

Tunisian seaport and globalization: the challenges of the first generation ports

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Abstract—*The gradual evolutions lead to a new environment for seaports. The context becomes more complex and difficult to predict the future and respond to new situations for the first generation ports. In addition, the international trade growth, the development directed to overseas countries and the containerization increased. All these developments have a massive effect on the Tunisian seaports, which damaged through the violence of globalization and the challenges of the maritime ports to remain it's as the first generation ports. This paper studies globalization in the worldwide context and examined the characteristics and the challenges of Tunisian seaports. The main results of this study are the effect of the globalization in the world and the different challenges that leaved the Tunisian seaports in the first generation.*

Keywords— *Tunisian ports, globalization, first generation ports challenges.*

I. INTRODUCTION

Following the vague change, the emergence of new container ports is huge, especially in Latin America and Asia. These changes will influence the maritime transportation of different countries. The differential operators of the ports have a certain solid economic, technological and financial structure in order to be able to counteract competition. Seaports are a point of interconnection between maritime transport and other economic sectors. Therefore, it's have considerable influence on the regions where the economy, which largely depends on maritime industries, receives a particular impulse from the efficiency of the seaport.

The massive progression from one generation to another becomes a challenge for some seaports. Global developments challenge for the countries with first generation ports. Thus, others ports have reached high technology and serve its customer there are ports that becomes a challenge for these countries.

Containerization reduces the duration of loading and unloading operations and allows for faster ships rotation. It soon became apparent to most ship-owners that the container traffic part would only fill one or two ships of sufficient frequency. The problem arose from each one of them. It was, in fact, a considerable challenge. Globalization motivates countries to improve their seaport and their maritime transport system. There are various studies looked into either the globalization and countries developments or

seaports advancement and changes in the globalized context.

In the literature various authors studies the global integration of different countries has a growing dependence on maritime transportation [1]. Seaports are an important part of the maritime transport industry and have a key role within integrated transport chains[2,3].Seaports have served as international trade gateways and crucial economic lifeline of nations by transporting goods and services to people around the world for hundreds of years [4,5].The globalization and the quick growth of world trade, ports are an important link in modern supply chains and logistics processes, served as transport hubs with their intermodal transport networks[6, 7, 8, 1]. Bernhofen [9] studied the great influence of the containerization on the international trade and the transport land. In addition, same authors treated the globalization as a source of development which helped the transport system to be more improved with high technology as Jennings [10].

Furthermore, globalization has created several challenges in case study ports. Growth in global trade has necessitated port expansion, created major local environmental implications [11]. For Jennings [10] the lack of the globalization denoted in the massive changes of the transport system and it technology in a quick time which represents difficulties for the small ports. For Razak [12] the globalization influenced on the government management and resources and makes it disable to drive an adeptness seaport. The globalization created the privatization of the seaport because the government became disabling to manage it in the quick progress of the maritime transport otherwise the privatization can improve the port to be more flexible in the global changes [13, 2, 14].

In addition, in the globalized economy, ports are the key interfaces in the global logistics chains [15]. It is, therefore, imperative to develop greater monitor and coordinator between port customs officials and international organizations [16].

The global maritime network behind the world economy is currently in front of critical challenges. These included stagnant economic and trade activity, as well as global warms and other environmental concerns [17].

Tunisian is characterized by an open economy of its production and exchange structure, which make foreign trade as a vital key of its development

problems and implies a particular interest to the transport sector, in particular the maritime sector. This sector has evolved today in an environment characterized by the liberalization of international trade, the globalization of services and the globalization of production and markets.

The literature review noted that there are many papers in this field of research because the majority of the studies treated the benefits of the globalization as speaking about the increase of trade, the economic growth, the development and diffusion of technology, etc. however, neglect to speak about the effect that the globalization can influenced in the first generation seaports. This paper will study the development of the containerization and their effect in the global world. In addition a whole part of this paper will treat the case of Tunisian seaports in front of this development (globalization) for the reason that Tunisia must update their seaports to be competitive in the global world.

The objective of this study presents a descriptive analysis of the different evolved discovered by the world and caused by globalization in the maritime sector. In addition, it describes the characteristics and the challenges of Tunisian seaports refined to know the status of these ports. This paper is structured as follows. After the introduction, section 2 deals to the globalization in worldwide context, then section 3 describes the characteristics of Tunisian ports, furthermore section 4 reported the different challenges of Tunisian ports and section 5 collected the diverse results and records as a conclusion.

II. GLOBALIZATION IN THE WORLDWIDE CONTEXT

Today seaports in terms of the level of modernity and openness to innovation are divided into four generations. This division is not due to the size of the port, its location or its management, but of the features that characterize his activities. The global transport system adopted a different generation's port. Continue to operate ports in a generation, being an important element in local delivery systems. But the most important role in the supply chain network full the third and fourth generation ports. Ports are, therefore, important for the functioning of the world economy and effective competition in ports and port services plays an important role in the final prices of many products.

Historically, European ports have been the first to develop. More recently, Chinese ports have grown because of the growth and development that has taken place in China since the fall of communism. Similarly, ports have increased what can be explained by the increase in container shipments to China, the dynamism of the Singapore port which influences the region as a whole, and the minimization of port costs.

Lee and Lam [18] assumed that the major Asian container ports are Busan, Hong Kong, Shanghai and Singapore ports. These ports are referred to the customer-centric community ports and named the

Fifth Generation Ports. Consequently, authors adapted a new concept for the evaluation competitive port in the world. In addition, Wong et al.,[19] confirmed that Hong Kong be more attractive with the new generation which based essentially on the supply chain integration.

It is the technical innovations on ships that have played fifty years, innovations marked by naval gigantism, ship specialization, invention the container and the container ships. They become a set of specialized terminals, equipped accordingly, dealing only with categories of ships, in bulk or general cargo.

At the same time, shipping companies have had to find new forms of organization, association, in order to cope with the enormous investments made by the new generations. The great alliances have appeared in the global strategy. The port organizations have been led to evolve and the ports known as fourth generation, port networks distributed in all continents managed by the same group and offering very competitive services.

The naval gigantism, from the 1960s marks an evolution more than an innovation, although the phenomenon, illustrated by the ULCC (Ultra Large Crude Carriers) had considerable consequences for the development of the inshore-port areas. Actually the containerization is the greatest technological revolution of the second half of the Twentieth century.

A. Adaptation of terminals to gigantism and containerization

The search for the optimal size associated with the race to naval gigantism obvious consequences on port facilities, terminals must adapt to accommodate vessels, and also handling. By the late 1960s, the ZIPs (industrial-port) meet the needs of large bulk carrier vessels; with containerization, it took designing suitable dock facilities and registering the port terminal in a multimodal. Successive generations of container ships require adaptations of the whole port, starting with port access to allow the arrival of larger and larger vessels and greater draft.

Table 1. Generations of container ships

Year	Capacity (TEU)	Length (m)	Width (m)	Draft (m)
1972	1500	225	24	9
1980	3000	275	27.5	10
1987	4500	295	32.2	11.5
1997	6600	320	40	14.5
1999	8000	347	42.8	15
2005	10000	378	51	15
Malaccamax	18000	411	60	20

Source: various

Major handling operators put in place technical solutions to the efficiency of terminals to handle increasingly large container ships. For example, the advent of mega-container ships with 10,000 boxes or more [20, 21]. This always made by the edge of the ship docked along the quay. The idea would be to build a simultaneous handling by port and starboard.

The use of floating terminals would also a solution in order to address the problem of the increasing size of ships. The way to design handling with this kind of terminals affects the concept of port space.

The container ship development emerged with large sizes which increase the competition in the international shipping industry, still today the container ship goes through fifth generation. In this context, some authors [22, 23, 24] studied the evolution of the seaport generation. The seaport achieved the fifth generation port, which demonstrates the equal changes of the seaport with the ship container development.

In fact, the whole logistics chain will have to adapt, not only to the port terminals, but also terrestrial transport systems connected to ports and which will manage an enormous quantity of containers [25].

B. The Globalization of Container Operators

The world is organized into a Triad that drives globalization. The containerization constitutes the backbone insofar as it allows technically the routing of increasingly large quantities of goods between the three major poles of this Triad, secondarily between these poles and their peripheries. The theoretical possibilities offered by containerization are scope of application with the growth of international trade and the international division of labor that the development of East Asia. This international transport of goods by which adapts accompanies and participates in the process of globalization. It is this organization that must now be attempted to understand.

The first observation is that of the emergence from the 1980s container operators who implement strategies to develop an activity on a global scale. The economic globalization responds to the container operators globalization. Shipowners, Freight Forwarders and handlers attempt, at least for the biggest of them, to global demand for transport and/or logistics by shippers [26]. They try to take advantage of the containerization to make their business more profitable and compete such as massive flows on land and development of transport intermodal and logistics.

C. Port Governance and State Influence

Port policy is generally conducted by the state. However, the maritime transport sector marked a gradual withdrawal of the state for the ports operation. Indeed, the trend is towards the liberalization of port activities and its privatization. According to the World Bank, there are four types of governance that are summarized in Table 2.

Table 2. The different types of governance for ports.

Responsibilities	Port service	port tool	Proprietor port	Private port
Infrastructures	Public	public	Public	Private
Handling materials	Public	Public	Private-public	Private
Workforce	Public	Private	Private-public	Private
Others functions	Majority Public	Mixed	Mixed	Majority private

Source: World Bank (2001)

In Europe, the phenomenon began almost thirty years ago, mainly in the United Kingdom, where privatization is complete. In other European countries, the movement has moved towards partial liberalization, both in terms of handling and administration. To adapt to Asian regional competition, the Busan port authorities are privatized and become independent of local and national authorities (OECD, 2001).

States have a direct impact on handling through labor. Dockers are subject to the labor laws of the countries concerned. This is partly why French ports face difficulties in the creation of international hubs, since dockworkers are subject to a regime specific to this profession.

The impact of the environment and sustainable development on port growth and strategies is unequally perceived worldwide. It is the main challenge for port activities and changes their environments in the future.

The real impact is on expansion projects as land use planning is increasingly subject to environmental constraints. The future impacts of a sustainable development policy. In particular, the terrestrial services can be taxed to encourage ports to develop strategies for the development of transport intermodal.

III. THE CHARACTERISTICS OF TUNISIAN SEAPORT

The maritime transport is an essential service for Tunisian maritime trade and it is a vital factor of its development, since it ensures almost 95% of Tunisian maritime trade.

A. The specific role of the main Tunisia ports

The Tunisian ports are managed by the Office of the Merchant Navy and Ports "OMMP", which is a public institution. Therefore, each port is at least specialized in an activity. Table 3 describes the infrastructures characteristics of Tunisian port as founded in the report OMMP [27]. These characteristics prove to be available for the first generation seaports. In addition, their comparison with the information in Table 1 show that the Tunisian ports are not developed over time and its can describe as a ports of the first generation. Thus, the delay development of seaports has implications for the growth of all sectors in the country.

Table 3. Characteristics of Tunisian seaport.

Port	Quay length	number of berths	maximum alongside depth	total terminal area
Goulette	1 390	10	9	22
Rades	2 020	11	11	19
Bizerte	1 090	7	11	13
Sousse	980	10	11	15
Sfax	2 590	13	11	24
Gabès	1 830	10	12	15
Zarzis	950	5	12	28

The lack of infrastructure hampers business development. The biggest gap in infrastructure concerns the transport sector, mainly roads and railways, whose standards are lower than those of middle-income countries.

The development problems of the maritime and port sector, for example, are reflected in the fact that the majority of the seven commercial Tunisian seaports are former ports and are close to the cities. The possibilities for extension are therefore limited to less than 10 meters a depth of water for the ships, container vessels and Ro-Ro vessels, and 11.5 meters for bulk carriers.

B. Typology of the ports in Tunisia

The ports of Tunisia and their dependencies are part of the artificial maritime public domain as Table 4 describe. They are retained by the law of 24 July 1995 corresponding to the maritime public domain.

Table 4: Tunisian port service character

Infrastructure	Superstructures	Exploitation	Other services
public	Public	98% public	public-private
artificial State domain	full land, networks, silos, pipelines, cranes, gantries	handling stevedoring, boatage, towing, pilotage	transit, consignment, refueling expertise

In Tunisia the infrastructure and the port superstructures are public also 98% of the operating services are public, others services as transit, consignment refueling expertise are private-public. Which prove that the missing of the privatization practice in Tunisian seaport.

IV. THE TUNISIAN SEAPORTS CHALLENGES

There are several weaknesses in the Tunisian maritime transport.

A. Development of maritime traffic in the world

The evolution of world trade in recent years has led to an increase in maritime traffic, especially container traffic. The increase in container traffic is due to the development of trade in goods with high added value. The development of world trade has also influenced

the natural development of Tunisian ports at different times.

1) Increasing the size of vessels

Since the 1990s, the size of ships has been steadily increasing. This trend can be explained by the fuel savings achieved by the ship-owners, which reduce the cost per container. This has resulted in the introduction of super container ships, resulting in many changes in the shipping industry. Indeed, with the launch of vessels of more than 11 000 TEUs, ports must invest, adapt and even reformulate their strategy.

Moreover, the dimensions of these ships mean that not all ports can receive these giants. This is pushing ports to invest in new docks and dredging their funds. The containers carried by these vessels must be handled as quickly as possible. The ports launched new projects to equip themselves with the largest handling equipment. For advanced ports, projects are focused on automation of handling so that portals are efficient.

The reception of super container ships means for a port the development of larger logistics zones that can accommodate the thousands of containers arrived or in transit. Tunisian ports must increasingly reflect in terms of inter-modality. A single service mode causes the latter to be overloaded.

2) The importance of hinterland

The hinterland plays a key role in the creation and development of maritime hubs. Historically, ports serving important hinterlands have the advantage in the phenomenon of hubs since they were equipped with handling means. The large ports do not need to invest heavily to adapt to new market standards. Hinterland generates traffic to the port and ships can exchange containers unloaded for feeder lines by containers from the hinterland. It requires an investment in service and inter-modality to avoid the accumulations of a single mode of transport.

3) The development of information systems

Shipping is using increasingly sophisticated information systems to manage ports, as well as the millions of containers passing through the ports. Information systems are needed to manage the increasingly complex logistics associated with these movements. Today, the data is processed in real time, which allows for ease of speed and reactivity of the ports in the processing of information.

B. Emergence of global terminal operators

Like the alliances, mergers and acquisitions that took place among ship-owners, the port handling sector concentrated around a many international companies that control almost half the market. These large global operators have two different origins. The first is the large ship-owners who invest and integrate vertically. The second is the local public operator,

which extends regionally, nationally and internationally.

It is an economical choice for large ship-owners who have sufficient volumes to take advantage of this benefit. This trend reflects the desire of the great owners more control the supply chain by integrating upstream and downstream operations, carry a greater value than just transportation.

Global operators benefit from significant economies of scale. In addition, the strategy they put in place allows them to install dissuasive barriers to entry of the port handling market by preventing new entrants.

C. Lack of logistical zones

The seaport evolution impacted the type authorities and their characteristics. Therefore, it accommodated to serve different type of exploitation and handling.

Whereas, the seaports characterized by the intervention of the government in their management structure and their development. This is included in the instructions that a transport industry is public sector. Therefore, the national transport policy neglects investment in the maritime sector. In addition, the absence of the growth policy and the privatization of port authority experiment a low structure in the ports organization and adaptation with the international seaports.

V. CONCLUSION

Maritime transport plays a fundamental role in globalization or without maritime transport and without containerization there is no globalization. Obviously, all other factors as the free trade and the internationalization of value chains are added to accomplish it. The contributions of this paper are focused on the globalization in the worldwide context and Tunisian seaports challenges. The past studies showed that the privatization of port activities changed the situation for some countries. Indeed, many ports are managed by public port authorities that give way to private actors through long-term concessions. Ports can be classified into three types of handling based on global container terminal operators, public sector operators and other private operators.

Therefore, the introduction of super container ships privileged the concentration of the handlers to invest in gantries allowing the handling of these giant ships. Furthermore, large ship owners with dedicated terminals have large platforms. This allowed the ship-owners to secure the handling, mainly for transshipment between lines. It allowed also for a wider range of destinations. This organization ensures greater reliability, respect of schedules and good productivity.

This paper examined the challenges of Tunisia seaports and the difficulties in maritime transport sector, which cannot take advantage of globalization. In Tunisia there is some reform in transport sectors, as the project of the Enfidha port is still in the realization

on early step. Which display the neglect of investment in seaports sector, will all the challenges help seaports to consider as a first generation ports while the world talk today about the fifth generation ports.

ACKNOWLEDGMENT

The authors are grateful to the editor and the anonymous reviewers for their valuable suggestions and comments.

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