Waterfront Architectures.
A comparative analysis between Lisbon and Trieste

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Abstract
The relationship between the city and the water has always been very close, being in some cases the reason for the origin and development of the territory. The proximity to the seaside it took to the development of commercial ports, which allowed the growth of the city they served. In this sense, the ports were, for a long time, the geographical and functional centre of the city, being the quay the centre of the structure of the urban fabrics. Thus, the quay was the main urban public space. The transformation of port activity resulting from industrialisation contributed to landfills and new waterfront architectures. In this sense, our research focuses on the comparative analysis between Praça do Comércio, in Lisboa (Portugal), and Piazza dell'Unità d'Italia, in Trieste (Italy).

Keywords: Waterfronts; Port Cities; Architecture; Public Space

1.0 Introduction
Our research on architectures waterfront points mainly to the changing relationship between the city and the activities related to water, not only from a historical perspective, but also from a perspective of development and future promotion of coastal areas.

The aim of this investigation is to study and understand the problems associated with the development of the port cities and the comparative analysis between riverside public spaces with similar characteristics in their development and requalification processes. Praça do Comércio, in Lisboa, and Piazza dell'Unità d'Italia, in Trieste, were the spaces selected for this research, in which one attempted to perceive the urban evolution of both and their waterfront architectures.

2.0 Waterfront architecture and urban planning

2.1 The city-port relationship
The relationship between the city and the water has always been very close, being in some cases the reason for the origin and development of the town. The proximity to seaside it took to the development of commercial ports, which allowed the growth of the city they served. In this sense, the ports were, for a long time, the geographical and functional centre of the town, being the quay the centre of the structure of the urban tissue. Thus, this wharf was the main urban public space.
The transformation of port activity due to the industrialisation has contributed to major changes in the relationship between city and water, mainly through the construction of landfills, new riverside architectures, as well as accessibility and transportation infrastructures, mainly railways. The development of port logistics, particularly containerization, has introduced new constraints on the appropriation of these areas with a high level of fragmentation. With the deactivation and industrial relocation, associated with the reduction of port and logistic activities and the development of new technologies, important waterfront areas were liberated. Thus, over the last decades, we have witnessed significant changes in the urban paradigm in the waterfronts, considering, on the one hand, the processes of marked industrial obsolescence in these areas and, on the other, the prospects of functional reconversion in areas of great attractiveness and value in the context of requalification operations (Pinder; Knap, 1992). Forms of ownership and control of the waterfront, although the subject of some controversy, are revealed as a relevant issue both in its conceptualization, both in the problems associated with it.

Among the several factors that accompanied the changes in the waterfronts, we highlight the developments of globalization and the demands of tourism growth associated with the requalification of public spaces, including the functional dynamization of the surrounding areas, with a view to the development of new types of urban centrality. With the obsolescence of many maritime and port activities, around Europe, there has been a spreading of proposals for the rehabilitation, conversion or adaptation of old port facilities to new functions, residential, tourist, commercial and various activities of playful nature (Hall, 1998), a growing trend of (re) designing the city from the waterfront appreciation.

The historical evolution of the city - port relationship is summarized in Bird’s model Anyport (Fig. 1), which in 1963 describe how port infrastructures evolve in time and space. Based on his research into the evolution of British ports, Bird proposed a five-stage model to demonstrate how facilities in a typical port develop. Port infrastructures are thus constructed over several decades and in some case over several centuries.

Fig. 1: The Evolution of a Port - The Anyport Model, 1971
Source: transportgeography.org/?page_id=3388

Also Bryan Hoyle (1998), synthesizes the history of the city - port relationship grouping it into six stages of evolution (Fig. 2). The last point (that not appeared at the figure) reflects the globalization transforms the role of the ports, the city-port association is renewed giving the urban reconversion, it is promoted the integration of the port-city. Nowadays, the increased requirement of security in areas exclusively dedicated to port activity leads to their isolation and segregation.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Symbol</th>
<th>Period</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td>(I) Primitive cityport</td>
<td>●</td>
<td>Ancient-medieval to 19th century</td>
<td>Close spatial and functional association between city and port</td>
</tr>
<tr>
<td>(II) Expanding cityport</td>
<td>●-●</td>
<td>19th-early 20th century</td>
<td>Rapid commercial and industrial growth forces port to develop beyond city confines, with linear quays and break-bulk industries</td>
</tr>
<tr>
<td>(III) Modern industrial cityport</td>
<td>●-●</td>
<td>mid-20th century</td>
<td>Industrial growth (especially oil refining) and introduction of containers and re-re facilities require separation and increased space</td>
</tr>
<tr>
<td>(IV) Redevelopment of the waterfront</td>
<td>●</td>
<td>1960-1980s</td>
<td>Changes in maritime technology induce growth of separate maritime industrial development areas</td>
</tr>
<tr>
<td>(V) Redevelopment of the waterfront</td>
<td>●</td>
<td>1970-1990s</td>
<td>Large-scale modern port consumes large areas of land and water space; urban renewal of original core</td>
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Fig. 2: The historical model for port-city development, Hoyle, 1997
Source: Hoyle, 1998
Ashworth (1991) reports that the removal of port activity from the city centre resulted in the obsolescence of areas with great architectural wealth. These areas, of a land-water interface, have become the object of speculation, interest and enormous potential for urban tourism.

In this context, emerged the programs and riverfront redevelopment projects that try to recover the city's relationship with its waterfront which is free of port constraints (CML, 2008). A relationship that had been lost in the 80's of the last century, but which today are the focus of attention as urban centres of relevance, such as squares and pedestrian waterfront walks.

Port development can and should be understood in its context and in all its dimensions, if we consider the ports, since its inception, as an integral part of social and economic evolution, we are faced with a product and producer of the same evolution, with a growing importance and the complexity of relations between societies.

According to the historian Benevolo, the main medieval cities that stood out in navigation were the Italian Genoa, Venice, Pisa and Amalfi. Later, with the maritime expansion also Portugal and Spain gain a major role, especially by the maritime world discoveries (Fig. 3).

Fig. 3: Cities ports around the Mediterranean Sea and Atlantic Coast, highlighting Lisboa and Trieste
Source: Joana Pereira (author) based on Google Maps 2019

2.2 The morphogenesis and ways of approaching the public spaces of Lisbon and Trieste
Our research focuses on the comparative analysis between the public spaces of Baixa Pombalina, downtown of Lisboa (Portugal), and the centre of Trieste (Italy). Thus, two squares were selected that reveal a rigorous enlightenment matrix of its surroundings, with a similar urban and architectural scale: Praça do Comércio, in Lisboa, and Piazza dell'Unità d'Italia, in Trieste (Fig. 4).

Fig. 4 (a): Lisbon
Fig. 4 (b): Trieste

Lisbon (Olissipo) has always had a close relationship with the Tejo river, not only as contemplation, but also as a means of connecting to the world, with port activities and trade. In 1498, the planning period for the city, the architectural complex of Ribeira, the future Terreiro do Paço and, today, Praça do Comércio was the central generating element of the new image of Lisbon. Ribeira stood out for its unmistakable originality in the context of European urbanism of the modern era. By bringing together in a single large urban centre "praça and terreiro" with other equipment (Carta, 2012). Around 1500, king D. Manuel I decided to move the royal residence to the riverside area, ordering the Paço da Ribeira (royal palace), and creating Terreiro do Paço. This was a court place for celebrations, where people came from all over the world, ships loaded with chinese porcelain, indian spices, brazilwood and sugar.
In 1755, a natural catastrophe destroyed Paço da Ribeira and the buildings around it. Quickly, it was necessary the reconstruction of one of the most affected areas of the city, which oversaw the prime minister Marquês de Pombal. After the catastrophe, the works in Terreiro do Paço began immediately, because the port and commercial activity couldn’t stop. The losses suffered a redoubled action to compensate them, and for this it was indispensable to operate the quay and customs (Santos, 2012).

The structure of Baixa Pombalina, designed by Eugénio dos Santos and Carlos Mardel, in 1756, initially considered austere and for centuries object of controversy, acquired a very particular dynamics through a strong presence of public spaces (Afonso, 1999). The Pombaline vision was supported in the process of transformation of property, urban order expressed by the proportions of the design of the blocks and street hierarchy and by the compositional architectural unit (at Casa do Risco), as well as the topographical and maintenance of some notable elements (Fig. 5). The procedures that framed these strategies were the guiding lines of the power of Enlightenment reason. From the bourgeois city, to the developments of industrialization, to the assertion of liberalism, and then to progress due to technological and social revolutions, Pombal’s utopia became a reality (Afonso, 1996).

Public spaces thus reflect the compromises or antagonisms between the initial vision of the project, the different forms of appropriation over time, the capacity to adjust to social and economic changes and the relationship of proximity to the Tejo river (Ferreira, 2017). The urban project included an architectural project, concretizing the transition from "terreiro" to "praça": a uniform architecture, delimiting a regular monumental space by the dimensions and the sobriety of the composition (Santos, 2012). Praça do Comércio (Fig. 6) plays an important role, advancing on the river while projecting with "open arms" to receive it. We can interpret the square simultaneously as an open shot from a densely populated mesh, or conversely as the great entrance of the city. Here there is a relationship of transparency between the network of public spaces, with a high landscape and historical context of the whole of Baixa (França, 1989).

Trieste was born as a modern city in 1719, when the small village that derives from Roman Tergeste was declared a free port by Emperor Charles VI of Austria Hungary. The intention of the Habsburgs and their architects was to make this city the economic and financial capital as well as the main port of the empire. The choice of Trieste was probably dictated by the presence of deep water, difficult to find on the Upper Adriatic, useful for the creation of a large port. Urban interventions were therefore carried out on a large scale: the construction of the new town, the Borgo Teresiano, north of the square, the Borgo Giuseppino to the south.

The city is therefore predominantly bourgeois, linked to port commerce and finance, and one of the most multicultural cities in Italy, with a great literary tradition and a huge square by the sea. In the Middle Ages, it competed with Venice for control of the Adriatic Sea, being almost destroyed in the process. Throughout this troubled historical journey, but especially since its integration in Italy, it has been
losing momentum, falling into an inertia that only began to recover in the 70s, with the creation of a new port infrastructure in Slovenia. Today it is the centre pole in the strategy of the so-called Corridor 5, connecting the countries of Eastern Europe and the West (Rutteri, 2010).

The evolution of the sea front of Trieste, which was being built or reconstructed from west to east, began with the plan of urbanisation launched by the Empress Maria Theresa of Austria, a network of streets orthogonal to each other, developed from a network of parallel channels, intended to convert Trieste into a “Mediterranean Amsterdam”. Created on the salt flats of the city, urbanizing an area outside the walls, Borgho Teresiano promoted the development of port trade. From the network of channels provided by the plan, there is only the Grand Canal, a few blocks west of Piazza dell’ Unità d’Italia. The buildings that make up its configuration were built by the largest merchants in the city, especially Palazzo Carciotti (1802), a classic of the Palladian style. In 1934, it was defined Piazza Sant’Antonio, at the top of the canal, with a garden and a large fountain in the centre. Piazza dell’ Unità d’Italia, named like this after the annexation of Trieste to Italy in 1955 (Semerani, 1969) occupied the centre of this urban plan in spatial terms. Originally, the square was less than half what it seems today, delimited by Palazzo del Comune, closed to the sea by the walls and the Torre del Porto but overlooking the old port known as Mandracchio. (Fig. 7).

The square assumed its present appearance after the renovation from 2001 to 2005, when the asphalt was replaced by blocks of sandstone that resemble the stones that once paved the square. The fountain of the Four Continents was brought back to its original position, aligned with the main entrance of the Comuna di Trieste (City Hall). A lighting system with blue LEDs on the pavement marks the memory of how far the sea has entered the old marina (Szombately, 2008). Piazza dell’Unità d’Italia is a large rectangular drawing square with three facades framed by monumental palaces and a fourth free facade that “embraces” the Adriatic Sea (Fig. 8). Very similar to Praça do Comércio, but in an Austrian imperial version.

3.0 Methodology
The understanding of an idea we call sea architectures is based on the search for the processes of urban tissue formation on the waterfront, with emphasis on the search for similar morpho-typological relationships. In this context, we emphasise the importance of the recognition of relevant case studies with some conceptual proximity, both in terms of the planning processes and architectures that emerge in the relation between urbanistic processes and the waterfront.
The understanding of the relations between the development of own morphologies with some regularity, the conquest of significant architectural unity and the relations between notable public spaces, considering contexts of port activity are the main focus of this research. This complex articulation requires the understanding of city-port relations, as well as their transformations over time. It is in this context that a comparative analysis between the examples of Lisbon and Trieste assume particular relevance for the understanding of the idea that we generate around the architectures of the sea, with particular relevance in the valuation of exceptional heritage within the Enlightenment thought. In these examples, it is important to consider the latest developments of the options of port logistics and the redevelopment of waterfronts, including the various forms of ownership around these public spaces over time.

4.0 Findings
The understanding of the process of expansion of the port cities and their waterfront architectures made possible a reading of the riverside public spaces. In this sense, knowledge about the forms and processes of transformation of both urban tissues where Praça do Comércio, in Lisboa, and Piazza dell’Unità d’Italia, in Trieste, are inserted, as the understanding of the experiences and appropriations of these spaces over time. The understanding of their logics of production and transformation are even more relevant if we consider a comparative analysis on international scale. We find some similarities between territorially distant cases, due to the tendencies and practices of the project, as to the political influences of each period (Fig. 9 and 10).

Fig. 9: Events at Praça do Comércio

Fig. 10: Events at Piazza Unità d’Italia
The developed research made it possible to perceive the processes of transformation of the public spaces of the two cities, highlighting the similarity between the relation of Praça do Comércio and Praça D. Pedro IV with the relation of Piazza dell'Unità d'Italia and Piazza Sant’Antonio. Although its origins of conception are different, the enlightenment thought associated with both urban fabrics is visible. It is also worth noting the relationship of riverside proximity that both present, but in a sense of waterfront architectures of contemplation and ostentation, in which the port activity was redirected to the lateral ones. In Trieste, there is no Cais das Colunas, but the same function of mystic-landscape finish is performed by Molo Audace (Fig. 12). Both for their characteristics thus become the perfect place for the tourist.

Fig. 12 (a): Cais das Colunas
Source: (a) Michelin travel, Cais das Colunas [travelguide.michelin.com/europe/portugal/lisbon/cais-das-colunas]

Fig. 12 (b): Molo Audace
Source: (b) Veit Heinichen, Molo Audace, 2014 [http://veitheinichen.eu/?luogo=molo-audace-trieste]

Thus, the architectural forms that configure both squares have identical characteristics, due to their architecture of heritage and historical value, as well as the associated uses. Praça do Comércio, one of the largest squares in Europe, with about 36 000 m², is composed of a group of buildings where are located different ministries, public institutions and the most famous coffee shop Martinho da Arcada, the oldest in Lisbon, and one of the favourites of the Portuguese Poet Fernando Pessoa (Fig. 13). Piazza dell'Unità d'Italia, with about 12 280 m², is composed of buildings such as the Town Hall, 1875, by the architect Giuseppe Bruni; Palace of Stratti, 1839, by the architect Antonio Buttazzoni, also home to Caffè degli Specchi, a historic cafe in Trieste; the Pitteri palace, 1780 by the architect Ulderico Moro, which is the oldest building in the square (Fig. 14).

Fig. 13: Architectures of the Praça do Comércio
Source: Joana Pereira (author), 2019

Fig. 14: Architectures of the Piazza dell’Unità d’Italia
5.0 Discussion
The research sought to understand and value the planning concepts of both cities, such as its urban design limits, the dimensions and geographic orientation of the public space, its waterfront architectures, as its framing morphogenesis. The observation of these two case studies proved to be relevant to a critical reflection on the importance of symbolic monumentality or as functional changes. These spaces are revealed as privileged also to discuss the direction of the city's architecture, namely the architecture of series verses architecture of exception.

Since the Pombaline reconstruction to the present, the buildings that surround Praça do Comércio suffered some functionality changes, however, stand out the government buildings that have settled there and the commercial spaces that were established under the arcades. These commercial spaces are currently targeted for restaurants and tourist office (Fig. 14).

In Piazza Unità d’Italia, it should be noted that bars and restaurants are also at ground level, where the function of passage also prevails in some cases under the arcades. We also found government buildings, Palazzo del Governo and Regione Autonoma Friuli - Venezia Giulia, near to the sea, and at the opposite side of the square the Comuna di Trieste (Fig. 15).

6.0 Conclusion & Recommendations
In this investigation, we recognise the resilience of these public urban space as notable elements of political, economic and symbolic representation, assuming an importance in the collective memory. The recognition that we make of the cases studies reveals an impressive achievement of the processes of urban and architectural design, of great sensitivity in the relations of drawing the city with the space-limit and space-communicating. The architectures of the waterfront, although distant, are close in conceptual terms. In both, we find an urban scenario, without denying the requirements of a city port, maintaining in this way a dialectic between the commitments of architectural monumentality and the subsequent industrial and port developments in the surroundings.

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