Containerisation in croatian ports: necessities and possibilities of development

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Attualmente, lo sviluppo della containerizzazione nel mondo è dominato dai traffici e dagli operatori del Sud-Est asiatico e dell'Estremo Oriente, aree nelle quali viene realizzato un terzo del traffico portuale containerizzato del mondo. Rispetto ai maggiori porti container del mondo, che sono localizzati nell'area del Sud-Est asiatico, il traffico sviluppato dai più grandi porti europei, e specialmente da quelli mediterranei, è di gran lunga inferiore. Sebbene i porti croati, allo stesso modo di tutti i porti adriatici, si configurino quali tipici porti mediterranei, i fattori che influenzano il loro sviluppo li costringono comunque ad un ruolo di secondaria importanza. Questo fatto non ha necessariamente una connotazione negativa, qualora il governo croato, stimolando lo sviluppo del sistema economico interno e dei flussi di traffico, riuscisse a risolvere il problema principale dei porti di Fiume e di tutti gli altri porti croati, cioè la mancanza di carichi.

1 Introduction

Containerization in Croatian ports dates back to the end of the sixties, when the first shipments of containerized shipments appeared in Rijeka, the greatest and most important Croatian port. Their increased presence in the region had first led to the establishment of the temporary container terminal, and later on also to the construction of the specialized port zone in Rijeka for the transhipment of containers on the model of those in the greatest world ports. The container traffic in the other Croatian ports (Split and Ploče) appeared at a much later date, and during the entire period up to the beginning of the war had not been marked by any values of major significance.

The growth and development of containerization in Croatian ports was accompanied by the national and other container operators, whose commercial interest was linked up with the carriage of containers up to and from these ports, as well as by freight forwarders, agents, shippers and other participants in container carriage domiciled in countries of the catchment area.

Due to the updating of technical solutions and the introduction of new equipment calling for different technological processes and organizational approaches in order to reduce the total transportation costs, tradition and favourable geographical position are no longer sufficient guarantee for the development of a port.

As compared with a great number of Mediterranean ports, and especially with the north-European ports, the Croatian ports have inferior technical equipment, the organization of their technological process and work organization in general are on a lower level, their process of privatization has not been completed yet, their traffic connections with the hinterland are poorer, and their forelands have a more modest outlook.

The most propulsive segment of containerization in the world is personified in the "round the world" liner service, mobilizing the greatest container operators and their associations. It has embraced those of the greatest container terminals only which can offer the best port cargo-handling service, with the entire exclusion of the Adriatic sea.

This fact places all the Adriatic container ports, and hence also the Croatian ports, into the group of ports of secondary importance from the aspect of container traffic and calls for the redefinition of their position and role in the system of the world container ports.

2 The actual moment and development trends of the world container ports, especially in the territory of Europe

The actual moment of containerization development is dominated by the traffic and economic subjects from the areas of southeastern Asia and the Far East. The lower costs of manpower than those in Europe and America, up-to-date engineering and technology with the use of robotization and computerization, but also the legal systems aiding the investment of capital into a number of production spheres and its speedy growth can be considered factors of decisive influence for the creation of industrial giants from such contries as Taiwan, Hong Kong,

Singapore and South Korea.
In order to maintain highly developed industrial production a constant inflow of raw materials and semi-manufactures is indispensable, accompanied with the quick shipment of the finished articles to the markets in Europe, America and Japan where there is demand for them.
In consequence of the geographical position of the said countries this is possible only by means of the seaborne traffic, and as the greater part of the material to be transported consists of consumer goods which are very suitable for containerization, the technology of conveying the distance between the areas of production and consumption.
Ever since the middle of the eighties the countries of southeastern Asia have been taking the lead in all the segments of containerization, as for instance:
- the Taiwan operator Evergreen Line introducing the exploitation of IV generation container ships on the "round the world" lines, thus becoming the greatest world container operator,
- the Asian ports of Hong Kong and Singapore occupy the front positions in the world statistics of port container traffic (in 1995 their share in the total world port container traffic exceeded 10%),
- South Korea is the world's greatest container maker,
- in this region also a good part of cargo-handling and carrying equipment, ships and other means of transport for the needs of containerization are made,
- a great number of technical, technological and organizational solutions of decisive influence for the further development of containerization have been tested and applied by the traffic operators domiciled in this part of the world.
The relation to north-Europeand and Mediterranean ports, subject to constant transformation, is always of interest when defining the importance of the Croatian ports within the world system of containerization.
One third of the total world port container traffic is implemented in the territory of southeastern Asia. In 1995 the annual percentage growth amounted to 14,3%, the result of the constantly increasing exports to other parts of the world, but also of the increasing transhipment of containerized cargoes from the great oceangoing container ships to the much smaller feeder ships - container cargo carriers within the same region[1].
The participation of the European ports in the total world container traffic is 21,3%[2]. In 1987 Rotterdam's position as the world's greatest container ports comes to the end. For this port this is the beginning of the period of search for the modalities of a speedier growth.
Anticipating that the "round the world" services with big container ships will present the dominant moving force of the containerization development, the port administration together with the ECT, the greatest terminal operator in the port, are starting a project for the construction of a new Delta terminal.
Located at the river Rhine estuary so as to permit the depth of the aquatorium to accommodate the biggest container vessels, this terminal, due to the automated work of its stacking facilities through the application of new cargo-handling means as well as the use of sophisticated dockside cranes, has become a model of how to make plans for and how to /equip a terminal/ which would be in a position to offer to the biggest container ships high-quality services, and at the same time due to its greater cargo-handling efficiency and lower unit costs, increase the business efficiency of that part of the port.
Although according to the world's statistics Rotterdam occupies the fourth place, its yearly container traffic is more than twice lower than the traffic of Hong Kong, which is the largest port, while the traffic of Hamburg is four times lower.
In 1995 the European container ports in the Mediterranean realized a turnover of 7.600.000 TEU, which is an increase of 18,9% as compared with the previous year[3]. This sharp traffic increase is due less to the increase in the exchange of goods in which the economic agents from the catchment area of the port participate, and more to the results of the container cargo transhipment

Port	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1. Hong Kong	2.774	3.457	4.033	4.464	5.100	6.162	7.972	9.204	11.266	12.563
2. Singapore	2.203	2.635	3.375	4.364	5.224	6.354	7.560	9.046	10.600	11.850
3. Kaohsiung	2.482	2.779	3.083	3.383	3.495	3.913	3.961	4.636	5.202	5.053
4. Rotterdam	2.870	2.839	3.289	3.617	3.666	3.766	4.123	4.161	4.475	4.789
5. Busan	1.533	1.949	2.206	2.159	3.348	2.694	2.751	3.071	3.700	4.500
6. Hamburg	1.246	1.451	1.622	1.728	1.969	2.189	2.268	2.486	2.700	2.900

Source: 1. Containerisation International, The National Magazine Company LTD, London, 1987-1995
2. Cargo Systems Supplement, London, 3/1996.
Note: Data for the port traffic in 1995 according to the Source under 2.

Table 1: container traffic in the greatest world ports in the 1986-1995 period

from big container ships to the feeder ships.
The continual interest in the relations between the ports of northern Europe and those of the Mediterranean is due to the fact that their catchment areas partly overlap. If at some time elements existed, such as the intensity and regularity of the flow of goods, frequency of ship arrivals, development of the port foreland, presence of bigger and more important container ships in the port, total of yearly port traffic and the like, which could lead to the conclusion that the Mediterranean ports are of secondary importance in the container traffic as compared with the ports in the north of Europe, today these reasons no longer exist.
The relations between the Mediterranean ports have also undergone essential changes, evidenced by the tact that some ten years ago the greatest container traffic was realized by Marseilles and Livorno, which in comparison with the greatest Mediterranean container ports Algeciras and La Spezia are ports of minor importance.
Stagnation of the ports mentioned is the result of the difficulties in establishing the optimum structure of the working collective and the port management, which was accompanied by frequent strikes[4].
A number of Mediterranean ports had at the same time carried out privatization of the facilities, thereby considerably improving the organization of work and productivity, which was reflected also in the increase if the traffic. A significant example are the ports of Algeciras/La Linea and La Spezia, in 1995 realizing the greatest container turnover in the Mediterranean basin, and some ten years before that they could have been ranged among the group of minor container ports in the Mediterranean.
The recent trend with the major container operators is to control the entire transportation process by establishing enterprises with a predominently proprietary share, individually managing the port terminal, continental terminal, and overland carriage.
Those Mediterranean countries in which the time of the end of the privatization process has overlapped with the interest of some of the major container operators for the control over the entire transportation process, and in this connection with the management of the port terminal, are being transformed into collecting and distribution centres of the respective operator for the entire Mediterranean basin, or covering an even wider area.
When selecting the port, it is of equal importance for the operator to consider the distance of the port from the established "round the world" service route, and the possibility of independent management of the container terminal in a way making it possible for him to realize the best financial result.
In determining the meaning and in drawing parallels between the ports of northern Europe and those of the Mediterranean it is necessary to consider some additional criteria such as: the overland connection with the hinterland, productivity, and the oversea distance from the economically most important regions of the world.
The overland connection of the Mediterranean ports with the catchment area is not equal to that of the ports of northern Europe, both with regard to the density of the road network and the kind and up-to-dateness of the transport routes. In spite of the intensive construction of the traffic infrastructure facilities in the hinterland, the Mediterranean ports, as a rule, have not arrived at an arrangement with the railways administration resulting in the formation and offer of preferencial tariffs on the basis of which even the less attractive routes could improve their competitiveness.
The productivity of the Mediterranean ports is still inadequate and their transhipment costs excessive, although this deficiency could be alleviated if the process of privatization were carried out consistantly and the technical equipment and organization of work continued to improve.

Port	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1. Algeciras	384	430	412	397	553	762	780	807	1.004	1.155
2. La Spezia	168	199	282	413	454	464	612	780	850	1.060
3. Barcelona	341	385	410	440	448	489	525	501	540	685
4. Valencia	268	321	343	390	387	357	371	385	458	640
5. Genova	316	265	327	238	310	344	330	343	500	610
6. Pireaus	232	265	266	389	426	463	511	537	565	590

Source: 1. Containerisation International, The National Magazine Company LTD, London, 1987-1995
2. Cargo Systems Supplement, London, 3/1996.
Note: Data for the port traffic in 1995 according to the Source under 2.

Table 2: container traffic of the greatest Mediterranean ports in the 1986-95 period

In the light of the world trade estimate foreseeing the growth of exchange between that Far East and Europe, this could mean a gain in importance of the Mediterranean ports, as transportation to the eastern Mediterranean is by about 2000 miles shorter as compared with transportation to the ports in the North of Europe. This is a saving of 3-4 days in the total time of duration of the voyage, or a saving of about 150.000 US $ in the costs of the voyage, depending on the size of the ship [5].

The expected increase in foreign trade exchange between the Far East and North America will give an additional impetus to the growth of container traffic in the Mediterranean basin, especially in such ports as Algeciras, Malta and Gioia Tauro, which are entirely devoted to the transhipment of containers from the big container ships to the feeder ships.

This will probably lead to further considerable increase in their container traffic, while the Mediterranean ports such as Valencia, Barcelona and La Spezia, which in the traffic structure have a considerable share of the flow of goods from the catchment area, i.e. from Southern and Central Europe, will in the coming years see a decline in their growth of traffic.

3 Croatian container ports within the system of mediterranean ports

As compared with the traffic of Mediterranean ports the ports on the Adriatic, including also those on the Croatian coast, have a symbolic container traffic (500.000 - 600.000 TEU yearly), which is on the traffic level of a medium-sized Mediterranean port. Of the total traffic of Adriatic ports the Croatian ports account for about 50.000 TEU per annum.

Before the begining of the war container traffic in Croatia was noted in three ports: Rijeka, Ploče and Split, of which Rijeka alone had a specialized container terminal whose infrastructure and equipment after the completion of stage 2 of construction had a performance efficiency of 100.000 TEU per annum and ability to give service medium-sized ships.

The result of this is a noticable traffic exactly in the port of Rijeka, while traffic in the port of Ploče is only symolic. During the war period from 1990 to 1994 the container traffic situation in these ports was subject to essential changes. After the sudden fall the traffic of the Rijeka port almost reached its prewar figures. Although precise data are not available, according to some indications, the container traffic of the port of Split is considerable and in that period it almost attains to the traffic of the port of Rijeka. As this is the traffic achieved through RO-RO manipulations, exclusively for the requirements of the UN powers in neighbouring Bosnia and Herzegovina, it is not possible at this moment to use this fact to predict the future development of container traffic of the port of Split for commercial purposes.

Besides of being in a very favourable geographic position with regard to traffic, Rijeka, as the only Croatian port fit for efficient transhipment of containers, has, like the other ports in the Adriatic, the specific qualities of Mediterranean ports.

This in the first place refers to the relatively up-to-date facilities for the accommodation of containerized cargoes, inadequate overland connections, uncompleted process of privatization, reduced productivity and higher transhipment costs as a result of inferior organization of work.

In the negative sense this characteristic comes to the fore in the port of Rijeka to a larger extent than in other Adriatic ports, especially in Trieste and Koper, all of them belonging to the traffic route of the North Adriatic. In distinction from the port of Rijeka their connection with the catchment area, which they share, is better and is under intensive improvement work, while the process of privatization has almost been completed.

The fact that determins al Adriatic ports, and hence also the Croatian ports, for the future, as ports of secondary importance in container traffic, is their distance from the permanently established routes of big container ships through the Mediterranean.

The possibility of the mentioned ports, which includes Rijeka, competing with the Tyrrhenian ports in accommodating big container ships on their way from the Far East via the Suez Canal to North America is more of a theoritical than of a practical character. After in the south of Italy the new container terminal Gioia Tauro was built, for the greater part intended for the transhipment of containers

Port	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1. Rijeka	32.226	43.774	48.493	52.451	47.857	37.973	44.563	49.913	45.023	26.000
2. Ploče	1.870	1.776	1.366	157	–	–	–	–	–	–
3. Split	107	–	–	–	?	?	?	?	?	?

Source: Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija 1987-1989, Grupacija morskih luka, 1988-1990.

Table 3: container traffic of croatian ports in the 1986-1995 period

from big ships to feeder ships, the possibility of diverting the flow of goods of this kind to the Adriatic had become negligible.
The development plans of the Adriatic, and of course also of the Croatian ports, should not only take into consideration this fact, but in this connection also redefine and plan the development of these ports on other principles.

4 Factors and prospectives of the development of croatian container ports

The actual condition in the Croatian ports is influenced by a number of factors. The first group consists of those whose functioning is determined by the development of the Mediterranean ports in general, and has been elaborated in detail in the preceding part of this paper, such as:
- poorer technical equipment, lower level of organization of work, higher costs of labour as compared with particular Mediterranean, and especially north-European contries,
- while in the majority of Mediterranean and north-European ports the process of privatization has been completed and thereby the possibility offered to the major container operators to run the container terminals in particular countries on the basis of a long-term concession agreement, the privatization process in the Croatian ports is still in progress,
- characteristics of the transport route to which the Croatian ports belong are less favourable than a great number of other transport routes a more modest network of land routes of inferior technical characteristics, uncoordinated tariff policy of participants in transportation on the transport route in question, modest level of electronic data-procesing on which the information systems are based and more often than not limited to particular participants in the transportation process with insufficient and inefficient information exchange, and the like.
- Croatian ports are too far away from the standard container-ship ports maintaining "round the world" services crossing the Mediterranean to make deviation to the Adriatic economically justifiable.
The second group of factors are those specific for the Croatian ports and possibly also some other ports in the Adriatic, and which have a decisive influence upon both the actual situation and the future development as well. These deserve special mention:
- in countries of the catchment areas of Croatian (and some Adriatic) ports radical political and economic changes have occurred, the result of the initiation of the process of transition or restructuring of the entire process of production accompanying the disappearance of the old and appearance of new enterprises - agents of foreign trade exchange which are not necessarily oriented to Croatian ports;
- the war in Croatia and Bosnia and Herzegovina resulted in the abandonment of Croatian ports, both on the side of shippers and ship operators, and business operations of those agents which continued to use the services of the port of Rijeka, but also of some other Adriatic ports, became burdened with high insurance premiums, which in turn was reflected in the reduction of port traffic;
- the restructuring process of Croatian economy initiated during the war already, and the destruction of part of the production capacities in Croatia and Herzegovina through war operations, resulted in a considerable reduction of the flow of goods via Croatian ports for the needs of the economies of the mentioned countries;
- the initiation of the process of privatization and market orientation in relation to the Croatian liner operators, which up to the beginning of the war had been the agents connecting Croatian ports with the world, brought to light lack of logic in quite a number of their business operations, which resulted in the decline of their transport efficiency with regard to the Croatian ports, and thereby also with the liner service of these ports with the world.
The end of the war in Croatia and in neighbouring Bosnia and Herzegovina will have an effect upon the revival and expansion of economic activities in their domain, which will at the same time lead also to the strengthening of the flow of goods by way of the Croatian ports.
As at the moment Rijeka is the only port having a specialized port and satisfactory conditions for the transportation of containers to and from its port, it can be expected that the greater part of traffic of this kind of cargo, not for Croatia only but also for Bosnia and Herzegovina, will be shipped through this port by land, and this could improve the structure of the port container traffic, which is at present very unfavourable.
It is to be expected that any possible growth of the flow of goods, the dynamics of which it is impossible to predict, will call forth the need for the construction of yet another feeder container terminal on the Croatian coast in the region of Dalmatia for the requirements of that region and its immediate hinterland.
The greatest problem with the Croatian ports, and hence also with the port of Rijeka, is lack of cargo. On that account the first task of the Croatian government is to create conditions for the return of the lost cargo, or the acquisition of new cargoes. With the actual condition of the Croatian ports in view, it will not be easy for the Croatian shipping industry, the entire national traffic system, the economy of Croatia and the countries in its catchment area to attain this aim, but not also impossible to realize.
In this context the Croatian Government and the competent Ministries should:
- insist on the completion of the process of privatization in the ports, which will result in the increased efficiency of business operations,
- insist upon the completion of the process of restructuring the economy, as the starting and development of production will increase the quantities of cargoe to be transported,

- encourage the investment of private capital in economy and traffic by ensuring steady conditions of business operations and a stimulative tax system,
- create conditions for the return of the Croatian merchant navy under the national flag and stimulate its liner service from and to Croatian ports,
- modernize and strengthen the network of land-road connections with the hinterland, especially with the neighbouring countries (Hungary, Austria, Bohemia, Slovakia, and the Ukraine) which are or could be interested in transhipment services specially of the port of Rijeka,
- stimulate through legal regulations, but also through other measures cooperation of all participants on the traffic routes through Croatia, to achieve through a uniform tariff, possibly a lower one in relation to the competing traffic routes, the acquisition of cargo.

Rijeka and other Croatian ports should build their future development on the principle of satisfying the transhipment requirements of Croatia and the countries in the immediate hinterland. Following the examples of container ports of secondary importance, which have remained outside of the main flows of containerized cargo, which is the case with the majority of the world's ports, this status should not inevitably lead to less successful results of business operations.

5 Conclusion

The actual moment of containerization development is dominated by traffic and economic agents from the territory of southeast Asia and the Far East. Not only that it is in this region that the two of the greatest container ports of the world are situated, together yearly transshipping more than 10% of the total container port traffic, but it is also in this part of the world that one third of the world's port container traffic is being realized.

European ports participate in the total world container traffic with 21,3% (1995), while its greatest port Rotterdam realizes "only" a little less than half the traffic of the greatest world port.

Remarkable is the growth of the container traffic in Mediteranean territory at the annual rate of 18,9% (1995), which is less due to the growth of the exchange of goods, but is rather the result of transhipment of containerized cargo from big container ships to feeder ships.

As compared with the traffic of the Mediterranean ports, the Adriatic ports, including also those on the Croatian coast, realize only a symbolic container traffic, on the traffic level of a middle-sized Mediterranean port, while the total traffic of Croatian ports is on the level of 50.000 TEU per year.

Before the beginning of the war of Croatia, container traffic had been recorded in three ports: Rijeka, Ploče and Split, of which Rijeka a lone has a specialized container treminal.

Acording to their characteristics the Croatian ports are typical Mediterranean ports, which is understandable as identical factors influenced their development, which were those that had influenced the development of the Mediterranean ports.

The actual condition and future development in Croatian ports is also under the influence of specific factors depending on occurences in economy and traffic in Croatia as well as in countries of the catchment area.

Today the greatest difficulty affecting the Croatian ports is lack of cargo, so that the top-priority task of the Croatian Government and the competent Ministries is to secure stable business conditions and to stimulate development of the country's economy and traffic system.

In this light the fact that the port of Rijeka is to remain together with other Adriatic ports and a great number of Mediterranean ports for the period to come out of the sphere of the principal world container routes does not necessarily have a negative connotation.

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