

## Barcelona Treball

### Summary of sector trends: Sea Transport

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# The evolution of sea transport: 4th generation ports

The 4th generation ports are logistics platforms with security and communications systems at the highest technological level. Also called network ports, are able to integrate into a multimodal transportation network. They have business and management units, and a growth and expansion strategy in common with other ports that are similar.

Ports are strategic nodes that facilitate the flow of goods in the international arena, as a part of an extensive logistics network over which trade and exchange of information is established between points and / or distant geographical areas. Within port management the fields of strategic planning, marketing, logistics development and business management have broken through, following the same trend as other productive areas. Thus, **ports evolution has changed its management forms, which are turned to be structured into four levels** (1st, 2nd, 3rd and 4th generation).

1st generation ports were conceived to transport goods between land and sea and vice versa, through a local or regional hinterland (area near the port that serves as a route for goods sales and distribution), unrelated to the socioeconomic environment of the territory where it was located. The 2nd generation ports begin to be seen as a transportation hub and a center of industrial and commercial activity. Services are limited to ships and goods but in its vicinity processing industries are installed. These are called industrial ports. The 3rd generation ports incorporate logistics functions related to the distribution of goods in services, data processing and use of telecommunications systems, and help to generate added value.

The 4th generation ports make a step further and are characterized by telematic networks (communication networks based on new technologies) that connect different port areas and allow the collaboration with other ports, with the objective to internationalize and diversify their activity. These are called network ports. These ports are integrated into the international transport logistics chains, door to door services with other logistics operators working in several geographically nearby ports.

Thus, a **4th generation port is a big magnitude logistics platform**. It has intermodal terminals or dry ports, **connected to the seaport, and are situated in consumer goods environment with regular rail connection and competitive costs, allowing the transportation of large volumes of goods to the distribution chain.**

Additionally, the new network economy transforms the classic positions of port logistics chains and gives them value. In this new context, there have been significant changes in port operations, which reduce the time of loading and unloading and door to door transport. In this regard, **the 4th generation ports are connected with other ports and are characterized by:**

- Development of internationalization strategies and diversification of its activities that allow, for example, the transportation of goods to any place in the planet.
- Provision of a logistics organization that makes its facilities attractive and efficient for the transportation of goods.
- Provision of electronic data interchange (EDI) networks integrated among port areas.
- Looking for port areas distributed abroad.
- Cooperation with other port communities.

<sup>1</sup> Impact of New Technologies in port management. An empirical approach. Pablo Coto Millán, Miguel Ángel González Fisheries, John M. Castanedo Galan, Ramon Nunez Sanchez. University of Cantabria. 2010.

## Impact on the sector

The state-owned **port system** has developed a new culture based on policies to enable a framework of free competition where different operators make an effort to provide the best money value service. It **has driven the field of innovation to increase competitiveness and improve procedures and services in Spanish ports, turning them, steadily, into 4th generation ports.** In short, it has established a model of public-private partnership with the goal of generating ports that are part of an integrated intermodal transport (involving the transport of goods using two or more media), sustainable, with an important role of the chain transport. The Port of Barcelona is the main Spanish 4th generation port. In Europe, the most important are the Ports of Rotterdam, Antwerp, Hamburg and Marseille.

Multiple activities are developed in ports environment and it is quite complex to integrate documentary activities, to control what is being transported, with the economic activities. In addition, these activities involve a large number of operators: land transport operators, port authorities, shippers, stevedores, customs, consignees of goods, shipping agents, customs agents, etc.

Port operators use documentation that must be available in real time in different places at once. The incorporation of new digital technologies in 4th generation ports substantially improves the management of this information and the supply of services, generating at the same time value for customers and other operators. The technology that allows this exchange of information is called EDI (electronic data interchange for administration and transport). It uses a standard language running over the Internet, facilitating dialogue between companies.

Thus, **the 4th generation ports' technological systems affect their organization due to the automatization of the information processing in port companies at all levels:** marketing, computer services, business services, accounting, research and development, etc. They also facilitate the handling of goods and passengers, making more efficient their loading and unloading, and their distribution.

Therefore, network ports offer new opportunities for companies to communicate with their partners, and the use of EDI over the Internet may facilitate the participation of SMEs in port activities.

**Ports that have benefited from technological change are those of Barcelona, Valencia, Bilbao, Las Palmas and Santa Cruz de Tenerife<sup>2</sup>,** who are the first in the implementation of technology. These benefits are traduced into increased port activities (fishing, freight or passenger, nautical sport, etc.) and employment, both publicly and privately (nautical colleges, cruises, distributors, etc.)

Moreover, the development of the Mediterranean corridor may provide an opportunity to continue the process of modernizing the Mediterranean coastline and converting its ports into real logistics platforms, efficient and business and employment generating.

<sup>2</sup> Impact of New Technologies in port management. An empirical approach. Pablo Coto Millán, Miguel Ángel González Fisheries, John M. Castanedo Galan, Ramon Nunez Sanchez. University of Cantabria. 2010.

**According to Idescat (Catalonia Statistical Institute), during the month of June 2012 the Port of Barcelona manipulated 3,864.5 thousand tons of goods, and the Port of Tarragona 2,108. This represents 15% of the tons handled in Spain overall.**

**The Port of Barcelona has an economic impact for the city of about 300 million Euros per year.**

## Impact on professional profiles

**Professionals working in 4th generation ports must have extensive knowledge of foreign languages, especially English, and of port operations. They should also have capacity planning, organization, anticipation and negotiation skills.**

**The Port of Barcelona is the leader of the Spanish ports, ahead of the Port of Valencia, with more than 19,000 jobs and a Gross Added Value (economic value contributed by the activities carried out in the Port) of 1,700 million Euros.**

Activities in the field of sea transport associated with 4th generation ports go beyond the constructive aspects of port infrastructure, which is more linked to the construction industry.

The design and implementation of the technology that enables 4th generation ports requires professionals trained in computing and telecommunications, capable of designing global systems that integrate the needs of all the activities carried out in the port. **Thus, the professional profiles most affected by the adaptation of the 3rd generation ports to the 4th generation are those who are most qualified.** These are responsible of fitting the technology systems to the port's short and long run needs. For example, the **marketing manager, the head of commercial strategy, and the logistics manager.**

In addition, these professionals must know how to exploit the advantages of working in 4th generation ports, which are internationally connected to the rest. These advantages are related to the ability to move goods anywhere in the world, to obtain and manage information in real time or offering alternatives for transport, storage or distribution of goods. The services offered in 4th generation ports have been extended, and facilitate the marketing and distribution of goods in any geographic area in the world. Therefore professionals working in them must have extensive knowledge of foreign languages, particularly English, planning and organizational abilities, and anticipation and negotiation capacity.

**Middle managers of ships loading and unloading of passengers or freight and stevedoring companies** must understand the new communication standards, and in addition to their basic training, they also need to know the management protocols of the sector's online documentation, such as sending cargo manifests and unload from any port, and CUSCAR and CUSREP messages for customs, notifications of dangerous goods, etc. This applies, for example, to professional profiles of ships dispatcher or services port technician.

Furthermore, the increase in port activities, stemming from a better organization and efficiency in the provision of services for the implementation of network technologies, has enabled the entrance of a major number of stevedoring vessels and cruise ships, especially in Barcelona and the Catalan coast, resulting in job creation. While it is true that professional profiles working on cruise ships are associated with tourism and hospitality, maritime traffic control is part of the functions carried out in the port. Therefore, **pilots and maritime traffic controllers should adapt their daily work to this increased traffic.**

Thus, the consolidation of 4th generation ports impacts significantly on some professional profiles, especially in the field of port services, and in particular on the inspector of maritime safety and quality, the pattern of internal traffic, the internal traffic agent, and the boats dispatcher.

**More information about the industry is available on the Barcelona Treball website**  
[Market > Industries > Transportation Sea Transport](#)

This section of the website contains a report on the industry covering employment aspects, where you can see job files for various job profiles and find out the main resources you need to find work in the industry.

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