıcı seçiminde fiyat hala en önemli kriterlerden birini oluşturmaktadır. Sektör içi rekabet hizmet

çeşitlendirmesi veya komple çözüm sunma kapasitesinden daha çok fiyata dayalı olarak yürümektedir. Bu nedenle, lojistik hizmet sağlayıcılar rakipleriyle aynı noktada yer alırlarsa, mevcut müşteri portföylerinin görünürlüğünün artacağından ve pazar paylarında kayba uğrayacaklarından çekinmektedir. Ancak anket sonuçlarına bu çekince yansımamış ve katılımcı firmaların yanıtlarının ortalaması rakipleriyle bir arada olmaktan rahatsızlık duymayacaklarını göstermiştir. Yine de lojistik merkez hizmetleri tasarlanırken bu konuya dikkat edilmeli ve şirketlerin bu konudaki hassasiyetleri göz önünde bulundurulmalıdır. Sektör güçlendikçe firmalar da bir arada bulunarak geliştirebilecekleri yeni iş olanaklarını ve görev çevrelerini etkileyebilme güçlerinin arttığını fark etmeye başlayacaklardır.

Nicel araştırmanın bu bölümünde ortalamaların incelenmesinin yanı sıra, uzun listeler halinde yanıtlanan müşteri beklentileri ve hizmet kriterlerinin alt boyutlarının gruplandırılabilmesi için keşifsel faktör analizi uygulanmıştır. Faktör analizi sonucunda müşteri beklentileri (1) rekabet avantajı, (2) verimlilik ve yanıt verebilirlik, (3) işbirliği ve güven, (4) sürdürülebilirlik adı verilen dört boyutta toplanmıştır. Lojistik hizmet sağlayıcılar, bir lojistik merkezde yer alarak bu dört ana boyutta çeşitli avantajlar sağlayabileceklerini düşünmektedir.

Lojistik merkez tarafından sunulacak olan endüstriyel hizmetin somut bileşenleri beş farklı boyutta, soyut bileşenleri ise iki farklı boyutta toplanmıştır. Bu boyutlar ve altlarında yer alan hizmet kriterleri Tablo A2.3.'de gösterilmektedir.

**Tablo A2.3.**Somut ve Soyut Hizmet Bileşenleri

| SOMUT BİLEŞENLER                                        |                             |                                               |                     |                     | SOYUT BİLEŞENLER                                             |                                                  |
|---------------------------------------------------------|-----------------------------|-----------------------------------------------|---------------------|---------------------|--------------------------------------------------------------|--------------------------------------------------|
| Destek Hizmetler                                        | Temel Altyapı               | Depo & Intermodal                             | İkincil Destekler   | Özel Depolama       | Katma Değerli Hizmetler                                      | Standart Hizmetler                               |
| Çağrı Merkezi                                           | Kara-Demiryolu bağlantısı   | Parsiyel yükler için konsolidasyon merkezleri | Benzin istasyonları | Dökme yük sahaları  | Lojistik merkez pazarlama hizmeti                            | Emniyet hizmeti                                  |
| Oteller                                                 | Liman bağlantısı            | Antrepolar                                    | Çalışma ofisleri    | Tanklar             | Tedarik zinciri çözümleri                                    | Güvenlik hizmeti                                 |
| Restoranlar                                             | Bilgi teknolojisi altyapısı | Açık depolama alanları                        | TIR Parkları        | Soğuk hava depoları | Kalite ve performans geliştirme hizmetleri                   | Bilgi teknolojisi hizmetleri                     |
| Kütüphane                                               | Enerji altyapısı            | İntermodal terminal                           | Postane             |                     | Danışma ve çözüm geliştirme hizmetleri                       | Bakım onarım hizmetleri                          |
| Afet Yönetim Merkezi                                    | Gümrük ofisleri             | Standart depolar                              | Güvenlik binaları   |                     | Paketleme, etiketleme gibi katma değerli lojistik hizmetleri | Emlak geliştirme, satış veya kiralama hizmetleri |
| Üniversite Araştırma Birimleri                          |                             | Konteyner sahası                              |                     |                     | Çatışma çözümü hizmetleri                                    |                                                  |
| Ticaret Odası veya İhracatçı Birlikleri gibi kuruluşlar |                             |                                               |                     |                     | Tek noktadan hizmet alabilme olanağı                         |                                                  |

### 2.3. Satın Alma Davranışını Etkileyen Faktörler

Müşteri beklentileri ve hizmet kriterlerinin sınıflandırılmasını takiben, potansiyel müşterilerin lojistik merkezlerden yer veya hizmet satın alma davranışlarını etkileyen faktörler açıklanmaya çalışılmıştır. Bu analizler sonucunda “Hangi müşteri beklentileri satın alma eğilimini daha yüksek oranda açıklamaktadır?” sorusuna yanıt aranmıştır. Sonuçlar Tablo A2.4.’te gösterilmektedir.

**Tablo A2.4.** Satın Almayı Etkileyen Faktörler

| <b>Regresyon Analizi</b>                                                          | <b>Değişkenler</b>               | <b>Açıklama Gücü</b>  |
|-----------------------------------------------------------------------------------|----------------------------------|-----------------------|
| Müşteri Beklentileri ve Genel Satın Alma Eğilimi                                  | Rekabet Üstünlüğü                | % 26                  |
|                                                                                   | Etkinlik ve Yanıt Verebilirlik   | % 39                  |
|                                                                                   | İşbirliği ve Güven               | % 21                  |
|                                                                                   | Sürdürülebilirlik                | İlişki Yok            |
| Müşteri Beklentileri ve Lojistik Merkezlerden Arazi ya da Bina Satın Alma Eğilimi | Rekabet Üstünlüğü                | % 24                  |
|                                                                                   | Etkinlik ve Yanıt Verebilirlik   | % 33                  |
|                                                                                   | İşbirliği ve Güven               | İlişki Yok            |
|                                                                                   | Sürdürülebilirlik                | İlişki Yok            |
| Müşteri Beklentileri ve Lojistik Merkezlerden Hizmet Satın Alma Eğilimi           | Rekabet Üstünlüğü                | % 39                  |
|                                                                                   | Etkinlik ve Yanıt Verebilirlik   | % 38                  |
|                                                                                   | İşbirliği ve Güven               | % 19                  |
|                                                                                   | Sürdürülebilirlik                | İlişki Yok            |
| Müşteri Beklentileri ve Lojistik Merkezlere Yatırım Yapma Eğilimi                 | Rekabet Üstünlüğü                | İlişki Yok            |
|                                                                                   | Etkinlik ve Yanıt Verebilirlik   | %29                   |
|                                                                                   | İşbirliği ve Güven               | İlişki Yok            |
|                                                                                   | Sürdürülebilirlik                | İlişki Yok            |
| Makro, Mikro ve Örgütsel Değişkenler ile Satın Alma Kararı arasındaki ilişki      | Sadece iki değişken anlamlı      |                       |
|                                                                                   | Makro Çevre                      | 0,281 (Negatif Etki)  |
|                                                                                   | Satın Alma Merkezinin Etkileşimi | 26,073 (Pozitif Etki) |

Tablo incelendiğinde müşteri beklentilerinin dört boyutundan üçünün, lojistik merkezlerden genel satın alma eğilimini pozitif şekilde etkilediği görülmektedir. Lojistik hizmet sağlayıcıların bir lojistik merkezde yer alarak rekabet üstünlüğü sağlayabileceklerine, etkinliklerini ve yanıt verebilirliklerini artıracaklarına ve lojistik merkez üyeleri arasında işbirliği ve güvenin tesis edileceğine dair inançları arttıkça, lojistik merkezlerden satın alma eğilimleri de artacaktır. Burada en yüksek açıklama gücüne sahip değişkenin etkinlik ve yanıt verebilirlik değişkeni olduğu görülmektedir. Bu da sektördeki maliyet baskısı ve değişken talep ile açıklanabilir. Lojistik hizmet sağlayıcıları lojistik merkezlere çekmek isteyen yatırımcıların, bu potansiyel müşterileri lojistik merkezlere katılarak daha az maliyetle daha yüksek çıktılar elde edeceklerine ve müşterilerin değişken taleplerine daha hızlı yanıt verebileceklerine ikna etmesi gerekmektedir.

Etkinlik ve yanıt verebilirlik değişkeninin genel satın alma davranışı haricinde ayrıca tek tek arazi ya da bina satın alma, hizmet satın alma ve yatırım yapma davranışlarına da etki ettiği görülmektedir. Bu da hem ölçek ekonomisinden yararlanarak maliyet avantajı yaratmanın, hem de hizmet üstünlüğü sağlayarak

müşterilere hızlı yanıt verme olanağı sağlamanın lojistik merkezlerin sunacağı hizmet açısından en öncelikli kriterler olduğunu göstermektedir. Etkinlik ve yanıt verebilirliğin yanı sıra rekabet üstünlüğü ve işbirliği-güven gibi değişkenler, farklı satın alma davranışlarında da etkili olabilmektedir. Ancak sürdürülebilirlik ile ilgili beklentilerin hiçbir satın alma davranışına etki etmediği gözlemlenmiştir. Bu da, lojistik merkezlerin, lojistik hizmet sağlayıcılar tarafından henüz çevresel, ekonomik veya sosyal sürdürülebilirlik açısından bir çözüm olarak görülmediği şeklinde yorumlanabilir.

Çalışmada lojistik hizmet sağlayıcıların mikro düzeydeki beklentilerinin haricinde, ayrıca makro çevre, görev çevresi ve örgüt içi çevresel değişkenlerin nihai satın alma kararına etkileri de incelenmiştir. Varılan sonuçlara göre sadece iki değişken, lojistik hizmet sağlayıcıların nihai satın alma kararlarını açıklamaktadır. Bunlardan ekonomik çevre, sosyo-kültürel çevre, yasal-politik çevre, doğal çevre gibi makro çevre değişkenleri ile nihai satın alma kararı arasında negatif yönlü bir ilişki olduğu görülmüştür. Bu sonuca göre makro çevredeki değişkenlik oranının fazla, ekonomik çevre veya politik çevre gibi alt makro çevre boyutlarındaki karmaşıklık durumunun yüksek olduğu ortamlarda, lojistik hizmet sağlayıcıların lojistik merkezlere dair nihai satın alma kararları olumsuz yönde değişiklik gösterebilecektir. Lojistik merkezlerden yapılacak satın almayı olumlu yönde düzenlemek için öncelikle dengeli ve istikrarlı bir makro çevre düzenine ihtiyaç vardır. Ekonomik krizler, yasa değişiklikleri, politik belirsizlikler satın alma davranışını olumsuz yönde etkilemektedir.

Nihai satın alma kararını olumlu yönde etkileyen değişken ise satın alma merkezinin etkileşimidir. Satın alma merkezi, bir lojistik hizmet sağlayıcıda görev yapan ve lojistik merkezlerden yapılacak satın almalara karar veren ekibin tamamına verilen isimdir. Burada karara etki eden her çalışan bu merkezin bir üyesidir. Satın alma merkezinde yer alan üyeler arasındaki etkileşimin yoğunluğu arttıkça, nihai satın alma kararının olumlu yönde değişmesi beklenmektedir. Bu da üyeler arası bilgi paylaşımı ve olumlu geri bildirimlerin, satın almayı olumlu yönde etkilediğini göstermektedir.

## 2.4. Lojistik Merkez Hizmet Kriterlerinin Önceliklendirilmesi

Tüm bu analizler sonucunda elde edilen veriler, kalite fonksiyon göçerimi adı verilen ve müşteri beklentilerini teknik ürün veya hizmet boyutları cinsine tercüme ederek öncelik verilmesi gereken hizmet kriterlerini belirleyen yöntem kullanılarak incelenmiştir. Tablo A2.3.'te detayları listelenen hizmet boyutları, müşteri beklentilerine ve müşterilerin her birine atadıkları önem derecelerine göre önceliklendirilmiştir. Tablo A2.5.'te verilen nihai puanlara göre müşteriler için en öncelikli olan hizmet boyutları somut bileşenlerden temel altyapı ile depo ve intermodal hizmet bileşenleridir. Lojistik merkez hizmetlerinin verilmesine aracılık edecek olan bu iki bileşen ve altlarında yer alan tüm değişkenler, lojistik hizmet sağlayıcılar için en önemli hizmet kriterleridir.

**Tablo A2.5.** Hizmet Kriterlerinin Önceliklendirilmesi

| SOMUT BİLEŞENLER |               |                   |                   |               | SOYUT BİLEŞENLER        |                    |
|------------------|---------------|-------------------|-------------------|---------------|-------------------------|--------------------|
| Destek Hizmetler | Temel Altyapı | Depo & Intermodal | İkincil Destekler | Özel Depolama | Katma Değerli Hizmetler | Standart Hizmetler |
| 1,359            | 2,035         | 2,035             | 1,6               | 1,3           | 1,80                    | 1,73               |

Bu iki temel kriteri takiben lojistik hizmet sağlayıcılar, lojistik merkezler aracılığıyla verilecek lojistik hizmetin farklılaştırılmasını beklemektedir. Katılımcılar, paketleme, etiketleme, komple tedarik zinciri çözümleri, çatışma yönetimi, inovasyon danışmanlığı gibi katma değerli hizmetlerin önemli bir hizmet kriteri oluşturduğunu düşünmektedirler. Ayrıca standart hizmet kalemleri olan güvenlik, emniyet, bakım-onarım, bilgi teknolojisi gibi hizmetler de öncelikli olarak verilmesi gereken hizmetler arasında yer almaktadır. Destek hizmetleri ve özel depolama gibi bileşenler ise lojistik merkezlerin kuruluş aşamasında değil, ancak temel altyapının işler hale gelmesini takiben yatırım yapılması gereken alanlardır. Lojistik merkez girişimcileri bu öncelik sırasına göre yapacakları yatırımları şekillendirebilir ve kıt finansal kaynakları öncelikli alanlarda değerlendirebilirler.

## SONUÇ

Bu araştırmanın sonucunda, Türkiye’de faaliyet gösteren lojistik hizmet sağlayıcılar gözüyle lojistik merkezler kapsamlı bir şekilde değerlendirilmiştir. Araştırma bu konuda lojistik hizmet sağlayıcıların görüşlerine başvuran ilk çalışmalardan biri olarak literatüre müşteri odaklı bir yaklaşım ile katkıda bulunmaktadır. Alınan sonuçlar arasında en çarpıcı olanı lojistik merkezler ile ilgili yapılan girişimlerin lojistik hizmet sağlayıcılara ve sektöre yeterli ölçekte aktarılamadığı çıkarımıdır. Araştırmaya katılan şirket temsilcilerinin lojistik merkezler hakkında bilgi sahibi olup olmadıklarına yönelik sorulara verdikleri yanıtlar oldukça düşük ortalama değerlere sahiptir. Bu tesislerin potansiyel müşterilerini gelecekte kazanabilmek için öncelikle lojistik merkez kavramı, faydaları, planlanan hizmetler kendileriyle paylaşılmalıdır. Lojistik hizmet sağlayıcılar, lojistik merkez girişimleri ile ilgili bilgilendirilmeli ve tereddütleri giderilmelidir.

Türkiye gibi lojistik sektörünün henüz temel lojistik faaliyetler ölçeğinde çalıştığı, komple lojistik çözümler veya tedarik zinciri yönetimi hizmetleri gibi kapsamlı pazar sunumlarına alışkın olmayan ülkeler için lojistik hizmet sağlayıcıların müşterileri olan ihracatçı, ithalatçı ve perakendeci firmalar da lojistik merkezler hakkında bilgilendirilmelidir. Müşterilerin talepleri, lojistik hizmet sağlayıcıları lojistik merkezlere katılma konusunda motive edecektir. Ayrıca rakiplerle aynı yerde bulunmaktan kaynaklanan çekinceleri de zaman içinde ortadan kaldıracaktır.

Lojistik merkezlerin en önemli maliyet faydası olarak görülen ölçek ekonomisinin sağlanabilmesi için, lojistik hizmet sağlayıcıların işbirliğine ve örgütler arası güven ihtiyacı vardır. Ancak yüksek ölçekli hareketlerde avantaj sağlayabilecek olan demiryolu taşımacılığı ve intermodal terminallerin bu amaca yönelik olarak kullanılabilmesi için, farklı lojistik hizmet sağlayıcıların yüklerini birleştirerek altyapıdan etkin bir şekilde faydalanması gerekmektedir. Bu da ancak rekabet konusundaki çekincelerin giderilmesiyle başarılabilecektir.

Türkiye’de devlet eliyle başlatılmış olan lojistik köy girişimleri, hali hazırda, özel sektör firmaları tarafından benimsenmiş değildir. Özel sektör tarafından yapılan lojistik köy girişimlerinin ise, yatırımı yapan firmaya ait özel üslere dönüşeceğine

dair görüşler bulunmaktadır. Lojistik merkez yatırımcıları Avrupa veya ABD ölçeğinde lojistik merkezler kurma amaçlarına ulaşmak için öncelikle hizmetin ve tesislerin tasarımı sürecine potansiyel müşterilerin fikirleriyle katılımını sağlamalı ve pazar odaklı bir yaklaşım sergilemelidir. Müşteri beklentilerini karşılamayan, limanlar, havalimanları ve diğer çıkış kapıları ile entegre olamayan lojistik merkezler atıl yatırımlar olarak kalacaktır. Bölgesel fayda ve yük analizleri doğru yapılmadan, birbirine fazlasıyla yakın noktalarda kurulacak lojistik köyler birbirlerinin yük potansiyellerini hedefleyerek toplam faydanın düşmesine sebep olacaklardır. Özel sektörün hız ve güvenliği aynı anda isteyen talep yapısına uymayan yönetim zihniyetleri, lojistik hizmet sağlayıcıların lojistik merkezlere mesafeli bir duruş sergilemesine yol açacaktır.

Bu ve benzer sonuçlara engel olmak amacıyla, araştırmanın sonuçlarının sektör uygulayıcıları ve yasa yapıcıları tarafından dikkatle incelenmesi önerilmektedir. Endüstriyel müşteri odaklı benzer çalışmaların daha da geniş ölçeğe yayılarak tekrarlanması, sektörün görüşlerine farklı noktalarda tekrar başvurulması ve pazar beklentilerine yönelik tesisler ile hizmet sunumlarının tasarlanması lojistik merkez yatırımlarının geleceği için olumlu sonuçlar doğuracaktır.

## APPENDIX 3.Question Forms (English)

### (Questionnaire – QFD – Cost Analysis)

#### CUSTOMER EXPECTATIONS AND ORGANIZATIONAL BUYING FROM LOGISTICS CENTERS

##### PROFILE QUESTIONS:

- 1- Age : ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 ve üstü
- 2- Gender : ☐ Female ☐ Male
- 3- Occupation/Title :
- 4- Tenure at current workplace : Year(s) / Month(s)
- 5- Professional work experience : Year(s) / Month(s)
6. Number of employees : ☐ 1-9 ☐ 10-49 ☐ 50-250 ☐ >250
7. Establishment date/Headquarters : \_\_\_\_/\_\_\_\_
8. Any foreign partnership? : ☐ Yes (Foreign partnership share:%\_\_\_\_) ☐ No
9. Which of below activities does your company provide services? (You may check more than one option)
- ☐ Land Transport % ☐ Air Transport% ☐ Sea Transport % ☐ Rail Transport %
- ☐ Freight Forwarder % ☐ Intermodal Transport% ☐ Port Management % ☐ Warehousing %
- ☐ Other, Please specify %

#### I. General Questions (Please respond from the perspective of the company you work for)

|                                                                                                                              | 1: Completely disagree | 5: Completely agree | 1                        | 2                        | 3                        | 4                        | 5                        |
|------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. I have adequate information about logistics centers / freight villages.                                                   |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. According to my company, a logistics center is required to be established in the area that we are operating               |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. According to my company, adequate demand will arise towards a logistics center established in our area                    |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Our company will purchase land from this logistics center.                                                                |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Our company will buy services from this logistics center.                                                                 |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Our company does not want to be at the same point with its competitors in the logistics center.                           |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Our company will invest in this logistics center.                                                                         |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Our customers will want us to serve through this logistics center.                                                        |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Our company will invest in the logistics center by direct purchasing.                                                     |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Our company will invest in the logistics center by leasing.                                                              |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Our company will shift all of its operations to this area as soon as the logistics center is established.                |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Our company will make the first investments to the logistics center by shifting a part of its operations to this center. |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Our company is aware of the synergy advantage of locating together with its competitors and other related companies.     |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. According to our company, logistics centers have to be managed by a single body.                                         |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. According to our company, logistics centers have to be managed by the public authorities.                                |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. According to our company, municipalities should also take place in the management of logistics centers.                  |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. According to our company, logistics centers have to be managed by the private sector.                                    |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. According to our company, logistics centers have to be managed by public-private-partnership.                            |                        |                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**II. For the company that I work for below listed infrastructure characteristics are required to exist in a logistics center that is to be established around the area that we operate.**

| 1: Totally unimportant<br>5: Very important | 1 2 3 4 5                                                                                                                    | 1: Totally unimportant<br>5: Very important                   | 1 2 3 4 5                                                                                                                    |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Intermodal terminal                         | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Banks                                                         | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Standard warehouses                         | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Restaurants                                                   | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Bonded warehouses                           | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Hotels                                                        | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| TIR Parks                                   | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | University research units                                     | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Container yards                             | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Institutions like chamber of commerce, Exporters' Unions etc. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Maintenance and repair centers              | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Customs offices                                               | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Oil stations                                | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Seaport integration                                           | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Working offices                             | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Rail-road interface                                           | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Postal office                               | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Information technology infrastructure                         | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Security buildings                          | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Energy infrastructure                                         | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Library                                     | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | State institutions like ministries or management offices      | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Cold storage facilities                     | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Call center                                                   | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Tanks (for liquids)                         | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Disaster management center                                    | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Bulk cargo facilities                       | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Dangerous goods warehouse                                     | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Open warehouses                             | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Consolidation centers for part loads                          | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Other(s):                                   |                                                                                                                              | 1. _____<br>2. _____<br>3. _____                              |                                                                                                                              |

**III. A logistics center should provide below listed services to its investors according to the company I work for.**

| 1: Totally unimportant 5: Very important                     | 1 2 3 4 5                                                                                                                    |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| One-stop-shopping services                                   | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Maintenance and repair services                              | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Information and technology services                          | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Logistics center marketing services                          | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Counseling and solution development services                 | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Quality and performance development services                 | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Conflict resolution services                                 | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Real estate development, sales or rent services              | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Supply chain solution services                               | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Value added logistics services like packaging, labeling etc. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Safety services                                              | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Security services                                            | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| Other (s)                                                    | 1. _____<br>2. _____<br>3. _____                                                                                             |

III. The expectations of the company I work for are listed below.

| 1: Completely disagree                                                                                                  | 5: Completely agree | 1                                | 2                        | 3                        | 4                        | 5                        |
|-------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Will decrease our logistics costs.                                                                                   |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Will facilitate the development of intermodal transportation.                                                        |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Will let us utilize economies of scale.                                                                              |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Will support us in gaining new customers through common marketing strategies.                                        |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Will support us in reaching qualified human resources through common labor pools.                                    |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Will provide us specialized vendor source.                                                                           |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Will decrease our unit costs through the utilization of common transportation infrastructure.                        |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Will decrease our unit costs through the utilization of common energy infrastructure.                                |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Will decrease our unit costs through the utilization of common information technology infrastructure.                |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Will increase our flexibility and responsiveness.                                                                   |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Will increase our ability to adapt changes in business environment.                                                 |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Will increase our cooperation with ports or organized industrial zones.                                             |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Will increase our cooperation with companies similar with us within the logistics center.                           |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Will increase our cooperation with our suppliers within the logistics center.                                       |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Will increase information sharing within the logistics center.                                                      |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Will increase trust among companies within the logistics center.                                                    |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Will maintain proximity for inputs like labor, energy, information or expertise that we use for service production. |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Will maintain the spread of best practices among the companies located inside the logistics center.                 |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. The competition inside the logistics center will foster innovation.                                                 |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Will increase our service quality.                                                                                  |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. The synergy inside the logistics center will increase our impact over demand and supply markets.                    |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. The synergy inside the logistics center will increase our impact on political/legal environment.                    |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. The R&D institutions and university units within the logistics center will develop new logistics solutions.         |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Logistics center will provide opportunities to improve our market offerings to our industrial customers.            |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Logistics center will facilitate the economic growth in our region.                                                 |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Logistics center will facilitate the development of social environment in our region.                               |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Logistics center will decrease the negative impacts of logistics activity on natural environment.                   |                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other (s)                                                                                                               |                     | 1. _____<br>2. _____<br>3. _____ |                          |                          |                          |                          |

V. The factors that are influential on my company's intention to buy land or services from logistics centers.

I. Macro environment dimensions      1: Does not influence at all    5: Influences highly

|                      |   |                           |   |                            |   |
|----------------------|---|---------------------------|---|----------------------------|---|
| Natural Environment. | — | Legal Environment         | — | Political Environment      | — |
| Economic Environment | — | Technological Environment | — | Socio-cultural Environment | — |

## 2. Task environment dimensions

1: Does not influence at all 5: Influences highly

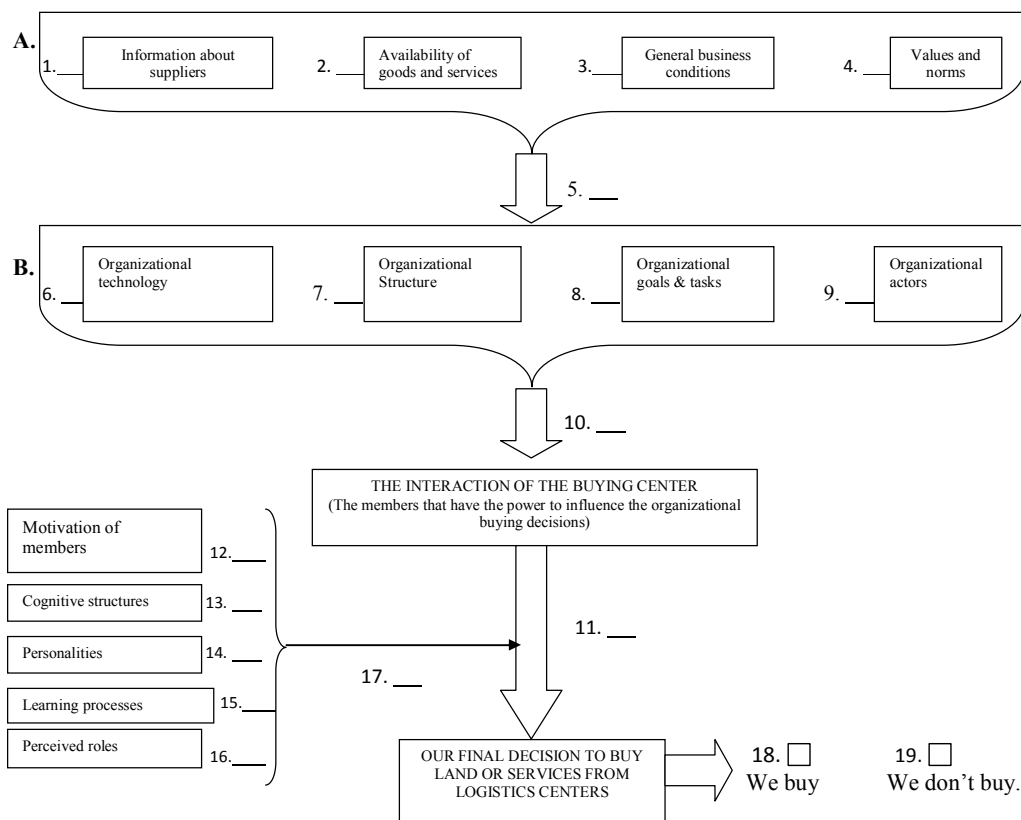
|           |   |                                |   |                                      |   |
|-----------|---|--------------------------------|---|--------------------------------------|---|
| Customers | — | Professional Occupation Groups | — | Other Social Organizations (NGOs...) | — |
| Suppliers | — |                                |   |                                      |   |
| State     | — | Other Organizations-Rivals     | — | Commercial Associations and Chambers | — |
| Unions    | — |                                |   |                                      |   |

3. Please fill out the boxes on the organizational buying model below by thinking the relationship between the variables that are related by given arrows. Please think your organizational buying process from logistics centers.

### A Group: Environmental determinants of buying behavior

### B Group: Organizational determinants of buying behavior

**Our organizational buying decision from logistics centers: 1: Not influenced at all 5: Influenced highly**



### QUESTION FORM I

1. Below you may find the customer expectations from a freight village on the rows and the technical characteristics of a freight village on the columns. Please state the power of the relationships between the customer expectations and technical characteristics by using the following scale. Strong: S for a strong relationship; Medium: M for a medium relationship; Weak: W for a weak relationship. (For example: If you think that there is a strong relationship between cooperation and trust and special warehousing then you may write an S to box 19.) If you think that there is no relationship between specific dimensions then you may leave the box empty.

|                                              |                                                                                                                                                      | TECHNICAL CHARACTERISTICS IN A FREIGHT VILLAGE                                                            |                                                                                                                                             |                                                                                                                                    |                                                                                                         |                                                                       |                                                                                                                                                           |                                                                                                                            |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                                              |                                                                                                                                                      | Supporting Infrastructure<br>(Call Center, Hotels, Restaurants, Library, University units, Chambers etc.) | Basic Infrastructure<br>(Land-rail integration, seport connection, customs offices, energu and information technology infrastructure etc. ) | Warehousing and Intermodal<br>(Intermodal terminal, standard warehouses, bonded warehouses, open warehouses, container yards etc.) | Secondary Supporters<br>(Oil stations, TIR parks, working offices, post office, security offices, etc.) | Special Warehousing<br>(Cold Storage, Tanks, Bulk Cargo Storage etc.) | Value-added Services<br>(Marketing services, Consulting and problem solving services, packaging, labeling and other VALS, one-stop-shopping services etc) | Standard Services<br>(Maintenance and Repair services, safety and security services, information technology services etc.) |
| CUSTOMER EXPECTATIONS FROM A FREIGHT VILLAGE | Competitive Advantage (ability to imfluence the environment, proximity to resources, proximity to vendor source, sybergy, innovation abilities etc.) | 1.                                                                                                        | 2.                                                                                                                                          | 3.                                                                                                                                 | 4.                                                                                                      | 5.                                                                    | 6.                                                                                                                                                        | 7.                                                                                                                         |
|                                              | Efficiency and Responsiveness (improvement of services, facilitation of intermodal transportation, decreasing logistics costs)                       | 8.                                                                                                        | 9.                                                                                                                                          | 10.                                                                                                                                | 11.                                                                                                     | 12.                                                                   | 13.                                                                                                                                                       | 14.                                                                                                                        |
|                                              | Cooperation and Trust (increased information sharing, trust and cooperation among resident companies)                                                | 15.                                                                                                       | 16.                                                                                                                                         | 17.                                                                                                                                | 18.                                                                                                     | 19.                                                                   | 20.                                                                                                                                                       | 21.                                                                                                                        |
|                                              | Sustainability (economic, social and environmental sustainability)                                                                                   | 22.                                                                                                       | 23.                                                                                                                                         | 24.                                                                                                                                | 25.                                                                                                     | 26.                                                                   | 27.                                                                                                                                                       | 28.                                                                                                                        |

2. Please respond to the below given three questions according to the scale exhibited on the table

- First question is asking your importance ranking for these customer expectations

- Second question is asking your ideas regarding the freight village's ability to meet these expectations

- Third question is asking your ideas regarding the independent individual facilities' abilities to meet these expectations (facilities outside the freight village)

|                                                                                                                                                      | 1. DEGREE OF IMPORTANCE                            | 2. THE PROBABILITY THAT FREIGHT VILLAGE MEETS THESE EXPECTATIONS | 3. THE PROBABILITY THAT 3PLS' OWN FACILITIES (OUTSIDE THE FREIGHT VILLAGE) MEET THESE EXPECTATIONS |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>CUSTOMER EXPECTATIONS</b>                                                                                                                         | VH: Very High<br>H: High<br>L: Low<br>VL: Very Low | VH: Very High<br>H: High<br>L: Low<br>VL: Very Low               | VH: Very High<br>H: High<br>L: Low<br>VL: Very Low                                                 |
| Competitive Advantage (ability to imfluence the environment, proximity to resources, proximity to vendor source, sybergy, innovation abilities etc.) |                                                    |                                                                  |                                                                                                    |
| Efficiency and Responsiveness (improvement of services, facilitation of intermodal transportation, decreasing logistics costs)                       |                                                    |                                                                  |                                                                                                    |
| Cooperation and Trust (increased information sharing, trust and cooperation among resident companies)                                                |                                                    |                                                                  |                                                                                                    |
| Sustainability (economic, social and environmental sustainability)                                                                                   |                                                    |                                                                  |                                                                                                    |

## COST ANALYSIS

1. Below you may find the technical characteristics of a freight village to be established in Turkey. These technical characteristics are grouped according to a prior survey study that was applied to 3PLs and 4PLs in Turkey. Please evaluate these groups of technical characteristics with VH, H, L, VL coding scheme that is given below, depending on the investment cost of the related group.

|                                                                                                          | TECHNICAL CHARACTERISTICS IN A FREIGHT VILLAGE                                                            |                                                                                                                                             |                                                                                                                                    |                                                                                                         |                                                                        |                                                                                                                                                           |                                                                                                                            |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                                                                                                          | Supporting Infrastructure<br>(Call Center, Hotels, Restaurants, Library, University units, Chambers etc.) | Basic Infrastructure<br>(Land-rail integration, seport connection, customs offices, energu and information technology infrastructure etc. ) | Warehousing and Intermodal<br>(Intermodal terminal, standard warehouses, bonded warehouses, open warehouses, container yards etc.) | Secondary Supporters<br>(Oil stations, TIR parks, working offices, post office, security offices, etc.) | Special Warehousing<br>(Cold Storage, Tanks, Bulk Cargo Storage etc. ) | Value-added Services<br>(Marketing services, Consulting and problem solving services, packaging, labeling and other VALS, one-stop-shopping services etc) | Standard Services<br>(Maintenance and Repair services, safety and security services, information technology services etc.) |
| The cost of investing for this characteristic:<br><br>Very High: VH<br>High: H<br>Low: L<br>Very Low: VL | 1.                                                                                                        | 2.                                                                                                                                          | 3.                                                                                                                                 | 4.                                                                                                      | 5.                                                                     | 6.                                                                                                                                                        | 7.                                                                                                                         |

## APPENDIX 4. Türkçe Soru Formları

### (Anket – KFG – Maliyet Analizi)

#### LOJİSTİK MERKEZLERDE MÜŞTERİ BEKLENTİLERİ VE SATINALMA DAVRANIŞI SORU FORMU

##### PROFİL SORULARI:

- 1- Yaşınız : ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 ve üstü
- 2- Cinsiyetiniz : ☐ Kadın ☐ Erkek
- 3- Mesleğiniz / Ünvanınız :
- 4- Şimdiki işyerinizde çalışma süreniz : Yıl / Ay
- 5- Profesyonel çalışma süreniz : Yıl / Ay
- 6- İşletmenizde çalışan sayısı : ☐ 1-9 ☐ 10-49 ☐ 50-250 ☐ 250'den fazla
- 7- İşletmenizin kuruluş yılı / faaliyet merkezi : \_\_\_\_ / \_\_\_\_
- 8- İşletmeniz yabancı ortaklı mı? : ☐ Evet (Yabancı ortağa ait payın, toplam hisse içinde yüzdesi: % \_\_\_\_ ) ☐ Hayır
- 9- İşletmeniz ağırlıklı olarak lojistiğin hangi alanlarında faaliyet göstermektedir? (Birden fazla işaretleyebilirsiniz)
- ☐ Karayolu Taşımacılığı % ☐ Havayolu Taşımacılığı % ☐ Denizyolu Taşımacılığı % ☐ Demiryolu Taşımacılığı %
- ☐ Freight Forwarder % ☐ Intermodal Taşımacılık % ☐ Liman İşletmeciliği % ☐ Depoculuk %
- ☐ Diğer, Lütfen belirtiniz: %

#### I. Genel Sorular (Çalıştığınız işletme adına düşünerek yanıtlayınız)

|                                                                                                                                                | 1: Kesinlikle katılmıyorum | 5: Kesinlikle katılıyorum | 1                        | 2                        | 3                        | 4                        | 5                        |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Lojistik merkez/lojistik köy hakkında yeterli bilgim vardır.                                                                                | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Çalıştığım şirkete göre, bulunduğumuz bölgede bir lojistik merkez kurulması gerekmektedir.                                                  | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Çalıştığım şirkete göre, bölgemizde kurulacak böyle bir lojistik merkeze yeterli talep doğacaktır.                                          | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Çalıştığım şirket kurulacak olan lojistik merkezde yer alacaktır.                                                                           | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Çalıştığım şirket kurulacak olan lojistik merkezden hizmet alacaktır.                                                                       | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Çalıştığım şirket kurulacak olan lojistik merkezde rakipleriyle aynı yerde bulunmak istemez.                                                | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Çalıştığım şirket kurulacak olan lojistik merkeze yatırım yapacaktır.                                                                       | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Müşterilerim çalıştığım şirketin lojistik merkez üzerinden hizmet vermesini isteyecektir.                                                   | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Çalıştığım şirket lojistik merkeze yatırımlarını satın alma yoluyla yapacaktır.                                                             | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Çalıştığım şirket lojistik merkeze yatırımlarını uzun dönemli kiralama yoluyla yapacaktır.                                                 | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Çalıştığım şirket, lojistik merkezin kurulmasıyla tüm operasyonlarını ve tesislerini bu alana kaydıracaktır.                               | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Çalıştığım şirket, lojistik merkeze ilk yatırımını, operasyonlarının <b>bir kısmını</b> merkeze kaydırarak yapacaktır.                     | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Çalıştığım şirket, rakipleriyle ve diğer sektör firmalarıyla aynı yerde bulunmanın yaratacağı sinerji ve rekabet üstünlüğünün farkındadır. | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Çalıştığım şirkete göre, lojistik merkezin tek bir birim tarafından yönetilmesi gerekmektedir.                                             | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Çalıştığım şirkete göre, lojistik merkez devlet tarafından yönetilmelidir.                                                                 | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Çalıştığım şirkete göre, lojistik merkez yönetiminde yerel yönetimler de (belediyeler) yer almalıdır.                                      | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Çalıştığım şirkete göre, lojistik merkez özel sektör tarafından yönetilmelidir.                                                            | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Çalıştığım şirkete göre, lojistik merkez kamu-özel sektör ortaklığı tarafından yönetilmelidir.                                             | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**II. Şirketim için bulunduğumuz bölgede kurulacak bir lojistik merkezde aşağıdaki altyapı özelliklerinin bulunması önemlidir.**

| 1: Oldukça önemsiz<br>5: Oldukça önemli                                                | 1                        | 2                        | 3                        | 4                        | 5                        |                                                       | 1                                | 2                        | 3                        | 4                        | 5                        |
|----------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------------------------|----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| İntermodal terminal (karayolu-demiryolu aktarma terminali)                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Bankalar                                              | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Kapalı raflı depolar                                                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Restoranlar                                           | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Antrepolar                                                                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Oteller                                               | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| TIR Parkı                                                                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Üniversite araştırma birimleri                        | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Konteyner istif alanları                                                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Ticaret odaları, ihracatçı birlikleri gibi kuruluşlar | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tamir ve bakım alanları                                                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Gümrük ofisleri                                       | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Benzin istasyonları                                                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Liman ile entegrasyon                                 | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Çalışma ofisleri                                                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Karayolu ve demiryolu bağlantıları                    | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Postane                                                                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Bilgi ve iletişim teknolojileri altyapısı             | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Güvenlik binaları                                                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Enerji altyapısı                                      | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Kütüphane                                                                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Bakanlıklar, müdürlükler gibi devlet birimleri        | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Soğuk hava depoları                                                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Kütüphane                                             | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tank (sıvı ürün) depoları                                                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Afet merkezi                                          | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Dökme ürün depoları (örn. Silo)                                                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Tehlikeli madde deposu                                | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Açık depolama alanları                                                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Parsiyel yük terminalleri                             | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Diğer (Lütfen bulunması gerektiğini düşündüğünüz diğer altyapı özelliklerini yazınız.) |                          |                          |                          |                          |                          |                                                       | 1. _____<br>2. _____<br>3. _____ |                          |                          |                          |                          |

**III. Şirketime göre bir lojistik merkez yönetimi, yatırımcılarına aşağıdaki hizmetleri sağlamalıdır.**

| 1: Oldukça önemsiz 5: Oldukça önemli                           | 1                                | 2                        | 3                        | 4                        | 5                        |
|----------------------------------------------------------------|----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Tek noktadan hizmet alabilme                                   | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tamir bakım hizmetleri                                         | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Bilgi ve iletişim teknolojileri altyapı ve satış hizmetleri    | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez pazarlama hizmeti                              | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Danışmanlık ve çözüm geliştirme hizmeti                        | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Kalite ve performans yönetimi hizmetleri                       | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Anlaşmazlık çözümü hizmeti                                     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Gayrimenkul satış, kiralama ve geliştirme hizmeti              | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tedarik zinciri çözüm hizmetleri                               | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Paketleme, etiketleme vb katma değerli lojistik hizmetleri     | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emniyet hizmeti                                                | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Güvenlik hizmeti                                               | <input type="checkbox"/>         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Diğer (Lütfen eklemek istediğiniz hizmet kalemlerini yazınız.) | 1. _____<br>2. _____<br>3. _____ |                          |                          |                          |                          |

**III. Şirketimin bulunduğumuz bölgede kurulacak bir lojistik merkezden beklentileri aşağıdaki gibidir.**

| 1: Kesinlikle katılmıyorum                                                                                                                      | 5: Kesinlikle katılıyorum | 1                        | 2                        | 3                        | 4                        | 5                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Lojistik maliyetlerimizi düşürecek.                                                                                                             |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| İntermodal taşımacılığın gelişmesini sağlayacaktır.                                                                                             |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ölçek ekonomisinden faydalanmamızı sağlayacaktır.                                                                                               |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ortak pazarlama stratejileri aracılığıyla yeni müşteriler kazanmamızı sağlayacaktır.                                                            |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ortak işgücü havuzu yaratarak nitelikli çalışanlara daha kolay ulaşmamızı sağlayacaktır.                                                        |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Uzmanlaşmış tedarikçi/taahhüt kaynağı sağlayacaktır.                                                                                            |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ortak ulaştırma altyapısını kullanarak birim maliyetlerimizi düşürmemizi sağlayacaktır.                                                         |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ortak enerji altyapısını kullanarak birim maliyetlerimizi düşürmemizi sağlayacaktır.                                                            |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ortak bilgi iletişim teknolojisi altyapısını kullanarak birim maliyetlerimizi düşürmemizi sağlayacaktır.                                        |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Esnekliğimizi ve müşteri ihtiyaçlarına yanıt verebilme yeteneğimizi artıracaktır.                                                               |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ekonomik, politik, yasal, teknolojik, demografik veya kültürel çevrede meydana gelecek değişikliklere daha kolay adapte olmamızı sağlayacaktır. |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Limanlarla veya organize sanayi bölgeleri gibi üretim alanlarıyla daha sıkı işbirliği içinde olmamızı sağlayacaktır.                            |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez, içinde yer alan bize benzer diğer firmalarla daha sıkı işbirliği içinde olmamızı sağlayacaktır.                                |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez, içinde yer alan firmalar arasında bilgi paylaşımının artmasını sağlayacaktır.                                                  |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez, içinde yer alan firmalar arasında güvenin artmasını sağlayacaktır.                                                             |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hizmet üretimi için kullandığımız işgücü, enerji, bilgi, uzmanlık gibi girdilerin yakınımızda yer almasını sağlayacaktır.                       |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| İyi uygulamaların lojistik merkez içinde yer alan şirketler arasında yaygınlaşmasını sağlayacaktır.                                             |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez içinde yer alan rekabet sayesinde yenileşim (inovasyon) artacaktır.                                                             |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hizmet kalitemizin artmasını sağlayacaktır.                                                                                                     |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez içindeki sinerji arz ve talep pazarları üzerindeki etkimizi artıracaktır.                                                       |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez içindeki sinerji politik/yasal çevre üzerindeki etkimizi artıracaktır.                                                          |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez içindeki AR-GE kurumları ve üniversite birimleri lojistik çözümlerimizi geliştirecektir.                                        |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Müşterilerimize sunduğumuz lojistik çözümlerini geliştirmemizi sağlayacaktır.                                                                   |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez bölgemizin ekonomik olarak gelişmesini sağlayacaktır.                                                                           |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez bölgemizdeki sosyal yaşamının gelişmesini sağlayacaktır.                                                                        |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lojistik merkez çevre kirliliğinin azaltılmasına olumlu katkı sağlayacaktır..                                                                   |                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Diğer (Lütfen eğer eklemek istediğiniz farklı beklentileriniz var ise yazınız.)                                                                 |                           | 1. _____                 | 2. _____                 | 3. _____                 |                          |                          |

**V. Şirketimin bulunduğumuz bölgede kurulacak bir lojistik merkezden yer veya hizmet satın almasına etki edecek faktörler.**

1. Aşağıdaki makro çevre değişkenleri, şirketinizin bir lojistik merkezden yer (arazi/ bina/tesis vb.) almasını ne ölçüde etkiler? Lütfen yanlarındaki kutulara 1: Hiç etkilemez. 5: Çok etkiler olmak üzere 1'den 5'e kadar numaraları kullanarak işaretleyiniz.

|                                                        |   |                                                  |   |                                                                             |   |
|--------------------------------------------------------|---|--------------------------------------------------|---|-----------------------------------------------------------------------------|---|
| Doğal Çevre<br>(Hava kirliliği,<br>küresel ısınma vb.) | — | Yasal Çevre<br>(Kanunlar,<br>düzenlemeler vb.)   | — | Politik Çevre<br>(örn. Seçim, uluslar<br>arası ilişkiler)                   | — |
| Ekonomik Çevre<br>(Satınalma gücü,<br>enflasyon vb.)   | — | Teknolojik Çevre<br>(örn. RFID, GPS,<br>EDI vb.) | — | Sosyo-kültürel Çevre<br>(örn. İnançlar, tutumlar,<br>beğeniler, kültür vb.) | — |

2. Aşağıda şirketinizin görev çevresi ve dış çevresinde yer alan paydaşlar şirketinizin bir lojistik merkezden yer almasını ne ölçüde etkiler? Lütfen yanlarındaki kutulara 1: Hiç etkilemez. 5:Çok etkiler olmak üzere 1’den 5’e kadar numaraları kullanarak işaretleyiniz.

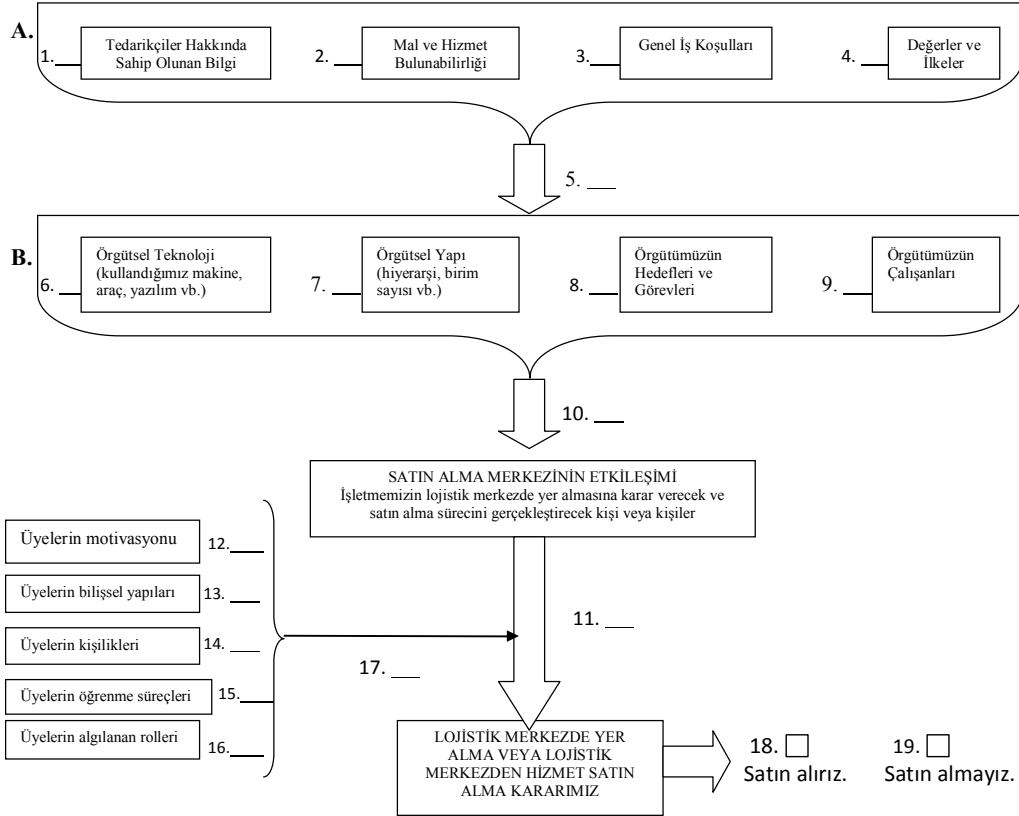
|                  |   |                             |   |                                          |   |
|------------------|---|-----------------------------|---|------------------------------------------|---|
| Müşteriler       | — | Profesyonel Meslek Grupları | — | Diğer Sosyal Kurumlar (Sivil Toplum vb.) | — |
| Tedarikçiler     | — |                             |   |                                          |   |
| Devlet           | — | Diğer İşletmeler - Rakipler | — | Ticari Dernek ve Odalar                  | — |
| İşçi Sendikaları | — |                             |   |                                          |   |

3. Aşağıda verilen örgütsel satın alma modeli üzerindeki değişkenler arasındaki okların yanlarına ok çıkan değişkenin, ok gelen değişkeni ne ölçüde etkilediğini, kendi kurumunuzun lojistik merkezden yer satın alma sürecini düşünerek 1: Hiç etkilemez. 5:Çok etkiler olmak üzere 1’den 5’e kadar numaraları kullanarak işaretleyiniz.

**A Grubu: Makro çevre ve görev çevresi değişkenlerinin etki araçları**

**B Grubu: Örgütsel satın alma kararını etkileyen örgütsel değişkenler**

**Lojistik merkezden yer veya hizmet satın alma kararımızı: 1: Hiç etkilemez. 5: Çok etkiler.**



**SORU FORMU İKİ AYRI SORUDAN OLUŞMAKTADIR.**

1. Aşağıdaki tabloda sol tarafa yatay olarak verilen satırlarda Türkiye’de kurulacak olan lojistik köylerle dair müşteri beklentileri yer almaktadır. Üst tarafta dikey olarak verilen sütunlarda ise bu lojistik köylerde yer alacak teknik özellikler bulunmaktadır. Lütfen müşteri beklentileri ile teknik özellikler arasında bulunduğunu düşündüğünüz ilişki düzeyini G: Güçlü; O: Orta ve Z: Zayıf kodlamasına göre G, O veya Z harfleri ile doldurunuz. Herhangi bir ilişki olmadığını düşünüyorsanız kutuyu boş bırakabilirsiniz. (Örnek uygulama: Rekabet avantajı beklentilerinizi en çok enerji altyapısı, liman bağlantısı, kara-demiryolu entegrasyonu gibi temel altyapı özelliklerinin karşılayacağını düşünüyorsanız 2 numaralı kutuya G yazabilirsiniz. Ancak işbirliği ve güven beklentiniz ile temel altyapı özellikleri arasında zayıf bir ilişki olduğunu düşünüyorsanız 16 numaralı kutuya Z yazabilirsiniz.)

|                                                     |                                                                                                                                                                                              | LOJİSTİK KÖYLERDE BULUNACAK TEKNİK ÖZELLİKLER                                                         |                                                                                                                                 |                                                                                                               |                                                                                                     |                                                                           |                                                                                                                                                |                                                                                                              |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
|                                                     |                                                                                                                                                                                              | Destek Kurumları (Çağrı Merkezi, oteller, restoranlar, kütüphane, üniversiteler, ticaret odaları vb.) | Temel Altyapı (Kara-demir entegrasyonu, liman-lojistik köy entegrasyonu, gümrük, enerji altyapısı, bilgi teknolojisi altyapısı) | Depo ve İntermodal (İntermodal terminal, standart depolar, antrepolar, açık saha depolar, konteyner sahaları) | İkincil Destekler (Benzin istasyonları, TIR Parkı, Çalışma ofisleri, Postaneler, Güvenlik ofisleri) | Özel Depolama (Soğuk hava depoları, tanklar, silolar, dökme yük depoları) | Katma Değerli Hizmetler (Pazarlama hizmetleri, danışma ve sorun çözümü hizmetleri, paketleme, etiketleme vb tek noktadan alışveriş hizmetleri) | Standart Hizmetler (Tamir ve bakım hizmetleri, güvenlik ve emniyet hizmetleri, bilgi teknolojisi hizmetleri) |
| <b>MÜŞTERİLERİN LOJİSTİK KÖYLERDEN BEKLENTİLERİ</b> | Rekabet Avantajı (çevreyi etkileme gücü, çevreye uyum kapasitesi, işgücü, enerji gibi kaynaklara yakınlık, uzman tedarikçiye yakınlık, sinerji, iç rekabet sayesinde yenilikçiliğin artması) | 1.                                                                                                    | 2.                                                                                                                              | 3.                                                                                                            | 4.                                                                                                  | 5.                                                                        | 6.                                                                                                                                             | 7.                                                                                                           |
|                                                     | Verimlilik ve Yanıt Verebilirlik (hizmetlerin geliştirilmesi, intermodal taşımacılığın geliştirilmesi, lojistik maliyetlerin düşmesi)                                                        | 8.                                                                                                    | 9.                                                                                                                              | 10.                                                                                                           | 11.                                                                                                 | 12.                                                                       | 13.                                                                                                                                            | 14.                                                                                                          |
|                                                     | İşbirliği ve Güven (içerideki firmalar arasında bilgi paylaşımının, işbirliğinin ve güvenin artması)                                                                                         | 15.                                                                                                   | 16.                                                                                                                             | 17.                                                                                                           | 18.                                                                                                 | 19.                                                                       | 20.                                                                                                                                            | 21.                                                                                                          |
|                                                     | Sürdürülebilirlik (lojistik faaliyetlerin ekonomik olarak sürdürülebilir olması, topluma fayda sağlaması ve fiziksel çevreye olan olumsuz etkileri düşürmesi)                                | 22.                                                                                                   | 23.                                                                                                                             | 24.                                                                                                           | 25.                                                                                                 | 26.                                                                       | 27.                                                                                                                                            | 28.                                                                                                          |

2. Lütfen aşağıdaki tabloda yer alan müşteri beklentilerine ilişkin yan sütunlarda verilen 3 soruyu ölçekler bağlamında cevaplayınız.

- İlk soruda beklenti maddelerinin işletmeniz için önem derecesi,

- İkinci soruda, kurulacak bir lojistik merkezin bu beklentileri karşılama olasılığı,

- Üçüncü soruda ise lojistik merkez haricinde yer alan ve hali hazırda kullanmakta olduğunuz kendi özel tesislerinizin veya kiraladığınız tesislerin bu beklentileri karşılama olasılığı sorulmaktadır.

|                                                                                                                                                                                              | 1. ÖNEM DERECEŚİ NEDİR?                                  | 2. LOJİSTİK MERKEZİN BU BEKLENTİLERİ KARŞILAMA OLASILIĞI | 3. KENDİMİZE AIT ÖZEL TESİSLERİMİZİN YA DA KİRALANAN TESİSLERİN (LOJİSTİK KÖY DİŐİNDA) BU BEKLENTİLERİ KARŞILAMA OLASILIĞI |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>MÜŞTERİLERİN LOJİSTİK KÖYLERDEN BEKLENTİLERİNİN</b>                                                                                                                                       | ÇY: Çok Yüksek<br>Y: Yüksek<br>D: Düşük<br>ÇD: Çok Düşük | ÇY: Çok Yüksek<br>Y: Yüksek<br>D: Düşük<br>ÇD: Çok Düşük | ÇY: Çok Yüksek<br>Y: Yüksek<br>D: Düşük<br>ÇD: Çok Düşük                                                                   |
| Rekabet Avantajı (çevreyi etkileme gücü, çevreye uyum kapasitesi, işgücü, enerji gibi kaynaklara yakınlık, uzman tedarikçiye yakınlık, sinerji, iç rekabet sayesinde yenilikçiliğın artması) |                                                          |                                                          |                                                                                                                            |
| Verimlilik ve Yanıt Verebilirlik (hizmetlerin geliştirilmesi, intermodal taşımacılığın geliştirilmesi, lojistik maliyetlerin düşmesi)                                                        |                                                          |                                                          |                                                                                                                            |
| İşbirliği ve Güven (içerideki firmalar arasında bilgi paylaşımının, işbirliğinin ve güvenin artması)                                                                                         |                                                          |                                                          |                                                                                                                            |
| Sürdürülebilirlik (lojistik faaliyetlerin ekonomik olarak sürdürülebilir olması, topluma fayda sağlaması ve fiziksel çevreye olan olumsuz etkileri düşürmesi)                                |                                                          |                                                          |                                                                                                                            |

**SORU FORMU**

1. Aşağıdaki tabloda Türkiye’de kurulacak olan lojistik köylerde yer alacak teknik özellikler bulunmaktadır. Bu teknik özellikler daha önce Türkiye’de faaliyet gösteren lojistik hizmet sağlayıcılara uygulanan anket sorularına verilen yanıtlar ışığında gruplandırılmıştır. Lütfen aşağıdaki teknik özellik gruplarını, bir lojistik merkez içinde oluşturmak için gereken yatırım maliyetini ÇY, Y, D ve ÇD ölçeğini kullanarak değerlendiriniz. (Örnek uygulama: Depo ve intermodal altyapılarının kurulum maliyetinin çok yüksek olduğunu düşünüyorsanız altındaki kutuya ÇY yazabilirsiniz.)

|                                                                                                        | LOJİSTİK KÖYLERDE BULUNACAK TEKNİK ÖZELLİKLER                                                            |                                                                                                                                    |                                                                                                                  |                                                                                                        |                                                                              |                                                                                                                                                   |                                                                                                                 |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                                                                                                        | Destek Kurumları<br>(Çağrı Merkezi, oteller, restoranlar, kütüphane, üniversiteler, ticaret odaları vb.) | Temel Altyapı<br>(Kara-demir entegrasyonu, liman-lojistik köy entegrasyonu, gümrük, enerji altyapısı, bilgi teknolojisi altyapısı) | Depo ve Intermodal<br>(Intermodal terminal, standart depolar, antrepolar, açık saha depolar, konteyner sahaları) | İkincil Destekler<br>(Benzin istasyonları, TIR Parkı, Çalışma ofisleri, Postaneler, Güvenlik ofisleri) | Özel Depolama<br>(Soğuk hava depoları, tanklar, silolar, dökme yük depoları) | Katma Değerli Hizmetler<br>(Pazarlama hizmetleri, danışma ve sorun çözümü hizmetleri, paketleme, etiketleme vb tek noktadan alışveriş hizmetleri) | Standart Hizmetler<br>(Tamir ve bakım hizmetleri, güvenlik ve emniyet hizmetleri, bilgi teknolojisi hizmetleri) |
| Bu teknik özelliği kurmanın maliyeti:<br><br>Çok Yüksek : ÇY<br>Yüksek: Y<br>Düşük: D<br>Çok Düşük: ÇD | 1.                                                                                                       | 2.                                                                                                                                 | 3.                                                                                                               | 4.                                                                                                     | 5.                                                                           | 6.                                                                                                                                                | 7.                                                                                                              |

APPENDIX 5.The Research Map

Figure A3. Research Map

