(Araştırma)

VALUE-ADDED SERVICES FROM A PORT CENTRIC LOGISTICS PERSPECTIVE: A LITERATURE REVIEW [1]

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ABSTRACT

The traditional roles of a port such as cargo (un)loading, and storage, are not sufficient in the severe competitive environment anymore. As customer requirements are constantly changing, the raison d'être of a port needs to be re-evaluated and a port should be re-positioned as a value-added logistics services hub. For instance, ports, service-providing actors in the supply chain, can expand the cargo types served through value-added logistics services offered in the port area or within its close vicinity.and increase their revenues. Port customers, particularly shippers, can benefit from obtaining additional value-added logistics services and achieving cost advantage by eliminating certain supply chain activities. Such positive contributions are key to achieving a competitive advantage for both customers and ports. Although there are a considerable number of research that concentrate on improving port competitiveness, few numbers of research address the value-added services provided by ports for increasing their competitiveness or harmonization to a port-centric logistics viewpoint. For this reason, this research concentrates on establishing a value-added logistics services bundle that disclose whether a port embraces an approach for port-centric logistics. In order to reach that aim, we conduct a systematic literature review, which initially provides some statistics about the journals in which the accessed articles are published, the nations of the first authors' institutions, and the findings of the books, discussion papers, and reports reached. Additionally, the results of the research show that light manufacturing and assembly, packing and information and communication technologies are the most common value-added logistics services. Although these services are the sources of competitive advantage for a port, these services need to be continuously developed in order to provide long-term sustainable competitive advantage in the port industry, which is a dynamic market.

Keywords: port-centric logistics, port logistics services, competitive advantage, value-added logistics services, Resource-Based View

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LİMAN MERKEZLİ LOJİSTİK PERSPEKTİFİNDEN KATMA DEĞERLİ LOJİSTİK HİZMETLERİNE İLİŞKİN BİR LİTERATÜR İNCELEMESİ

ÖZET

Yükleme/boşaltma ve depolama gibi bir limanın geleneksel rolleri, şiddetli rekabet ortamında artık yeterli olmamaktadır. Müşteri gereksinimleri sürekli değişirken, bir limanın varlık sebebinin yeniden değerlendirmesi ve katma değerli lojistik hizmetler merkezi olarak yeniden konumlandırılması gerekmektedir. Örneğin, tedarik zincirinde hizmet sağlayan aktörler olan limanlar, liman sahası veya yakın çevresinde sağlanan katma değerli lojistik hizmetler ile hizmet verilen kargo türlerini genişletebilir ve gelirlerini artırabilir. Liman müşterileri, özellikle de yük sahipleri, bir limandan ek katma değerli lojistik hizmetler almaktan ve belirli tedarik zinciri faaliyetlerini ortadan kaldırarak maliyet avantajı elde etmekten yararlanabilirler. Bu tür olumlu katkılar, hem müşteriler hem de limanlar için rekabet avantajı elde etmenin anahtarıdır. Limanın rekabetçiliğini artırmaya odaklanan önemli sayıda araştırma olmasına karşın, liman merkezli bir lojistik bakış açısına uyum sağlamak için sağladığı katma değerli hizmetleri ele alan az sayıda araştırma bulumaktadır. Bu nedenle, bu araştırma, bir limanın liman merkezli lojistik yaklaşımını benimseyip benimsemediğini ortaya çıkaran katma değerli lojistik hizmetleri oluşturmaya odaklanmaktadır. Bu amaca ulaşmak için sistematik bir literatür taraması yapılmış ve literatür taramasının ilk bulguları, ulaşılan makalelerin yayınlandığı dergiler, ilk yazarların kurumlarının ülkeleri ve yazarların bulguları hakkında bazı istatistikler sunmaktadır. Ayrıca araştırma sonuçları, katma değerli lojistik hizmetler içerisinde en yaygın olarak hafif imalat ve montaj, paketleme ile bilgi ve iletişim teknolojilerinin yer aldığını göstermektedir. Bu hizmetler, bir liman için rekabetçi avantaj sağlayan kaynaklar olmalarına rağmen, dinamik bir pazar olan liman endüstrisinde uzun dönemli sürdürülebilir rekabetçi avantaj sağlamak için bu hizmetlerin sürekli olarak iyileştirilmesi ve geliştirilmesi gerekmektedir.

Anahtar Kelimeler: liman merkezli lojistik, liman lojistik hizmetleri, rekabet avantajı, katma değerli lojistik hizmetler, kaynak temelli yaklaşım

1.Introduction

In the age of globalization expanding the scope of trade and supply chains, the transportation sector is as vital as the production phase in developing different strategies for the differentiated and complex supply chain (Lagoudis et al., 2017). Ports, which are nodal points in the transportation sector with their leading positions for complex logistics networks (Mondragon et al., 2012), directly affect the relations of the parties they serve with their customers and suppliers, and due to this, port authorities and managers adopt new strategies to adapt to dynamic market conditions. (Pettit and Beresford, 2009; Lagoudis et al., 2017; Han, 2018).

A firm's strategic choices and competitive advantage are influenced by ''value'' (De Martino et al., 2015). Accordingly, Supply Chain Management (SCM) literature points out that having an integrated approach to managing activities and processes throughout the entire supply chain is critical in increasing the value offered to customers and providing a competitive advantage (De Martino et al., 2015).

In parallel to this, ports withdraw from being centers that only provide basic services for ships and cargo and are positioned not only as a part of the transportation system but also as a major sub-system of production and logistics systems with a broader perspective, focusing on value-added logistics (Bichou and Gray, 2004). In other words, ports becoming a value-oriented nodal point (Loh and Thai, 2014), create a networking site that carries out their transactions and processes and brings together many different actors of the supply chain (De Martino et al., 2015). As a reflection of this, the fact that ports offer additional logistics facilities is regarded as a necessary activity in many ports (Pettit and Beresford, 2009).

Ports determine the port areas that require expansion and the functions that can be attached to them through the port planning approach, which is one of the key strategic tools for a port to expand its market share compared to its rivals (Ghasemi et al., 2020). In addition, Notteboom and Haralambides (2020) emphasized the necessity of taking action on the port's adaptive capacity and adaptive port planning, considering the port competition between regions, internalization of port authorities, and sustainability issues (Ghasemi et al., 2020). Going beyond these, in today's conditions, ports have to be competitive in their operations that include the hinterland area, not limited to their area (Mason et al., 2015). In other words, port authorities can embrace entrepreneurship by making direct investments in its hinterland or have a facilitating role by making strategic partnerships with other neighbouring ports or similar facilities such as dry ports and inland ports (Verhoeven, 2010; De Martino et al., 2015).

The value-creation approach of port authorities aims to attract private investment, promote the public interest, and reduce the negative externalities created by all supply chains passing through the port with a collaborative perspective (De Martino et al., 2015). Within these chains, ports make technology investments,

resource exchange, and information sharing in order to increase productivity, efficiency, and customer satisfaction (De Martino et al., 2015).

Therefore, today a port is defined as a location with infrastructure and superstructures capable of serving ships and other modes of transportation, moving commodities between ship and shore, and providing value-adding logistics services (Paixao and Marlow, 2003). Similarly, Panayides and Song (2008:562) view ports as a part of a network including multiple logistics and transportation actors with the aim of adding value to the ultimate customers. Since supply chain strategies add new roles to ports as logistics centres, transfer centres, or distribution centres, it can be asserted that the role of a port has evolved from acting as a simple transhipment centre to a logistics nodal point (Güneş and Esmer, 2016). This implies that a port has grown into a contemporary international logistics centre that offers integrated logistical services (Yang et al., 2013). Due to the strong rivalry in the port logistics industry, value-added services have therefore become crucial functions of a port.

In the literature, Port-Centric Logistics (PCL) perspective is mostly addressed from the point of view of revenue creation from physical flow which covers the facilities dedicated to cargo-specific services by paying no attention to information flow. However, a port is at the heart of two kinds of flows: Physical flow and Information flow. The former is concerned with cargo movement/handling by means of a port, whereas the latter incorporates operation-related information for cargo, ship, and other modes of transportation (Paixao and Marlow, 2003: 359). The more a port is capable of performing all of these activities together, the more it is regarded as a functional solution partner (Paixao and Marlow, 2003). In addition, some studies such as Chen and Notteboom (2012) and De Martino et al. (2015) emphasize the need of properly updating and compiling the value-added logistics services (VALS) offered by a port from the viewpoint of PCL.

Due to the discussion above, the study employs Resource-Based View (RBV) and Dynamic Capabilities View (DCV) as foundational bases. RBV sees a firm as a bundle of resources having specific characteristics, which in turn, create competitive advantage (Barney, 1991), whereas DCV infers that firms have different capabilities, and these capabilities explain long-term performance differentials among firms (Teece et al., 1997). While RBV is criticised about being static, DCV aims to respond to the changes experienced in the environment through integration, adaptation, and reconfiguration of both external and internal resources (Teece and Pisano, 1994). We believe that VALS offered within the port area and its proximity could be seen as resources and capabilities, which will enhance competitive position of ports. Therefore, creating a list of VALS from a PCL perspective, which is the main aim of the study, would contribute to the literature.

For this purpose, the study is organized in the following manner. The next part will offer theoretical background on port-centric logistics approach, followed by the study's methodology. The study's findings will then be presented, followed by the discussion and conclusion part.

2. Conceptual Framework

PCL is described as "*the provision of distribution facilities and value-adding operations in the port region*" (Mangan et al., 2008). This approach emphasizes the integration of freight corridors, inland terminals, and freight transportation networks as crucial components of PCL (Jeevan et al., 2018). For example, the quality of hinterland connectivity and land availability are the primary drivers of the approach's applicability (Monios and Wilmsmeir, 2012: 217). PCL may therefore be proposed as a beneficial tool to make a port an active element in the supply network (Mangan et al., 2008).

A port shows a tendency to offer alternative services because profit earned through traditional activities is minimal. (Mangan et al., 2008). Despite additional costs incurred by VALS supplied, the advantages to be achieved via PCL push a port business and a shipper to embrace this approach (Bouchery et al., 2020). Previous research (e.g., Chen and Notteboom, 2012; De Martino et al., 2015) regarding the VALS offered by a port from PCL perspective indicates that there is a need of these services to be updated. Thus, this study aims to present a VALS bundle that disclose whether a port is following the PCL approach, and accordingly assisting a port in increasing its market competitiveness.

From a theoretical standpoint, identifying VALS assists sector experts in gaining a competitive advantage as these services aid a port in differentiating its services depending on a Resource-Based View (RBV). RBV has become one of the most cited theories in especially management studies due to its simplicity, and having an appealing, easily grasped, and taught core message. (Kraaijenbrink et al., 2010). One of the pioneers of the theory is Barney (1991) and the scholar identifies firms, as a collection of productive resources and capabilities that provide a diverse variety of services, resulting in a competitive advantage. This means the theory classifies internal resources of the firm to reach sustained competitive advantage (Kraaijenbrink et al., 2010). These resources could include tangible and intangible inputs and/or assets like skills, processes, routines, brand names, skilled personnel, machinery, trade contracts, information, and knowledge. (Barney et al., 2001; Wernerfelt, 1984).

The idea is further supported by several scholars (e.g. Peteraf, 1993; Raddats and Easingwood, 2010; Cousins et al., 2008). For instance, Raddats and Easingwood (2008) and Halawi et al., (2005) confirm that as each company possesses unique resources, this may lead to long-term and/or sustainable competitive advantage. According to the theory, superior performance and thus competitive advantage can be gained if a firm economically produces its products and/or services, and/or satisfy customers' needs better than its competitors (Barney, 1991; Peteraf, 1993).

Cousins et al., (2008, p.34) also claims that some specific circumstances aid the development of long-term superior value. According to the theory, these

circumstances are called as VRIN characteristics: Valuable, rare, inimitable, and non-substitutable (Barney, 1991). This can be interpreted as obtaining a competitive advantage; a firm's bundle of resources and capabilities should be valuable through improving firm's efficiency, effectiveness (Barney, 2001), and customer satisfaction (Bogner and Thomas, 1994), and the valuable characteristic of resources are context dependent (Barney, 2001). Moreover, the theory assumes that the resource's future value is distributed asymmetrically, thus if the managers estimate the resource's future value, the company can gain competitive advantage over competitors (Kraaijenbrink et al., 2010). The resources should also be rare, and they cannot be obtained by other firms (Cousins et al., 2008, p.34). Furthermore, the product and/or a service offered should not be similar to others in the market, which emphasizes that it should be difficult to imitate by competitors (Dyer and Singh, 1998). The scholars (e.g. Dierickx and Cool, 1989) provide some situations in which resources may become inimitable. Barney (1991) states that having unique historical conditions, social complexity and/or causal ambiguity may lead to inimitability. For example, being at the right place at the right time (i.e. unique historical conditions) while developing or improving capabilities would lead to some advantages which may not be present in other time (Cousins et al., 2008, p.36). Similarly, social complex resources like culture or reputation require inputs which are exclusive to a company because they may be produced through organizational skills and corporate learning (Peteraf, 1993). For example, the superior financial performance of firms such as IBM or Proctor and Gamble is found to be related with their organizational culture including managerial values, and beliefs that are specific to those companies (Barney, 1986). Causal ambiguity means other companies cannot understand the link between the resources and the output/product/service, which makes it hard for them to imitate the product (Barney, 1991). From another perspective, if the resources are imitable, they are also substitutable, and they may become obsolete with time (Dierickx and Cool, 1989). However, a competitor should not have the same performance by simply replacing resources with alternatives (Madhani, 2010), otherwise competitive advantage cannot be reached.

Despite being popular, RBV has also been criticized extensively. For instance, the theory is criticised through eight categories, including "(a) the RBV has no managerial implications, (b) the RBV implies infinite regress, (c) the RBV's applicability is too limited, (d) SCA (sustained competitive advantage) is not achievable, (e) the RBV is not a theory of the firm, (f) VRIN/O (organization) is neither necessary nor sufficient for SCA, (g) the value of a resource is too indeterminate to provide a useful theory, and (h) the definition of resource is unworkable" (Kraaijenbrink et al. ,2010, p. 351). In another study, El Shafeey and Troot (2014) identify thirteen criticisms, including, investigating the dilemmas of VRIN characteristics, the static approach of the theory, the absence of a chain of causality, and excluding the synergetic effect of a bundle of resources, and being unimplementable in practice. Similarly, Cousins et al. (2008) question the stability assumption of RBV and asks what happens if the

market has fluctuations in terms of demand. A good discussion regarding the static view of RBV is presented by Sanchez (2008, p.49-50):

"RBV ... an essentially static view of the nature of competition and how firms generate rents... the competitive environments of firms may differ fundamentally and may span a spectrum from stable (seen largely as a special case) to highly dynamic (regarded as an increasingly common if not dominant context). Following directly from this assumption that there are fundamental differences in competitive contexts is the presumption that different kinds of competitive contexts will require different kinds of resources, capabilities, management processes, and strategic logics for a firm to succeed in creating value through competitive interactions."

As the statement above emphasizes, RBV may overlook the dynamic environment in which an organization operates, and thus it may be insufficient to explain the ways organizations could renew their resource base for maintaining their competitiveness (Teece, 2020). Accordingly, these criticisms produce another school of thought in this stream of research which is called as dynamic-capability view (DCV, Teece et al., 1997). DCV acknowledges that markets are dynamic, and thus firms have different capabilities to acquire and deploy resources (Wang and Kim, 2017), and these differences are the reasons of long-term performance variances (Teece et al., 1997). Capabilities, in that sense, are seen as a dynamic subset of resources and aim to improve other resources' productivity (Makadok, 1999), and finally help firms develop new strategies to adapt changing market conditions through combination and transformation of resources in innovative and diverse ways (Teece et al., 1997; Wang and Kim, 2017). Through integration, adaptation, and reconfiguration of both external and internal resources, DCV aims to respond to the changes experienced in the environment (Teece and Pisano, 1994), sense and shape opportunities and threats, and enables organizations to be agile, flexible, and resilient (Lessard et al., 1994). Thus, DCV refers to "the capacity of an organization to purposefully create, extend, or modify its resource base" (Helfat et al., 2007, p.1), which emphasizes that resources are creating a competitive advantage by bundling with capabilities, and this bundle continually adapts, integrates, and/or reconfigures into other resources and capabilities (Armstrong and Shimizu, 2007; Teece et al., 1997). When these resources and capabilities turned into products and/or services, they create customer value and competitive advantage, and this demonstrates that DCV complements the premise of RBV (Wang and Ahmed, 2007).

As ports operate in a complex and volatile environment with diverse resources, they need to acknowledge the resources and capabilities which could be in the form of value-added services, and through enhancing, modifying, or reconfiguring these services, superior value and competitive advantage could be achieved. By offering a list of value-added services, a port can easily see the ones already provided and make additions or reconfigure some of them to serve their customers in a better way and maintain a competitive position in the market.

3. Methodology

To identify VALS offered within the port area and its close vicinity, a systematic literature review is carried out. For systematic literature review, Web of Science is selected as a database since it allows access to prominent academic journals whose research areas are port competition and supply chain management. The research is carried out by seeking the articles incorporating the keywords such as *port centric logistics, port-based logistics,* and *port centric logistics zone* (See Table 1 for keyword list). These keywords are searched in both title and topic section. As a result, 143 academic articles published between 1999-2021 are reached. 105 of them are excluded as some parts of them are related to medical sciences and some are focusing on another aspects of port studies such as port dues, port congestion and route optimization. As a result, 38 academic articles are found relevant and added to the final reading list (See Table 1).

Table 1. Keyword List

Keywords	Section	Web of Science	
		Number of Articles	Relevant Number of Articles
Port Centric Logistics	Title	5	5
Port – Centric Logistics	Title	5 (repeated five) 0	4 (repeated four) 0
Port Based Logistics	Title	35	14
Port – Based Logistics	Title	3 (repeated three) 0	2 (repeated two) 0
Port Centered Logistics	Title	5	5
Port – Centric Logistics Zone	Topic	1	1
Port Centric Logistics Zone	Topic	1 (repeated one) 0	1 (repeated one) 0
Port Centric Maritime Cluster	Topic	1	0
Port – Centered Logistics	Topic	1	0
Port – Located Logistics	Topic	11	3
Port Located Logistics	Topic	95(repeated eleven)84	13(repeated three)10
Total		143	38

Although 38 academic articles are added to the reading list, in order not to miss any valuable data, the reference lists of the articles are checked as well. By doing so, additional sources such as reports (i.e., United Nations, 2002; World Bank, 2007), two books (i.e. Mattfeld, 2006; Geerlings et al., 2018;), a discussion paper (i.e. Acciaro and McKinnon, 2013), and additional 14 academic articles (e.g. Chen and Notteboom, 2012; Dias et al., 2010; Heitz et al., 2020; Jeevan et al., 2019) are collected. Thus, the ultimate list consists of 57 data sources in total.

Additionally, a face-to-face exploratory survey is used in the study to acquire the views of five experts with the aim of further categorization of VALS. Moreover, purposive sampling is used, and five experts are specified since they work in different branches of logistics and maritime industry (university, association, or corporate companies) (See Table 2).

Table 2. Expert List

Expert	Assignments
Expert 1	Member in Maritime Education Programs Evaluation and Accreditation Association (DEDEK)
Expert 2	Co-Head of Logistics Management Department
Expert 3	Lecturer (PhD) in Department of Maritime Business Administration
Expert 4	Dean of Maritime Faculty
Expert 5	Chief Officer in a Ship-owning Company

The experts are provided with the list of 46 VALS and asked to group them according to the ports' general services categorization of World Bank (2007) which includes value-added logistics (general logistics services and logistics chain integration services), and value-added facilities. By considering World Bank classification, 46 VALS are asked to be evaluated by the experts in terms of compliance to PCL approach, generalizability, availability, and applicability in Turkish ports.

4.Findings and Discussion

The first bundle of the findings reveals the descriptive statistics such as the distribution of articles on a yearly basis, and statistics on the affiliations of the authors. The second part of the findings list the VALS for PCL.

4.1. Descriptive Statistics

The year-based distribution of subject-related sources is presented as a bar graph in Figure 1. It is seen that most of the studies dealing with the PCL concept are published between the years 2016-2020. Most of the studies are published in 2018, 2019, and 2020 respectively. According to the year-based distribution analysis of the sources, it is found that the oldest sources available on the subject are mostly reports and books. To be more specific, the oldest one is a report published by the United Nations in 2002. This shows that the research on PCL is in its infancy, thus further research on this field is surely needed.

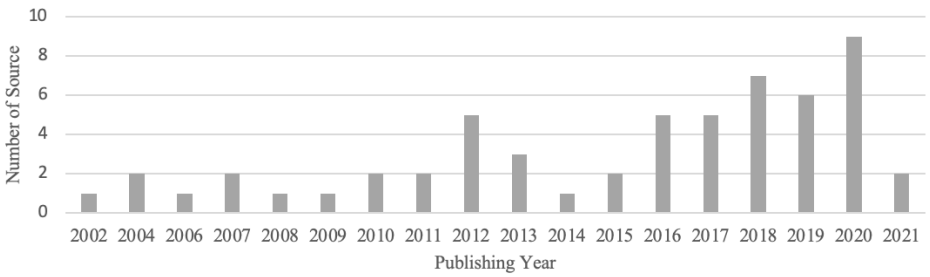

Figure 1. Source Distribution by Publishing Years

The analysis regarding the first authors' affiliated institutions includes 57 data sources that consist of 52 articles, 2 books, 2 reports, and 1 discussion paper. The first authors of the publications are mostly affiliated with institutions in China, followed by in United Kingdom and Italy, respectively (See Table 3).

Table 3. Affiliated Institutions of First Authors [5]

Countries	Number of Authors	%
China	15	27.2
United Kingdom	6	10.9
Italy	5	9.0
France	3	5.4
Germany	3	5.4
Portugal	3	5.4
Taiwan	3	5.4
Belgium	2	3.6
Turkey	2	3.6
Spain	2	3.6
The Netherlands	2	3.6
South Korea	1	1.8
Czecia	1	1.8
Greece	1	1.8
India	1	1.8
Malaysia	1	1.8
Norway	1	1.8
Poland	1	1.8
Sweden	1	1.8
United States of America	1	1.8
Total	55	99.3

The affiliation distribution shows that PCL is mostly and understandably studied in countries with major maritime trade. However, it should be noted that service demands may come from a landlocked country. Therefore, taking a dyadic view would shed further light on PCL research. A dyadic perspective may not even be adequate since there are multiple partners in the chain who contact and have operations with/through ports. Thus, future studies may focus on the channel partners' perceptions, relationships, and the challenges of processes with multiple partners, which may require the collaboration of researchers from several countries.

5 The reports prepared by the United Nations and the World Bank are excluded from the assessment as these reports are prepared institutionally. Thus, the analysis covers 55 data sources.

The Journal of Coastal Research and *Journal of Transport Geography* are the ones that mostly published regarding PCL concept (See Table 4). As expected, the PCL approach is found to be addressed by maritime discipline mostly, and most of the journals are indexed in Science Citation Index Expanded (SCIE). However, PCL cannot be restricted to maritime discipline merely. As ports are operating in a complex network, the research on ports could be multi-disciplinary which would produce further research areas. For instance, as ports are a part of several supply chains, logistics and supply chain fields could benefit from the studies in PCL. However, there are only a few studies in journals such as The International Journal of Logistics Management, Supply Chain Management An International Journal, Transportation Research Part A, and Part D. Journals on sustainability (e.g. Environment Development and Sustainability, Journal of Cleaner Production, Sustainability Journal) may be another focus for future studies, as ports could be a centre for economic and environmental pillars of sustainability. Ports can also be studied from a managerial perspective, indicating, for example, the relationships between the employers and employees, or the relationships between ports and chain partners such as liners, forwarders, customs, and governments, which may also affect the social pillar of sustainability. Finally, PCL could be investigated from a marketing perspective, as well. Ports are basically providing services for multiple customers which makes customer satisfaction harder as these diverse partners may have different goals and risk preferences. This also makes customer relationship management more complex, difficult, and important. Furthermore, ports are also centres of services. However, although the complex and dynamic service operations run in ports may be another focus for research, there are no papers published in services marketing journals for now.

Table 4. Journal List

Journals	Frequency	%	Index
Journal of Coastal Research	9	17.3	Science Citation Index Expanded (SCIE)
Journal of Transport Geography	6	11.5	Social Sciences Citation Index (SSCI)
Maritime Policy and Management	6	11.5	Social Sciences Citation Index (SSCI)
Maritime Economics & Logistics	3	5.7	Social Sciences Citation Index (SSCI)

Similar to the most preferred journal list for the publication, these journals are indexed in the science citation index which is not a surprise since it is observed that the quantitative research method is the common method for these articles. For instance, Weia and Dong, (2019) addressed *optimization problem* of inland import and export freight transport by using diverse scenarios utilizing a bi-objective mixed integer programming model. Similarly, Zhou (2020) examined

the *correlation* between Nanjing Port's[6] port and container handling capacities and its gross production, total imports and exports, total profit of large-scale industrial enterprises, gross industrial output value, fixed asset investment, gross output value of the construction industry, and total retail sales of consumer goods. In another study, Cao (2019) puts forward a *game model* to assess a port logistics park developed based on a public-private partnership and asserted that each party needs to be repositioned considering local forces. Tailoring themselves according to changes occurring in time and setting investment strategies in compliance with its own development plan and operation style is also a must. In order to assess service quality of international logistics centers of Taiwan ports, Liang et al., (2002) exploited the *fuzzy quality function deployment approach*, and the attributes of the service quality is listed as follows: (1) provision of door-to-door delivery for international customers, (2) transport cost, (3) logistics center operation efficiency, (4) accident handling (5) port operation efficiency.

Table 5. Research Type Distribution[7]

Research Type	Number	%
Quantitative	24	42.1
Qualitative	18	31.5
Mixed	15	26.3
Total	57	99.9

Although the majority of the articles are quantitative, there are also considerable number of articles that used qualitative and mixed research methods (See Table 5). In terms of research methods, as PCL is related with a specific area, most of the article researches are systematized by a case study consisting of a quantitative and a qualitative analysis (See Table 6). The case study is followed by a quantitative analysis such as optimization and multi criteria decision making models. Optimization models (e.g. bicriteria optimization model and interport model) are mostly employed for port-hinterland container logistics systems' economic analysis and strategic planning (Iannone, 2012), development strategy planning of coastal port logistics (Zhao, 2020), container depots (Palacio et al., 2016), location selection problem for dry port (Wang et al., 2018), and measuring advantages and disadvantages of intermodal solutions (Iannone and Thore 2010). On the other hand, multi-criteria decision-making model covers Analytical Hierarchy Process (AHP), Analytical Network Process (ANP) and Decision-Making Trial and Evaluation Laboratory (DEMATEL), for making a port central point in regional trade (Kim et al., 2020), and for exploring the barriers to port-centric supply chain integration from the viewpoint of emerging economy and multi stakeholder perspective (Venkatesh et al., 2020) (See Table 7), which will be detailed while discussing research method distribution (See Table 7). Qualitative

6 the largest inland port in China.

7 Research type analysis covers all of data sources found as a result of the research.

analysis includes case study, viewpoint, content analysis and literature review, and it is used to shed light on different aspects of PCL. For instance, Mangan et al., (2008) suggested that from supply chain management perspective, ports could play different roles that cannot be limited to their traditional roles, whereas Shi et al., (2011) assessed RFID application in terms of operational activities in port-based container logistics, and concluded that the container transportation industry is in the beginning phase of adapting RFID application into operational processes. In another study, Rodrigue (2017) underlined the necessity of port and logistics development projects for Panama, which is a leading intermediary position in the global liner transport network, to maintain its advantageous position. Notteboom (2016), similarly, investigated the applicability of adaptive capacity-building methods for container ports on rivers to maintain their competitive positions in the port systems. Furthermore, the author highlighted the subjects such as the broader public policy and power and politics which should be brought to the table while addressing the future of such ports.

Table 6. Research Method Distribution[8]

Research Method	Number	%
Case Study	23	37.0
Optimization	11	17.7
Multi Criteria Decision Making Model	8	12.9
AHP	5	8.06
DEMATEL	2	3.22
ANP	1	1.61
Factor Analysis	3	4.83
Fuzzy Logic	3	4.83
Regression Analysis	3	4.83
Viewpoint	3	4.83
Action Research	1	1.61
Content Analysis	1	1.61
Critical Review	1	1.61
Descriptive Analysis	1	1.61
Descriptive Statistics	1	1.61
Genetic Algorithm	1	1.61
Gray Correlation Analysis	1	1.61
Literature Review	1	1.61
Total	62	99.8

8 There is more than one book chapter related to PCL in a book. However, the research methods of some book chapters are not specified. Moreover, some articles used multi-method. Therefore, the total number in the article list is more than 57.

When the results are analysed according to their theoretical foundation, it is observed that most of articles did not clearly mention the theories used in the content. Optimization research method uses its own theoretical foundation, which is out of expertise of the authors, and thus it is not included within the scope of this study. Some of the studies employs theories such as Logistics Theory, Location Theory, Resource Based View, Contingency Theory, and Game Theory. However, it is clear that there is a need of a generating theoretical foundation for the port-centric logistics approach from a managerial and/or marketing point of view which supports the lack of papers in management (e.g.: logistics, supply chain) and marketing journals.

A further analysis is conducted for the distribution of the keywords according to the disciplines they follow. The list consists of 5 categories covering “Logistics and Supply Chain”, “Economics”, “Information Technology/Information Systems”, “Marketing”, and “Management”. “Logistics and Supply Chain” category includes terms such as supply chain, logistics, container, as well as port-related terms such as port, port selection, and port operation. "Economics" is a category that covers concepts such as economic loss, transaction cost, and cost minimization, while "Information Technology/Information Systems" is a category that consists of concepts such as big data, cloud computing, and automatic identification system. Marketing-specific terms such as value creation, customer satisfaction, and location competitiveness collected under the "Marketing" category, whereas management and integrated management terms are issued under the "Management" category. (See Table 7).

Table 7. Keyword Distribution

Keyword Categories	Frequency	%
Logistics and Supply Chain	129	86.0
Economics	7	4.6
Information Technologies / Information Systems	6	4.0
Marketing	6	4.0
Management	2	1.3
Total	150	99.9

“Logistics and Supply Chain" is the category that covers the most keywords, however; there are few papers in journals focusing on Logistics and Supply Chain. "Economics" and "Information Technologies/ Information Systems" and “Marketing” categories follow ‘‘Logistics and Supply Chain’’, respectively. Although our aim is to group keywords according to the related disciplines, most of the articles include keywords related with the methods used or they highlight the location conducted in the studies. For methods, the most mentioned keywords were AHP, ANP, DEMATEL, optimization, and game model, which supports the higher rates of quantitative studies. Moreover, in keywords, the locations in which

the studies conducted are also listed. Singapore, Hamburg, and Antwerp are the most repeated ones as the mentioned cities have the biggest ports in the world. The next chapter will present results regarding VALS in PCL, which is the main research question of the study.

4.2. Value-added Logistics Services in PCL

The main research question of the study is to investigate VALS within PCL perspective. The analysis presents 46 VALS, and the most mentioned VALS in the prior literature were light transformation and modification (10%), light production and assembly (6.7%), information and communication technologies (5.8%), and packing (5.04%).

Light transformation and customization services include adding and/or changing a product in response to customer requirement (Mendonça and Dias, 2007: 691). Likewise, light manufacturing and assembly is defined as manufacturing and/or assembling some products and/or product parts in a port area. This value-added logistics service is commonly available for goods such as wind turbines and automobiles (Akbari et al., 2017; Mendonça and Dias, 2007), and some ports must provide these services due to local regulatory bodies and cultural drivers (Rodrigue, 2017: 26). Providing this adding-value service may lead to firms reducing the time needed in market entry, thereby achieving a first mover advantage. This also supports RBV which infers that "a holder of a resource is able to maintain a relative position vis-à-vis other holders and third persons…someone already has the resource affects the costs and/or revenues of later acquirers adversely" (Wernerfelt, 1984, p.173).

Information and communication technologies, which cover applications such as tracking and tracing systems (e.g. Munuzuri et al., 2016), barcoding (e.g. Kim et al., 2020), and RFID (e.g. Shi et al., 2011), enable information sharing and data exchange between supply chain members (Eliza et al., 2013: 39). Within these technologies, tracking and tracing systems might be viewed as an utmost distinctive service by a firm as these systems enable traceability. Such a service is needed not only by business partners but also by end customers. For example, a firm may achieve a competitive advantage by offering tracking service to a customer who ordered an automobile from overseas. Moreover, traceability is a very critical technology needed if a product is damaged, or a problem arises. From the point of view of marketing, problems/failures are inevitable while providing services, and the actions that differentiates a company/a port from others are the ones done to respond to a failure (Grönroos, 1998). Thus, apart from tracking/tracing, and informing customers regarding the whereabouts of the freight, the ability to be agile in terms of offering a recovery to a problem/failure takes a port one step ahead of its competitors. In such a case, the dynamic ability to reconfigure resources to create easy and quick solutions, which supports DCV, is key to improve customers satisfaction.

A port is an important hub, an intersection of intermodal/multimodal transport, as well as a logistics centre that manages goods (cargo) and people (passengers) (Bichou and Gray, 2004:53). "Intermodality" here is associated with the connectivity of various transportation modes and nodes (Bichou and Gray, 2004: 51), and it is generally related with infrastructure and superstructure. Therefore, for instance, creating an interconnected facility with other transport modes may create a non-substitutable resource, whereas the superstructure of a port may lead inimitability of the resources and capabilities.

Packing is a protective coating that allows damage-free cargo operations and it is also a transportation requirement for goods like grain. From a theoretical point of view, packing could also be a valuable resource. Accordingly, providing packing services help companies and ports create five rights of logistics (right items, place, time, cost and condition), and form utility which induces competitive advantages (Lambert et al, 1998). According to Porter (1980:37), a firm may improve its competitiveness and earn above-average returns by offering distinctive goods or services. As mentioned above, a port gains a competitive advantage by not only providing traditional services but also providing VALS obtaining VRIN (valuable, rare, inimitable, non-substitutable) characteristics. On the other hand, as the market is unstable, VALS needs to be rearranged by ports according to changing customer requirements and the alterations in the macro and micro-environment, supporting DCV.

These findings gave us the idea to further group the value-added logistics services to provide a more comprehensive understanding and better managerial implications. As mentioned above, the opinions of experts were collected for getting a better picture regarding value-added logistics services.

Figure 2: Value-Added Logistics Services from PCL Perspective

As a result of the expert view, VALS such as "storage at ports", "weighbridges", "warehouse owned and operated by port" and "safety and security services" are excluded based on the consensus of experts. The reason of this exclusion is that these services are the traditional functions of a port, so they cannot be included as value-added inputs. In addition, ‘‘Air and Maritime Logistics Coordination’’ is also excluded from the scope as it is a service offered specifically by one port throughout the world, and therefore it is not a generalizable service for ports. As a result of expert evaluation, VALS are further classified under the categories of ‘‘basic logistics activities’’, ‘‘supportive logistics activities’’, ‘‘specialized services’’, ‘‘connection services’’, ‘‘communication services’’, ‘‘production assembly services’’ and ‘‘custom services’’ (See Figure 1, and for detailed explanations See Appendix 1).

This classification could be used to enhance competitive position of ports. From a theoretical point of view, basic logistics activities could be considered as valuable, however, they can also be imitable if the competitors have the capital. Thus, it will be better to support them with a service that is rarely provided such as cross-docking. Moreover, connection services such as railway infrastructure may give a competitive advantage to a port through inimitability and non-substitutability due to settling at the right place at the right time (i.e.: unique historical conditions).

In general, from RVB perspective, specialized services could include all VRIN characteristics, however, it may be argued that a competitor may also imitate these specialized services in time. For instance, the effect of technology, which constantly changes, cannot be ignored in the port operations. Technologies and infrastructures such as mobile devices, automatic identification systems, big data and predictive analytics, internet of things, blockchain, and cloud-enabled platforms have been used in ports and these could be sources of sustainable competitive advantage (Wamba et al., 2017) through facilitating innovation (Yiu, 2012), better customer relationship management, improving risk management capabilities, resilience, robustness, and visibility increasing efficiency and thus, overall performance (Gunasekaran et al., 2017; Kiron, 2013). The ability to recognize and add these technologies to, for instance, communication services, and reconfigure them when the environment and/or requirements of partners changes could improve a port’s competitive position, whereas missing the developments in technology may lead to dissatisfaction, and thus decreased customer retention rates.

Therefore, this VALS list provided should be regarded as a starting point for ports. They should acknowledge which services they provide and which could be added as value-creators for customers. However, as the requirements of the customers, and conditions of environment changes, port managers/operators should seize the resources/capabilities again to adapt accordingly. The competitive advantage created through resources (VALS in this case) could be sustained only through orchestrating these services as the environment changes.

5. Conclusion

This study's aim is to present a systematic review of VALS from PCL perspective and creating a VALS bundle for PCL depending on a comprehensive analysis. For this purpose, a systematic literature review, covering not only articles but also additional sources such as books, reports, and discussion papers, is conducted to reveal the journals publishing the articles regarding the port-centric logistics approach with their index details, and article-specific details such as research type, data collection tool, research method, theoretical distribution, keyword distribution, publishing years, the countries of most of the first authors' affiliated institutions. This descriptive analysis of literature produces some recommendations for future research.

The study shows that PCL research is in its infancy. The subject is mostly studied in maritime field, and thus the papers published with mostly quantitative methods in maritime journals. However, ports are serving as a serving hub or a factory for several supply chains, having contacts with various partners and operating in a complex, dynamic environment to aid transportation of different products to ultimate customers. Therefore, as the operations run in a port has a multi-disciplinary nature, future research is needed for PCL in diverse fields, especially in logistics and supply chain management, sustainability, and marketing. In terms of sustainability, future studies can evaluate the potential environmental impacts of ports (Bouchery et al., 2020).

Studying PCL through a supply chain lens, future studies can analyse the multi-actor nature of the relationship among the port users benefiting from value-added services offered under PCL view (Bichou and Gray, 2004; Bouchery et al., 2020;) and this could help partners to understand each other's actions and the effects of these actions on other partners in a better way, which in turn, may increase the integration and collaboration between partners, resulting with a better overall performance. Therefore, on the contrary to previous literature, qualitative studies may shed further light on the dynamics of these complex and multi-agent relationships. Researches from services marketing perspective, may help practitioners improve service quality through investing in technical and functional quality as mentioned in Grönroos's model (Grönroos, 1984). This also increases the diversity of theories used in current literature on PCL.

In addition, this study focuses on determining the set of PCL criteria regardless of its cost and other requirements. Thus, studies reflecting cost and other requirements can provide significant contribution to PCL literature (Akbari et al., 2017). Furthermore, PCL approach based on specific cargo types is not addressed in this study. Therefore, PCL perspective can further be analysed by considering specific cargo types such as offshore wind farms (Akbari et al., 2017), vehicles (Dias et al., 2010) and perishable cargoes (Filina-Dawidowicz and Wiktorowska-Jasik, 2021). Similarly, as PCL criteria and its related applications can change

and vary in different regions and countries, studies addressing PCL from region-specific and country-specific perspective can contribute to increase the set of PCL criteria (Haralambides et al., 2011; Yang et al., 2013; Güneş and Esmer, 2016; Heitz et al., 2020; Filina-Dawidowicz and Wiktorowska-Jasik, 2021).

Using RBV and DCV as foundations of the study is another contribution to the field. Despite being a popular theory, PCL literature rarely use these theories. The reason could reside in the criticism of RBV which states that RBV fails to offer applicable measurement to resources (Lockett et al., 2009). This also supports the high number of quantitative studies in the field. However, RBV and DCV identify bundle resources having VRIN characteristics which may lead to competitive advantages. Accordingly, this study contributes to the literature by providing a list of resources for ports (i.e.:VALS from PCL perspective).

As for the main purpose of the study, the results indicate 46 different types of services reformed through gathering expert opinions. The final VALS list is based on seven titles including basic logistics, supportive logistics, specialized logistics, connection, communication, production and assembly, and customs services. Within these services, light transformation and customization, information and communication technologies, packing, light manufacturing and assembly, and intermodality are the most frequently used criteria. These most frequently mentioned services come from different headings (See Figure 1), however light transformation and customization, light manufacturing and assembly, intermodality, and packing indicate that the studies produced in this subject mostly focus on the physical flow in the ports.

In practice, by offering VALS, a port may expand its customer base which may include many industries, including automotive, textile, and white goods. These industries may benefit from time and speed savings by shifting some activities (such as packing, light transformation, customization, light manufacturing and assembly) outside their plants, and have more resilience, which are both valuable and non-imitable for customers. Although different ports may provide these services, the time advantage and quality created depend on the workforce and their capabilities which is gathered/orchestrated by managers/operators in port. This also supports Sirmon et al.'s (2007) view on the importance of top management's capability building via orchestrating resources.

From the theoretical lens of RBV, most ports are not able to provide the most frequently mentioned services due to such barriers as land limitation, cost restriction, and qualified human resource requirements, ports with these resources become distinctive. The categories of specialized services and production assembly services cover very exclusive services dedicated to specific product groups such as vehicles and white goods. Within these categories, quality control and testing service, light manufacturing and assembly, and light transformation and customization require high initial investment costs, available land area, and

a qualified labour force. Similarly, PDI and multi-story car parks listed under the VALS category of specialized services are dedicated to vehicle manufacturers and few ports can have the potential to provide these services in terms of mentioned limitations. Most of the ports do not have any freight village connection and intermodality due to similar deficiencies, as well. Considering this situation, ports increasingly focus on a specific cargo type and deploy their limited resources for a relatively small-scaled market (Gülcan et al., 2014; Turbaningsih, 2022; Park et al., 2023). Ports that can make such big investments have a competitive advantage from the theoretical lens of RBV. In terms of DCV, such an advantageous position can be strengthened if these resources are improved and reconfigured by observing market-specific trends.

Information exchange executed regularly and precisely is another important value-added logistics service supplied by a port, since it keeps its customers on the land side and the seaside informed and simplifies their supply chain routines. Therefore, information and communication technologies are another frequently mentioned VALS which emphasizes information flow. As mentioned above these technologies facilitate innovation, better customer relationship, improved risk management, efficiency, visibility, and thus overall performance of ports. For instance, the estimation of a resource's future value by managers may develop competitive advantages over competitors (Kraaijenbrink et al. ,2010). Thus, for instance, adapting big data analytics and blockchain in a port in East Mediterranean enables the improvement of ports' competitive positions as most of the multinational companies (e.g. Amazon, Alibaba, Samsung, etc.) have already been using these technologies. Easy adaptation with the systems of these companies will increase the market share of ports, and help finding new customers.

RBV acknowledges that it is not possible to create competitive advantage only with resources (Gunesekaran et al., 2017). To sustain the competitive advantage gained by VRIN characteristics, ports should add and/or transform the resources, capabilities, and services they provide. As a result, a port may be able to better position itself in the competitive environment. Additionally, addressing these services through the lens of dynamic capabilities contributes a port in terms of flexibility, agility, and resilience (Lessard et al., 2016). A port might generate resources that are difficult to imitate through reconfiguring VALS considering consumer requirements and recognize and/or capitalize on opportunities and avoid environmental threats in a dynamic market.

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Appendix 1: VALS from Port-Centric Logistics Perspective

Basic Logistics Activities	**Definition**	**Reference (Author/ Year)**
Logistics Park	Availability of a logistics park that is intended for the management, distribution, and transportation of different products.	Cao, 2019; Chen and Notteboom, 2012
Distribution Center at ports owned by shippers	Availability of distribution centers at port or its close vicinity owned by shippers.	Demirbaş et al., 2014; Mangan et al., 2008; Monios and Wilmsmeier, 2012
Dry Port as an Extension to an Existing Seaport	A dry port creates a direct link between inland intermodal terminal and a seaport(s). It employs high-capacity transportation means, particularly railway, and customers can leave and/or get their orders through these places as if they were going straight to/from a seaport.	Wang et al., 2018
Multi - Tenant Logistics Platforms	Availability of logistics platforms used by multiple port users on a joint tenancy basis.	Monios et al., 2018
Warehouse at port/ located in close vicinity of port and operated by shippers	Availability of warehouse, that is operated by shippers, located at seaport or its close vicinity.	Heitz et al., 2020; Mangan et al., 2008; Monios and Wilmsmeier, 2012
Purpose-built Warehouse Located in an Offshore Distribution Center	Availability of warehouse located in an offshore distribution center owned and operated by large shippers to store and customize their basic products at port area or its proximity.	Monios and Wilmsmeier, 2012
Empty Container Depot	Availability of a depot dedicated to empty container storage within the port area.	Heilig and VoB, 2017; Roso et al., 2009
Cold Storage Facility	Availability of refrigerated facilities dedicated to keeping perishable goods such as fruits, vegetables, and chicken fresh within the port area.	Filina-Dawidowicz and Wiktorowska-Jasik, 2021; Rodrigue, 2017
Distribution Park	Distribution parks, (i.e., distri-park) are the centers including facilities for all types of distribution activity and providing such added value services as assembling, labeling, repacking, storage, and stripping and stuffing of containers.	Acciaro and McKinnon, 2013; Geerlings et al., 2018
Seaport - Dry Port Dyad	Availability of integrated logistics service depending on a joint management form of a seaport and a dry port connected each other.	Jeevan et al., 2019; Roso et al., 2009; Santos and Soares, 2017
Inventory Management	Availability of management service enabling goods can be stored in the designated port areas and orders can be organized.	Güneş and Esmer, 2016; Kim et al., 2020; Rodrigue, 2017; United Nations, 2002

Supportive Logistics Activities	**Definition**	**Reference (Author/ Year)**
Cross - Docking	Availability of unloading goods from a truck or railroad car and then reloading to outbound trucks and trains by eliminating supply chain's storage link.	Monios et al., 2018
Cargo Classification	Availability of distribution of cargoes carried by their sections, groups, types, positions, and destinations within the port area. This activity also covers sorting service offered.	Bouchery et al., 2020; Kim et al., 2020; Monios et al., 2018
Cargo Consolidation - Deconsolidation	Consolidation is the technique of uniting many small shipments from various cargo owners into a single truck or container to be transported together. In deconsolidation technique, instead of uniting shipments from various cargo owners into a single transport, various items from a single cargo owner will be divided up into smaller groups and carried to their end destination singly of each other.	Bouchery et al., 2020; Venkatesh, 2020
Packing	Availability of packaging service of components or finished goods by managing damage-free cargo operations.	Chen and Notteboom, 2012; Geerlings et al., 2018; Güneş and Esmer, 2016; Kim et al., 2020; Venkatesh, 2020; Zhou, 2020
Repackaging	Availability of repacking service of components or finished goods to carry out cargo operations problem-free.	Geerlings et al., 2018; World Bank, 2007
Re-use	Availability of container reuse service.	World Bank, 2007
Palletization	Placing products on pallets to enhance and ease future shipment.	Bouchery et al., 2020; Geerlings et al., 2018
Stripping/Stuffing	Availability of emptying imported cargoes from containers and loading exported cargoes to containers.	Bouchery et al., 2020; Monios et al., 2018; Roso et al., 2009
Specialized Services	**Definition**	**Reference (Author/ Year)**
Cleaning Facilities	Availability of facilities dedicated to container cleaning within the port area.	Heilig and VoB, 2017; World Bank, 2007
Container Repair and Maintenance	Availability of container repair and maintenance service within the port area.	Heilig and VoB, 2017; Roso et al., 2009; World Bank, 2007
Pre-delivery Inspection (PDI)	Availability of final control service of a car to make sure it is working mechanically without any defects and prepared for a safe drive.	Dias et al., 2010; Mattfeld, 2006; Mendonça and Dias, 2007

Logistics Company owned by Seaport and that has Trailer Fleet	Availability of a logistics company with a fleet of trailers owned and operated by the seaport.	Mangan et al., 2008
Trailer Renting and Leasing	Availability of trailer renting and leasing services by a seaport.	World Bank, 2007
Multi Storey Car Park	Availability of a multi-story vehicle parking facility used in vehicle transshipment operations within the port area.	Mattfeld, 2006
Parking Facilities	Availability of final control service of a car to make sure it is working mechanically without any defects and prepared for a safe drive.	Mendonça and Dias, 2007; World Bank, 2007
Buffering	Availability of a parking space dedicated to car manufacturers to be parked their cars when the parking spaces at the seaport are full.	Dias et al., 2010; Mendonça and Dias, 2007
Offices/World Trade Center (WTC)	Availability of office buildings dedicated to the cargo-related parties and trading centers to make business contacts.	Akbari et al., 2017; World Bank, 2007
Hotels, Restaurants, Shops	Availability of hotels, restaurants, and shops to meet port users' accommodation, food and beverage, and various shopping needs.	World Bank, 2007
Repair and Maintenance	Availability of repair and maintenance facilities dedicated to damaged containers and roll-on-roll-off cargoes.	Roso et al., 2009; World Bank, 2007
Truck Maintenance and Repair Facilities	Availability of truck maintenance and repair facilities.	World Bank, 2007
Connection Services	**Definition**	**Reference (Author/ Year)**
Freight Village Connection	Availability of connection between an inland freight village and a seaport.	Iannone, 2012
Intermodality	Availability of port infrastructure and superstructure elements complying with intermodal transportation requirements.	Beresford et al., 2004; Bichou and Gray, 2004; Bouchery et al., 2020; Eliza et al., 2013
Railway Infrastructure	Availability of railway infrastructure elements within the port area.	Acciaro and McKinnon, 2013; De Martino, 2015
Communication Services	**Definition**	**Reference (Author/ Year)**
Information and Communication	Adequateness of a seaport in having and disseminating information to provide effective and efficient service.	World Bank, 2007

Information and Communication Technologies	Adaptiveness of a seaport to information and communication technologies such as tracking and tracing systems, RFID, and barcoding.	Beresford et al., 2004; Eliza et al., 2013; Kim et al., 2020; Mattfeld, 2006; Monios et al., 2018; Munuzuri et al., 2016; Shi et al., 2011
Production Assembly Services	**Definition**	**Reference (Author/ Year)**
Quality Control and Testing Service	Availability of quality control testing services provided to products.	Mendonça and Dias, 2007; United Nations, 2002; World Bank, 2007
Light Manufacturing and Assembly	Availability of light manufacturing and final assembly service to some product components in the dedicated facilities located in the port area or its close vicinity.	Bouchery et al., 2020; Chen and Notteboom, 2012; Dias et al., 2010; Geerlings et al., 2018; Güneş and Esmer, 2016; Kim et al., 2020; Mattfeld, 2006; Mendonça and Dias, 2007; Monios and Wilmsmeier, 2012; Monios et al., 2018; United Nations, 2002; World Bank, 2007
Light Transformation and Customization	Availability of facilities and service areas located in the port area to offer additional services and alterations to a basic product according to the consumers' demands like labeling.	Akbari et al., 2017; Chen and Notteboom, 2012; Güneş and Esmer, 2016; Mattfeld, 2006; Mendonça and Dias, 2007; Rodrigue, 2017; United Nations, 2002; World Bank, 2007
Custom Services	**Definition**	**Reference (Author/ Year)**
Customs Facilities	Availability of facilities dedicated to carrying out statutory checks with minimal impact on the logistics process within the port area. In these facilities, import and export documents are submitted by relevant parties such as freight forwarders, importers, agents, shipping companies, terminals, and transporters.	Chen and Notteboom, 2012; Güneş and Esmer, 2016; Roso et al., 2009; World Bank, 2007
Inspection	Availability of cargo-related test and control service areas.	(Kim et al., 2020)