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## RESEARCH ARTICLE

# Seaport Concept and Services Characteristics: Theoretical Test

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### Abstract:

#### Introduction:

The main purpose of this paper is to illustrate the meaning of seaport concepts with different vision, than to examine the characteristics of transport services which are related to the seaport services and their users.

#### Concepts:

The study shows that seaport concept is in evolution over time and also, is a relative concept which is changing among the world process shifting and development.

#### Conclusion:

The study proves that the transport services have distinctive characteristics. In addition, seaport considered several services for different users. Therefore, its customers are commonly the chargers and ship-owners.

**Keywords:** Seaport concept, Evolution of seaport, Services characteristics, Socioeconomic changes, Maritime transport development, Port development.

## 1. INTRODUCTION

Ports are the main industrial and commercial tools for economic and social development of the countries. The port sector is touched by the socioeconomic changes characterized by the requirements development in the countries, through commitments by the countries of free trade and the new contexts of globalization, to the new constraints and developments economic, institutional, technological, environmental and maritime transport development. Therefore, the seaports have always been disposed to changes in socioeconomic trends. These developments have created a highly uncertain and complex environment for ports and fundamentally changed the port concept.

The seaport is a multidimensional system combined between economical function, infrastructure system, geographical space and trade. In addition, a seaport is managed under a complex legal concept and managed through an organizational model that mostly generates the need for convergence of the public and private sectors [1]. The intention of this study is to collect the different conception of seaport concept and demonstrate that has come about over time and over countries. In the literature review, some research focused on the port governance or port reforms as Wang [2] was among the first to consider governance structures in addressing container port systems on a regional scale. This argument was elaborated in collaborative document flows that followed.

The study of Wang and Slack [3] pointed out that regional forces of redistribution of traffic are complicated by institutional reforms, as a private terminal operator in the hub port, can have simultaneous peripheral installation. In addition, for political circles in a region the system may have spatial concentration or de-concentration effects beyond

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market forces only [4]. Recently, Wang and Olivier [5] have shown how the institutional integration of the Chinese port system has diverted the container-port development from the linear morphology proposed in Any-port. Thus, in particular, these the authors show how government policies place emphasis on spatial alignment between new deep water container facilities and special economic zones. Others authors provided an empirical study about port development as Yip *et al.* [6], showed the growth of terminal operators in the context of port management with the application of stochastic frontier model. Liu *et al.* [7], analysed the recent development of a port system in the Pearl River Delta, which founded an evolved system from one stage to another. These two researches showed the important assessment of the fifth generation port.

The seaport products offer various services, which make each service distinct. There is however a lack of studies that discuss the seaports concept and its services. Thus, this paper aims to concentrate on this lack in the literature by presenting and defining the seaport concept and by examining the different characteristics of its services. Exactly, this paper search the flowing interrogations: what is a seaport? How it can be defined? Which services seaport can produce? What are the characteristics of transport services? Who are the customers of port?

## 2. SEAPORT CONCEPT

In a changing international environment, maritime ports have undergone radical changes, especially in terms of organization and structure. Within this framework, the port has passed mainly through four generations. It is important to define the seaport concept and to determine its classification. In a broad sense, the seaport is a place of exchange between sea and land, it is a geographical area to receive ships and goods.

Paul Tourret [8] defined the port, in its traditional conception, as a set of moles, basins and docks, which prove to treat all kinds of ships and goods. Beyond the terminological meaning, the seaport can be defined according to different approaches such as economic, geographical, legal and institutional. In a more restricted sense, the port definition has been dealt in several ways.

### 2.1. The Economic Conception

According to the economist Bauchet [9], the port is defined as “the place where the ships are sheltered, also the place where the goods pass, or even where they are transformed”, this definition designates the port by its three essential functions. The first two form the port function itself. The port is home to the ship. The power and gigantism of contemporary ships conceal this first role. The port permits the handling necessary for the transfer of the goods or passengers, from one mode of transport to another, from the ship to one of the terrestrial modes or *vice versa*.

Ports and shipping are foremost tools of international trade. There is a reciprocal growth, world trade in volume, tonnage transported by sea, tonnage handled in ports and the world fleet. This interdependence has been demonstrated empirically and theoretically by numerous authors, for example Bauchet [10] and Vigarié [11]. From the end of the Second World War to date, world exports have grown significantly. Trade by sea is becoming the most widely used. The growth of maritime transport has been one of the factors that have made possible the expansion of international trade.

In addition, with these two port functions commercial and industrial functions can also be added. Commercial activities are necessary to carry out all operations connected with the passage of ships and goods in the port. The activities addressed for the ship are the preparation and the realization of the stopover. The activities addressed for the goods are the customs clearance procedures prior to their removal from the terminal.

In the economic sense, the port is a complex system composed of a set of material and immaterial elements, destined for the service of ships and goods. The tangible and intangible elements that make up are port infrastructures, port superstructures and tools or equipment.

Indeed, in order to render services to ships and goods, the port uses several elements in order to function. First of all, shipbuilding infrastructure consists of basic heavy infrastructure, which allows ships to access a preserved station in the docks and docking stations where ships dock during the port execution period. Subsequently, goods handling equipment, known as superstructure or tooling, is used to load and unload the goods from ships accosted to the ground and screw to that.

### 2.2. The Geographic Conception

The geographer favors a definition that highlights the specificity of the place “port” not in relation to the functions

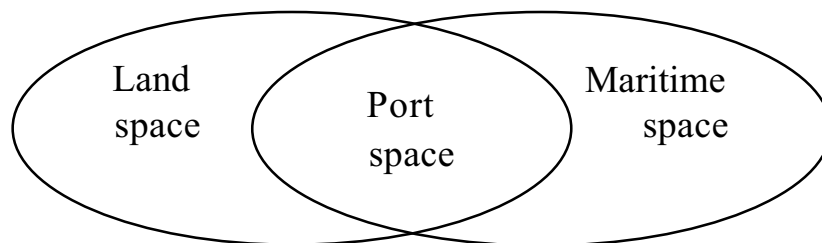
that are carried out there but in relation to the rest of the earth's surface. For example, Vigarié [12] defines the seaport as an area of contact between the two domains, the land traffic and the maritime traffic, with its role is to ensure a solution of continuity between two transport schemes adapted to crossing two spaces with different characteristics.

The geography words (1992) define it as “a place of transshipment of persons or goods between land and water”, an interface between sea and land, between maritime circulation space and land circulation space. It is therefore “a plane or line of contact between two systems or two distinct sets”.

More recently, Vigarié [13] has stated that a port is foremost a contact area between two organized spaces for the transport of goods and passengers. These two spaces are land and sea the port being a third ensuring the transition organized for traffic, it is:

- Structured by equipment for the land and sea routes for the port: basins, quays, *etc.*
- Driven by flows of goods that can be attracted with varying degrees of efficiency;
- Used according to various modes of instruments, road policy, armament policy, port policy.

It can be concluded that seaport is the third space in the geographical conception as Fig. (1). described. The port is the intersection between the land and the sea.



**Fig. (1).** The three space in maritime transport. Source: Own elaboration.

More recently, Notteboom and Rodrigue [14] presented an evolved port system model that describes the port and dynamics of networks. One of the most recognized conceptual perspectives on port development is the 'Any-port' model developed by Bird [15]. It describes how port infrastructure evolves in time and space. From the original port location with small side docks close to the city center. The extension of the port is made either by the evolution of the maritime production technologies or by improving the handling of the freight. This is also marked by the evolution of spatial relations between the port and the urban areas.

Morgan [16] started to establish the morphological characteristics of the ports. In the same context Bird [17] studied the “Any-port” model, which lasted four decades of theoretical and empirical challenge. The bird designed the port following a direct relationship between form and function and, in Any-port, the port area is considered a chronological and linear succession which separates the development phases. Bird concerns were primarily concerned with how the morphology of the port has come to interact with the port.

With Any-port as a theoretical case, the historical approach was developed by [18], Hoyle [19] to explain the increasing separation of the port of the city. More recently, Charlier [20] continued with modeling the urban port spaces suggest the concept of port life cycle.

The search for structural conformities rather than local differences planned as the main epistemological discourse in port geography until the 1990s, when institutional change became such that it was no longer possible to assume the heterogeneity of governance structures in performance analysis the way in which the public monopoly model had traditionally allowed.

Geographers who are interested in maritime transport prefer to define the port as a reference point for all researches, the place from which it is possible to understand the impulses on land, sea or port that will govern the organization of maritime life.

### 2.3. The Legal Conception

The legal status of the port authority can be public or private. There is no definition of a port in the law context. Thus, below the article 1 of the Geneva Convention of 9<sup>th</sup> December 1923 on the international regime of maritime ports,

“All ports which are normally frequented by sea going vessels and used for foreign trade shall be deemed to be maritime ports”.

The legal regime of port management depends on the kind of traffic received by the port and on the degree to which the port is institutionally dependent on the state or a local authority. The regime cannot always be clearly determined simply on the basis of a port’s status.

The legal regime of a port depends also on the will of the state adopting a global approach, sees to it that the port system makes the best possible contribution to the country’s development, or, adopting a local approach and regards the port as an economic entity which should operate by its own.

An economic and political strategy is then usually preserved in instruments, which take the form of laws where principles are concerned and regulations implemented. Constitutional system designates the authorities empowered to adopt such instruments. The rules generally vary according to the state whether a unitary, federal or a confederal state and having regard to the degree of decentralization and especially to the legal systems in force in the country concerned.

**2.4. The Institutional Conception**

The institutional regime of ports depends on how they are defined and the kind of traffic they receive. For J.G. Matons [21] a port is “a place on the coast specially designated by the competent administrative authority to serve the purposes of seaborne trade”. The port is an institution with or without a legal personality, responsible for exercising public works, police or other powers in the geographical and legal space. In the same meaning, B. Steck [22] defined ports as “service companies, at the center of the logistical chain which organizes world trade, to allow the flow of traffic, even capturing and raising it. In order to respond to changes in the world economy, in particular to changes brought about by technological dynamics, ports must offer an increasing number of services which involve specific equipment in constant renewal”.

The port is a place of economic activities, it is a place of exchanges where goods and people circulate. Thus, one distinguishes between a port of the various activities more or less developed according to the economic activity and the stakes of the region. These activities affect the structure of the port and its vicinity.

**3. DEFINITION OF SEAPORT FLOWING THE TIME**

The definition of port has evolved over time as Fig. (2) show. The evolution is discovered by fourth generations, which explain that the economic, geographical, technological, and international trade transformation and container ship fleet development influenced the meaning of the seaport concept over time.

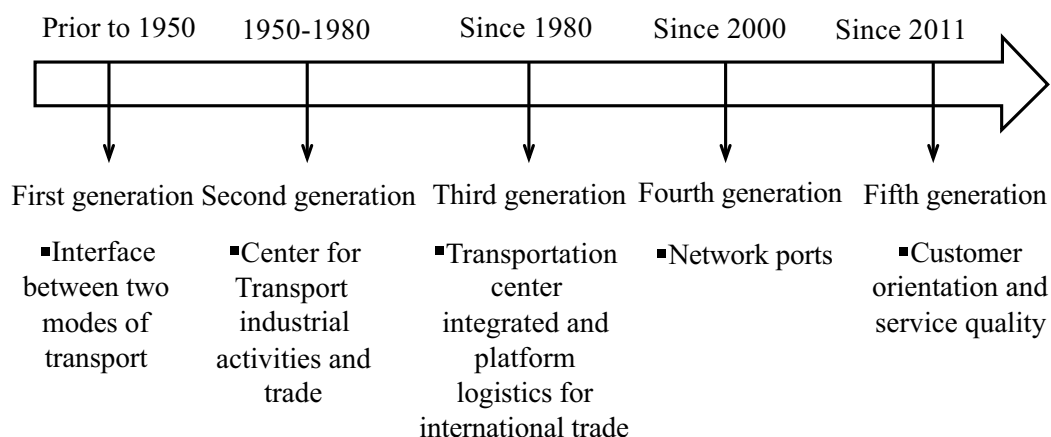


Fig. (2). Evolution of seaport concept Source: Own elaboration.

For the first generation, the ports were essentially interfaces between the land and the sea in goods transport. Their role was then focused on the subsequent activities, the loading and unloading of ships, storage and delivery/receipt of merchandise.

For the second generation, port and port service providers have an imperative role in the global port functions. The port is considered a service center in the transport sector, industry and trade. It can consequently implement and offer its

users industrial or commercial services which are not directly linked to traditional activities of loading/unloading but which are indirectly through the logistical facilities offered by the port.

The third generation ports are owing to the global expansion containerization and intermodalism, jointed to the growing demands of international trade. The decision-makers, managers and operators of a port of the third generation have dissimilarity from the operation and development point of view for which they are responsible. They perceive the port as a dynamic link in the international production and distribution system. Their behaviour has evolved accordingly.

The fourth generation ports are characterized by internationalization and diversification on the basis of the network system, which attaches many port areas and permits the cooperation with other ports. These are named as network ports. These ports are integrated as international transport logistics chain, practicing door to door services with other logistics operators working in several geographic areas close to the ports.

Furthermore, recently some authors also discuss about the fifth generation ports, as Flynn *et al.* [23] Lee and Lam [24], and Lee *et al* [25]. The new concept of seaport is about the customer services. The port is expected to provide services at a higher levels by using market mechanisms, incentives, and government policies. Customer orientation (satisfaction), and service and technology are vital factors for the fifth generation ports. The customers have been the center of attention from of the seaport from a long time, however, the fifth generation encourages these relationships because they would be focusing on the ports users (shipping lines) may capture more clients with low emission per TEU performance and focusing on the ports system which can in return attract more clients with services meet th stakeholder request and achieve a high competitiveness.

It argues that the fifth generation port has a stronger focus on customer requirement port throughput the supply chain logistics and networks as it is described by Notteboom [26]. This requires the development of communication strategies that clearly articulate the port service offering and value proposition to customers and a port marketing framework aimed at enhancing customer loyalty and measuring customer's satisfaction in a highly dynamic and competitive port environment. Consequently, in the next paragraph, we decided to explore the different services of seaport the important role that port plays in services provided to the customers. As we answer some questions, for example? What are the characteristics of transport services? What are the port services? Who are the customers of port services?

#### **4. THE CHARACTERISTICS OF TRANSPORT SERVICES**

As noted by Michel Didier [27] the transport services admitted several specific characteristics.

##### **4.1. Transport is an Intermediate Consumer Service**

A transport service is rarely required for itself. It is an auxiliary to other activities, such as vacation or production. The demand for transport can only be understood in relation to the way of life or of the production activities, especially its technical and spatial structure.

##### **4.2. The production of Transport Services Requires Immense Capital**

Automated transportation involves capital (roads, railways, trucks, locomotives, aircraft, *etc.*), inputs (fuels, electricity), labor (truckers, railway workers, Pilots), and time. The share of capital is considerable in both infrastructure and transport equipment.

##### **4.3. Transport Infrastructure is Characterized by a Long Service Life**

Infrastructure can stand for decades or centuries. A characteristic that is affirmed is the length of the construction period. For technical reasons, it takes several years to build a complex structure. Furthermore, for socio-political reasons, it takes even longer to get the principle accepted to construct a road or a railway line between the decision to create an infrastructure and its starting.

##### **4.4. Requires a Large Part of the Work**

Transportation requires a large part of work outside any walk of the users themselves who drive their own vehicles. Transport is thus self-consuming that is badly appreciated by national accounts and often forgotten in economic reasoning.

#### **4.5. Transportation Takes Time**

Time is essential in transport, where speed is an essential attribute. One of the essential elements of the choice of means of transport is the time savings generated.

#### **4.6. Transport Recovers a Multiplicity of Distinct and Non-Replaceable Services**

The concept of the transport market is a hazardous abstraction. It combines different services and fields of activity in terms of demand, supply, technology and cost. The idea that the same transport policy can be applied to steel transport, air travel and commuting is illustrated. To understand and act decisively to break down the transport market between different transport services are not substitutable. This observation shows that no mode of transport is superior to another. It depends on the path and the need for the user.

#### **4.7. The Transportation Market is Shared by the Geographical Dimension**

For most goods a production made in A or B is equivalent. The same is not true of transport. Supply or demand in A and B cannot be integrated. Over capacities in A does not compensate for an under capacity in B.

#### **4.8. The Distance Continues to Count**

Frances Cairncross [28] referred to the death of distance to talk about the remarkable reduction in transport and telecommunication costs associated with revolutions in transport and information technologies. In reality, distance continues to be an obstacle to introducing a viscosity into economic relations between spaces.

#### **4.9. Transport is a Service that Calls for Political Intervention**

Transport is a service for which political intervention is frequently justified (but poses a problem of optimality). Compared to the theoretical model of the perfect competition market, transport markets can be considered to be quite imperfect.

#### **4.10. Transport Infrastructure has the Character of Public Goods**

Transport infrastructure often has the character of a public good and involves expropriation for public utility. Pollutant emissions from vehicles require control and limits. Transport is a good whose social and redistributive implications are important. For all these reasons, transport involves public intervention.

#### **4.11. The Transportation System is a Complex Whole**

To analyze the relationships between infrastructure, mobility and growth and to inform policy, it is serious to consider the systemic nature of transport. The transport system is characterized by a certain sharing of modes of transport, certain mobility and processes for public finances. This situation influenced the economy and society. Good mobility increases productivity and gross domestic product. All the elements of this system are influenced by transport policies. Understanding transportation means understanding how the elements of this system work in its relationships with others.

#### **4.12. The Transport Sector is an Area where Perception Errors are Highly Developed**

The transport sector is an area where perception errors are highly developed as determined by comparisons between perception and reality. The economic dimension is often poorly taken into account in transport data and reasoning.

We also recall that Maurice [29] presented a characteristic of a transport service which is:

#### **4.13. Transportation Services are Non-Storable and Non-Transportable**

A specific transport operation presupposes an object and means of transport for it to take place. It is essential that certain relations should be established between the economic unit with decision-making authority over the movement of this object and the economic unit with decision-making power over the mobile means of transport to be used. We call "transport service" the carrying out of a transport operation under specified conditions. These conditions may relate in particular to the place and time of departure, the place and time of arrival, the comfort during the journey, *etc.* the Table 1 recapitulate and state again the main characteristics.

**Table 1. The Characteristics of Transport Service**

The transport service	Is intermediate consumption service
	Its production requires immense capital
	Its infrastructure is characterized by a long life
	Requires a large part of the work
	Transportation takes time
	Recovers a multiplicity of distinct and non-replaceable services
	The transportation market is shared by the geographical dimension
	The distance as a count continues
	The necessity of political intervention
	Its infrastructure has the character of public goods
	The transportation system is a complex
	The transport sector is an area where the perception errors are developed
	Transportation service is both non-storable and non-transportable

Source: Own elaboration

**5. PORT SERVICES AND CUSTOMERS**

The port services have various the different functions. The port can operate during the processes of production. The services of ports are generally offered to the ship and the goods. Therefore, port services are services of a commercial nature which are supplied for consideration to the users of the ports. The price of these services is not generally included in the charges levied to be allowed to call or to manoeuvre in a port. The quality, efficiency and cost-effectiveness of port services determine the overall level of service provided by the port. These elements are aspects of the decisive factors of competition in the ports of the community to attract customers.

Port services are always provided under a regime of exclusive rights and/or monopolies of public or private nature. The provision of port services of a commercial nature is governed by the competition rules, as well as, by the rules instituting the fundamental freedoms, freedom of establishment and freedom of movement of workers, goods and services. However, there are a number of aspects specific to ports:

- Ports may be limited in space;
- Ports have a specific role in the implementation of community customs procedures;
- Ports have a responsibility in sea safety and on land and in the environment protection.

All the services provided to the ship and transported to the port goods (handling, warehousing, customs, insurance, etc.). Thus, their contribution can be distinguished between:

- Ship services
- Goods services
- Administrative services
- Handling services
- Terrestrial transport services.

Table 2 summarized the different services with their explication.

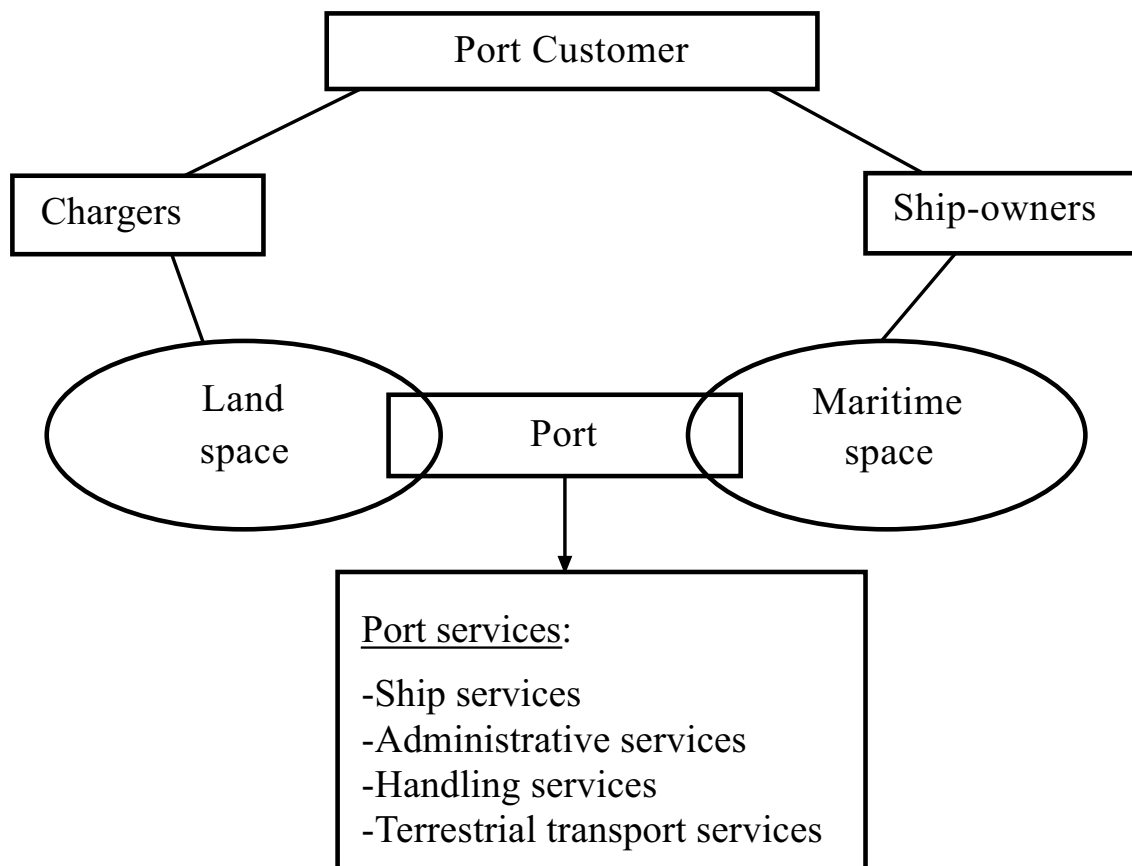
In addition, the first customers of the port services are ship-owners. They equip and operate ships for commercial purposes. The ship-owner is the person who equips and operates a ship. He armed the ship, supplied it with equipment and all that is necessary for the exploitation and shipping. The second customers are the chargers or the terminal operators. They are the owner of a commodity, the one who ship products in the framework of an international operation.

The Fig. (3) recapitulates the different fields of seaport studied in this paper. Consequently, the port is an interface between maritime space and land space. Its customers are generally the ship-owners in the maritime side and the chargers in the land side. Therefore, the port offered different services as the goods and ship services, administrative services, handling services and terrestrial transport services.

**Table 2. The various seaport services.**

Seaport services	ship services	It is the companies that intervene to assist the ship during its stopover for example: the pilots, the tugs, the gliders, the consignees or shipping agents who represent in the port the ship-owner or the charterer of the vessel, the fuelling and bunkering companies, the ship repair companies, the container maintenance, the ship waste recovery companies and the shore services for seafarers
	goods services	They include all the intermediaries whose aim is to assist logistics (physical, informational and financial) of the goods (freight forwarders, the consignees of the goods, the customs brokers, grouping, storage, testing companies sample analysis, surveillance and security).
	administrative services	They are composed both of the port authority responsible for the management of port installations and equipment and other administrations representing the state (customs, border police, health, social assistance, services fire and security etc.) which will be developed in the part of the main port users as the part of the port logistics chain that ensures the arrival and departure of ships and goods on the port platform.
	handling services	This is also called “Stevedoring”, which refers to all the loading and unloading of trade ships, in the ports of the handling operation shall be carried out by undertakings which ensure the interface between water and ground, they also carry out reception operations, recognitions and guarding of goods.
	terrestrial transport services	It is the road, rail, and inland waterway transport companies that goods on the ground are referred to as pre-routing and of post-routing

Source: own elaboration.



**Fig. (3).** port concept, costumers and services source: Own elaboration.

**CONCLUSION**

The seaport is a complex system with multifunctional operations thus making it difficult for the authors to analyze its meaning explicitly. Thus, every one defined the seaport accordingly to their field and knowledge.

This study provided numerical syntheses which indicated the importance of theoretical analysis in seaport sectors, these syntheses are summarized as follows:

- The sea port concept has evolved over time with the relative change of the world economic, technological and environmental.



- The services of transport sectors are particular in several characteristics which make the services of seaport complex.
- The users of seaport services are not direct customers, hence, the study shows that the principal users of seaport services are the ships and goods
- The services founded for the customers are indirect services.

Finally, in the context of globalization, a port may be able to serve customers and be more competitive. This paper pointed towards a fact that the seaport today is its customers, however, it does not analyze how to make changes so as to maximize customer's satisfaction, keeping in view the constraint of a large profit. The seaport is a response to customers who want to carry out their routine operations easily when they want and without any security concerns because they know that the port authorities deal with such issues. At the same time, there is a growing need for advice because of the diversity of destination, the multiplication of products and the erratic evolution of the financial markets which are confusing. This initiates the development of a traditional relationship that binds the customer to the seaport, and the essential concerns revolving around the different destinations of the seaport of this new relational model.

### CONSENT FOR PUBLICATION

Not applicable.

### CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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