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The Impact of Public Health Crises on Lisbon Public Space Policies: From the 19th Century to the Present Days

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Abstract. Cities have been affected, throughout History, by earthquakes, big fires, epidemics, and pandemics that sparked moments of reflection and change in the city form and public space quantity and quality. For example, this happened after the Great Fire of London (1666) or the Great Earthquake of Lisbon (1755). After episodes of destruction or disruption, debates and projects forge the urban answer to diminish future losses and risks. From this starting point, we discuss the impact of two distinct public health crisis - the epidemics of the 19th century and the current COVID-19 pandemic - on Lisbon's public spaces. For both periods, we analyze primary sources - strategies, plans, projects, and papers - designed by Lisbon City Council and that depict the ideas and tactics to tackle the urban challenges imposed by the public health crises. With this research, we discuss the impact of public health crises on public spaces policies design through two particular examples in Lisbon, from the 19th century and the current days. Furthermore, we question if these crises served, to any extent, the intentions to qualify public places and introduce a new form and image on Lisbon public spaces.

THE SANITARIAN CRISIS AND THE TRANSFORMATION OF THE PUBLIC URBAN SPACE

Epidemics cause radical changes in people's lives. They follow each other with more or less impact, changing the behavior of the individuals subject to them. Observing the main epidemics that have occurred since the 19th century and the deaths resulting from them, it is important to highlight the effects of the Cholera outbreak and Yellow Fever (1856-1857), HIV / AIDS (1981) and, recently, the COVID-19 (2019) Pandemic.

The high density of inhabitants and activities in a limited space represents one of the main challenges for urban areas that are affected by viruses. During the early stages of the of the Covid-19 spread in Europe, several implications for urban planning were noted. Data on the spread of this pandemic shows that urban areas are significantly affected by Covid-19 (90% of cases were identified in urban areas) [1]. In Portugal there are records that show that: “the diffusion process started in the densest urban areas, followed by the frontier areas and, later, spreading to the territories of lesser demographic density and higher age” [2].

As during the mid-nineteenth century, in the coming decades we will see an increase in urban centers: “for example, major urban centers such as Wuhan and Paris are shooting upward of 11 million dwellers. By 2050 there are projected to be 43 such megacities, and more than two-thirds of the global population could be living in urban areas.” [3](p. 317). The people's choice to live in large urban centers has harmful consequences when epidemics occur. Housing density is virus-friendly. However, having more people in less space does not necessarily mean more risk. The transmission of epidemics thus occurs more intensely in urban spaces, because they are normally dependent on trade routes [4]. Added to the problem of population density is the dilemma of aging. The global population is aging fast. According to the projections of the World Health Organization, people over 60 will reach two billion in 2050, more than twice the elderly population registered at the end of 2019. As we know, aging is associated with greater vulnerability in the face of epidemics. The changing demographic structure is a complex

issue that must be addressed by local and national authorities. Aging must be supported with specific approaches and solutions.

City governments must study urban experiences in the world, considering that sometimes temporary measures can lead to improvements in our cities. After the emergence of COVID-19, we experienced changes in urban living [5] and positive effects for the environment of cities, namely: i) we have seen the promotion of teleworking (there was a perception that much of the work and meetings can be solved online, reducing pollution and unnecessary displacements); ii) we have seen a reduction in the impact of greenhouse gases in the atmosphere, and an improvement in air quality in urban centers, as a result of mobility restrictions; iii) we have improved digital tools for work and teaching, especially at a distance.

Based on data from EUROSTAT 2019 a recent study [6] analyzes the percentage of the aging population in ten European capitals (Amsterdam, Berlin, Brussels, Copenhagen, Dublin, Lisbon, London, Madrid, Paris, Rome). From this analysis, Lisbon stands out as the capital with more people over 80 years old. This work contrasts these records with the percentage of green spaces existing in these capitals, where it is concluded that the Portuguese capital has a low area of green spaces (6%) compared to the other capitals like Paris that provides its inhabitants with 17% of green spaces or Brussels with 16%. It is believed that the current temporary measures caused by COVID-19 may redesign our cities. The need to free up more street space for pedestrians and cyclists has contributed to greener and more integrated cities with a low carbon economy [7].

We know that political decisions have an impact on citizens lives: “Public policy is whatever governments choose to do or not to do” [8]. The first fact of the *polis* is the policy of its construction [9]. So, whether we like it or not, the future of cities always depends on political decisions. It is, as Rossi [9] says: “Politics, in fact, constitutes the problem of options here. Who ultimately chooses the image of cities? The city itself, but always and only through its political institutions.” The proceedings of governments in the face of pandemics will serve to analyze the organization and authority of this political power [10].

In view of the current pandemic moment and knowing the importance of public spaces in the formation, experience and maintenance of cities, several questions can be asked: How should we live in cities after a pandemic? Can COVID-19 change the way we think about cities? Can it be a turning point for urban development? Are we going to promote COVID-19 as the kick starter for urban equality opportunities?

Lisbon’s transformation was the result of tensions and commitments between different actors (public authorities, technicians, businessmen), and various impulses (health and economic). Next, we to analyze two moments in its history associated with epidemics (the Epidemic Crises and Yellow Fever (1856-1857) and the COVID-19 (2019) Pandemic), showing to what extent these events influenced the development of the city.

THE EPIDEMICS AND THE RISING OF THE BOURGEOISE LISBON AT THE END OF THE 19TH CENTURY

By the end of the 18th century, the Western World underwent several changes that affected transportation, industry and, consequently, the distribution of the population, with the emergence of the Industrial Revolution, which has its main scenario in England. Gradually, the rest of the European countries joined in adopting the new technologies.

The Industrial Revolution results from the substitution of manual labor by the machine, which brought about a transformation of society. In view of the better living and working conditions, there was a demographic increase and as a consequence a demand for accommodation by the working class in large cities or in their surroundings, close to the manufacturing facilities. On the other hand, in the current age city, due to greater autonomy in travel, the choice of places of residence is independent of the place of work. As a consequence of these new ways of life, the design of cities changed: “Industry, the source of all evil and all good, becomes the real protagonist of the transformation of the city” [9].

During the 19th century, industrial development in Portugal did not proceed as in other countries - industry was not the main activity of its economy [11].

It is not always possible to identify changes in the structure of public spaces after a pandemic crisis or epidemic outbreak. The 19th century was the century of the great pandemics, of the 17 outbreaks with excess mortality in the city of Lisbon, during the 19th century, the 1833 morbus cholera epidemic [4] [12] stands out. This epidemic led to the construction of two large cemeteries (Prazeres cemetery and Cemetery of Alto de São João).

Advance of industrialization during the second half of the 19th century, saw people leaving the countryside for the city and witnessed a demand for low-cost housing in Lisbon and Porto (Portuguese cities with the highest index

of industrialization). The new houses were being built during this period, not by the government, but by philanthropic societies, industrialists and, above all, private builders [13].

Since the middle of the 19th century cities became denser and in some metropolises such as London, the city's public areas also began to be built and peripheral neighborhoods appeared [14]. In and out of the cities the working class was looking for any type of accommodation. Most of the neighborhoods that are built in this period do not obey urban rules and presented different problems. So, Friedrich Engels' [15] description of England for this period does not differ from the scenario of many other countries, where the houses were fully occupied, were degraded and were built with the sparsest materials. The relatively tolerable hygienic characteristics in the countryside become unbearable in the city, due to the high number of new homes and their proximity.

The urban physiognomy of industrial cities is directly related to the increase in the number of inhabitants. The first census of the Portuguese population carried out in 1864 estimated 163 763 inhabitants in Lisbon and in 1890 the number of its inhabitants had more than doubled to 391 206 inhabitants [16].

Antunes [4] says that it is possible to design for Lisbon in the 19th century a “geography of death” defined by the place of residence and the socioeconomic segment.

In the middle of the 19th century, Lisbon was also experiencing unhealthy problems, as the city did not yet have a sewage system, its houses were of poor quality, the food system equipment (slaughterhouse and markets) unhealthy and the Tagus river received directly discharges from factories that were installed on its banks. Nearly annual epidemic outbreaks appeared in the Alcântara area, due to the pollution of the Alcântara stream. The old neighborhoods in the capital were “sick”: “In the light of the hygienist theories of Eight hundred, these neighborhoods were ‘sick’ and the diagnosis of the disease resulted in the absence of the most basic system of sanitation ...” [6]. Such was the case that the municipality considered destroying the old neighborhoods of Lisbon, such as Mouraria, Bairro Alto and Alfama [6].

It is in a context of great precariousness, characterized by the unhealthy working-class housing, that between 1856 and 1857 both the epidemic crises and yellow fever arose [17]. During these two years, there were about six thousand deaths in Lisbon, which led to different actions, namely to a congress organized by the Academy of Sciences - The Sanitary Congress of 10 December 1857, where engineers and doctors were present to discuss the preeminent issue [17].

This congress results in the 1858 report [18] in which the Lisbon City Hall engineers, Pierre-Joseph Pezerat and Joaquim Júlio Pereira de Carvalho, director and sub-director of the Lisbon City Hall Technical Bureau, contributed with a novel way of thinking about urban planning [17]. Thus, improvements were outlined in the infrastructures to solve the hygiene problems and a policing system was created to supervise polluting activities [18].

The report serves as a working basis for the 1864 General Improvement Plan for the Capital. In the 1858 report an observation is made of the high prices for house rentals, and states the construction of housing as an essential necessity for workers [17].

One of the most striking aspects of this 1858 report concerns the rules for the construction of new streets. It stipulates more stringent measures than in the Haussmann regulation for Paris of 1852 (Decree of 26 March 1852 - Fundamental legal instrument of the urban renewal and beautification of the French capital of the 2nd empire) [17] (Tab. 1). Thus, it defines that the height of the houses should be regulated by the width of the streets, indicating for streets of 10 to 15 meters the maximum of 2 floors, for streets of 15 to 20 meters 3 floors and with more than 20 meters that they should not overtake 4 floors [17].

On December 31, 1864, after several requests from the Lisbon City Council, the decree that drew up the General Plan for Improvements in the Capital, which included the Ministry of Public Works, the City Council and the Public Health Council, is published. We highlight the collaboration of the engineer and municipal architect Pierre Joseph Pezerat (1801-1872). Within the scope of the Commission's work, Pezerat is still carrying out a preparatory study, dated 1865, entitled “Mémoire sur les Études d’améliorations et embellissements de Lisbonne”, but which was not followed up [19].

This General Improvement Plan had as its general strategies the use of expropriation, the improvement of sewage systems and water supply [17]. The Plan also provided for, i) rules for the height of buildings (Tab. 1), ii) creation of parks and gardens and iii) parking spaces for chariots and other vehicles [20]. With this plan supervision of construction becomes mandatory and this also imposes that construction plans are submitted to the municipality prior to construction [17].

In a policy of hygienist and “embellishment” of cities, and in line with international concerns and initiatives, the City Council of Lisbon begins a systematic afforestation of the city. In 1865, more than 6000 trees were planted in Lisbon and another afforestation was proposed for Praça do Comércio [19]. At the same time, CML beautified the

public space through the decorative paving of sidewalks and walls and the coating of many facades with industrially manufactured tiles [19].

The General Plan for Improvements in the Capital (1864) (Tab. 2) required new streets to be more than 10 meters wide and with less than 7% gradient [21]. However, with the Law of July 2, 1867, it was possible for streets with a width of 7 meters and facades with a height of up to 20 meters. Since this rule was only revised with the Regulation on the Health of Urban Buildings, published in the Decree of 14 February 1903 [21].

TABLE 1. Streets width and height according to 19th-century regulation.

Streets' width	Buildings' height		
	Paris, 1862	Lisbon, 1864	Lisbon, 1867
< 5m			< 12m
< 7m		< 8m	< 15m
7-10m	< 14,6m	< 12m	< 20m
10-18m	< 17,55m	< 16m	< 20m
>18m	< 20m	< 19m	< 20m

In 1879 the municipality of Lisbon decided to extend the city in the direction of the north-northwest axis with the construction of Avenida da Liberdade [22] and the new avenues inserted in an urban plan designed by engineer Ressano Garcia (1847-1911), a follower of Haussmam (1809-1911). In this period, Parisian projects influenced countless architects: "... it is essential to specify that the influence of Paris immediately is a constant in the programming of European capitals from the end of the 19th century." [22]. This plan that begins with Avenida da Liberdade dates from 1888 and makes the connection between this avenue and Campo Grande. It is built on an orthogonal mesh, with regular blocks, but of different dimensions, which articulate in the best way with the terrain. It is marked by wide avenues (Av. Da Liberdade, Av. Fontes Pereira de Melo and Av. da República) structured by two large voids (Marques de Pombal Square and Duque de Saldanha Square) [23]. The genius of this project remained in the structure of the plan, with no altimetry being defined for the buildings, nor having a definition of typologies for it, the built gave way to "a plurality of aesthetic design" [22](p. 36).

TABLE 2. Urban planning in Lisbon: legal and technical aspects - 19th and 20th century.

Year	Plans and projects	Author
1764	Public Promenade Project	Lisbon City Council
1833	Prazeres Cemetery Alto de São João Cemetery	Lisbon City Council
1830-1840	Enhancement of the Public Promenade	Lisbon City Council
1837	Establish a new method for the city's rebuilding and beautification plan	Lisbon City Council
1842	Project for Jardim da Estrela	Malaquias Ferreira Leal João Francisco da Silva
1852	Project for Jardim do Príncipe Real	Arq. José da Costa e Silva
1858	Health Congress Report that regulates the height and width of the streets	Pierre-Joseph Pezarat Joaquim Júlio Pereira de Carvalho
1858	Boavista landfill works	José Vitorino Damásio

Year	Plans and projects	Author
1860	Finished the Garden of S. Pedro de Alcântara	Lisbon City Council
1864	General Plan for Capital Improvements	Ministry of Public Works Commission for the Plan for Improvements Pierre-Joseph Pezerat Joaquim Possidónio Narciso da Silva José Augusto Correa de Barros
1865	“Mémoire sur les études d’amélioration et embellissements de Lisbonne” Afforestation Proposal for Praça do Comercio Paving of sidewalks and sidewalks and the coating of facades	Pierre-Joseph Pezerat Lisbon City Council
1867	Law of July 2, 1867 Restores the vertical growth of the old city	Ministry of Public Works Andrade Corvo
1869	The Príncipe Real Garden is finished	Lisbon City Council João Francisco da Silva
1885	General Improvement Plan	Lisbon City Council Pierre-Joseph Pezerat Joaquim Júlio Pereira de Carvalho Joaquim Possidónio Narciso da Silva Guilherme da Silva Aberrantes
1888	New Avenues Plan	Lisbon City Council
1903	General Improvement Plan Regulations on the Health of Urban Buildings	Frederico Ressano Garcia

THE COVID-19 PANDEMIC AND THE CONSTRUCTION OF THE LISBON FOR PEOPLE

From the end of the 1980’s to the 2000’s, and after decades of public space transformation to ease car park and circulation, Lisbon City Council rehearsed the pedestrianization of some central public spaces: Praça do Comércio/Terreiro do Paço, Rua Augusta, Rua das Portas de Santos Antão and Avenida Conde Valbom, these last two only partially. These interventions privileged the commercial value of these public spaces, just as it happened in other western cities [24].

Besides these experiences, the world exhibition (Expo’98) and the opportunity to create a new Lisbon neighborhood constituted a milestone in Portuguese urbanism. As a unique opportunity to create a new urban area from the ground, the exhibition area of the Expo’98, was an opportunity to rethink the form, role, and function of public space in future Portuguese cities. And this was particularly important for the design of public spaces in riverfront areas dedicated to leisure and tourism. The rehabilitation of the Expo’98 area, subsequently renamed to *Parque das Nações* (Nations Park), combined public space recovery and humanization of the city scale, considering the neighborhood livability, which the subdivision into 6 different Urbanization Plans.

In the 21st century, the Lisbon Strategic Charter 2010-2024 suggested rediscovering Lisbon as a city of neighborhoods combined with the metropolitan scale. This view combines the neighborhood scale and its (micro)centrality: a public facility, service, or, in what concerns urban design, the public square. The city strategy was developed alongside the Local Development Plan review process, which also includes the city of neighborhoods perspective.

This perspective incorporates the observations made by urbanists since the 1960s. Urbanists defended the pre-existence or traditional city centers against the modernist schemes and proposals. Those schemes recommended the destruction of the traditional city to answer its problems: congestion, unsafety, street wideness, for example.

Jan Gehl developed his alternative analysis and proposals [24] [25] stretching a different perspective on urban life and observed cities in 5-D as human and living units and not as a compilation of individual buildings, elements, and zonal functions that can be organized and distributed within a rational logic. This modernist scheme took support on cars and high-capacity roads and freeways, without acknowledging its later heavy environmental, social and economic costs: pollution, traffic, road unsafety.

To reconquer the city and promote the city for people, according to Gehl [24] [25], the car should be restricted to restore public space multifunctionality. The intervention in Avenida Duque d'Ávila, in Lisbon, in 2011, portrayed these principles shifting the usual mobility scheme. This avenue went from dedicated to car traffic to a (mostly) pedestrian public space with outdoor cafes and bike lanes.

After this project, in 2014, the Lisbon City Council presented the program "Uma praça em cada bairro (A square in every neighborhood)" which sparked Lisbon's strategy as a city of neighborhoods with public space that promote proximity, active mobility, and neighborhood-scale dynamics. This program classified 150 public spaces that can encourage local dynamics in Lisbon. Even though there were 30 priority interventions, in 2020, before the COVID-19 pandemic, only 13 of these interventions were finished.

TABLE 3. Plans and projects for Lisbon public space.

Year	Plans and projects	Author
2008	Lisbon Riverfront Requalification Projects	Frente Tejo, S.A.
2010	Lisbon Local Development Plan	
	Lisbon Strategic Charter	
2013	Lisbon Pedestrian Accessibility Plan	
2014	“Uma praça em cada bairro” Program	Lisbon City Council
2018	“Lisboa: o desenho da rua” (Public Space Manual)	
2019	“A rua é sua” Program	
	MOVE LISBOA 2030: Mobility Strategic Vision	
2020	Plan for public space transformation	

Lisbon has been affected by the impact of tourism dynamics in its public space policies [8]. Particularly in the historic center and riverfront area where new (or renewed) public spaces were designed – *eg* the Ribeira das Naus project or the new Lisbon Cruise Terminal. The sequence presented in tab. 3 illustrates the cumulative strategies, plans, and projects that enhance the need for transformation of Lisbon’s public spaces qualifying the city life and city dynamics, throughout the 21st century.

The COVID-19 pandemic interrupted the social and economic urban dynamics. As it happened in the 19th-century health crises, managing public health in dense and compact cities is particularly challenging. Even though new technologies enable new work and sociability platforms, cities face disruptions caused by the COVID-19 pandemic. With its density, cities were particularly affected by this pandemic (as they were by the previous ones) and it ends demonstrated cities' exposure to high transmission viruses [4].

The lockdowns, to stop the virus spread, created a new experience and landscape where world cities are pictured empty and silent. Within cities, some areas are more affected in association with their social, economic, and urban morphology characteristics. That happened, for example, in Lisbon downtown due to its tourism growing dynamics over the past years [8].

This ground zero experience stands as an opportunity to rethink urbanism. Some cities, including Lisbon, are driving forums on how cities can better address the problems imposed by COVID-19. The social, economic, and

environmental challenges that were already a cause of debate before the pandemic, are now framed within a restart opportunity because of the pandemic.

Other questions arise from what we can call the "fear of crowdedness". Whyte [26], in his studies on public space, had exemplified that the crowdedness feeling depends on individuals judgment. At the moment, there are variable legal restrictions on social gatherings and a stricter number of people that can be indoors. But after the pandemic is under control, will there be a change in our crowd awareness, like fear of agglomeration? And if so, how will cities answer?

In this moment, these restrictions are causing a demand for public space areas. The fear of infection makes public spaces particularly relevant to the social gathering, but also for the economic city life. In the vicinity of shops there is more space occupied for shopping lines or take-away services or in the case of coffee shops there is an increasing outdoor area demand.

Public parks and other green areas are getting more value for their contribution to well-being and mental health by diminishing stress caused by lockdowns [27]. It is also important to recall that green urban spaces result from the 19th-century health crises and were adopted by urbanists to improve cities in terms of air and life quality [27].

Even though it is early to assess the full impact of this pandemic on urban sustainability [28], it is clear that, as in the 19th-century health crises, COVID-19 can foster changes in working and living habits [6]. If, because of the COVID-19 pandemic, public spaces and pedestrian areas are increasingly significant for safer city social and economic dynamics, how is Lisbon addressing its public space policies?

In June 2020, a month after the end of the first general lockdown in Portugal, Lisbon City Council presented the plan for the public space transformation to "avoid the increase of individual transport and pollution" [29]. The health crisis was the trigger to increase pedestrian areas (wider sidewalks) and promote active mobility. The announced plan combined strategies, projects, and programs for Lisbon public spaces developed in the last decade and focus on two programmes: "A rua é sua (The street is yours)" Program and "Lisboa ciclável (Cycling Lisbon)".

With the COVID-19 pandemic, there was no disruption or shift because valuing public spaces was already a tradition and not the result of the current health crisis. Instead, the Lisbon City Council reviewed its strategies for the public space and unlocked the debate on the consequences of the current mobility scheme where cars are still prominent. According to the European Cycling Federation [30], Lisbon was the 7th city to announce more km of public space interventions, mostly new cycle lanes/tracks [30].

The Program "A rua é sua" identified 100 streets where the pedestrian area increased (5837 m² until march 2021) through tactical urbanism interventions and suppressing car traffic and parking area. In the case of "Lisboa Ciclável" it proposed to allocate 67km new bike lanes in Lisbon until April 2021, though only 12km are completed [30].

Lisbon was European Green Capital 2020 and the Lisbon City Council announced the opening of new parks in 2020: Biblioteca Nacional Garden, CGD Garden, Monte das Perdizes Park and Quinta da Alfarrobeira Garden. The last two mentioned are still under construction.

Contrarily, Lisbon City Council decided to postpone the car limitation in Lisbon downtown that was announced to transform that area into a Zone of Reduced Emissions. Even though it might seem a decision that contradicts the global scheme designed for Lisbon public spaces, this decision stretches the fact that Lisbon downtown was particularly affected by the pandemic, due to its relation towards tourism as Barata-Salgueiro pointed out [6].

The analysis of documents and strategies, indicates that there was not a change of direction in Lisbon public space policies. On the contrary, the Lisbon City Council designed a plan based on the previously announced plans and accelerated their concretization. Even though there is a gap between the announced measures and the achieved ones, what is noticeable is the path to answer the "Cities for people" approach by building more pedestrian areas and stimulating active mobility and wellbeing.

CONCLUSIONS

Starting from the hypothesis that pandemics can change the way we use and design public space, in this article we show which urban measures were adopted after the main epidemics of the 19th century (Cholera in 1855-56 and Yellow Fever in 1857) and 21st century (COVID-19) in Lisbon.

It is important to note that some of the recent urban measures taken by the Lisbon City Council for public spaces, in view of the constraints arising from COVID-19, arise in continuity with the improvement operations that this entity has been carrying out since 2014 (with the program "A square in each neighborhood") in the city of Lisbon. The 2020 interventions (post COVID outbreak) in public spaces in the city of Lisbon were the completion of

projects related to the program “A square in each neighborhood” (Example of Praça de Espanha) and surgical operations in the oldest areas of the city.

It was shown that the urban planning rules established in the post-pandemic reform from 1855 to 1857 (General Plan for Improvements in the Capital of 1864) were not fully complied with. In any case they pointed a path for Lisbon’s renovation needs. The 20th century brought to execution many of these improvements together with a batch of novel legal documents (Health Regulations for Urban Buildings).

Will COVID-19 contribute to a radical change in contemporary urbanism?

Population aging and population density are associated with greater vulnerability to epidemics.

At this juncture, it is essential that local, national and international governments understand the effect of urban experiences underway in city areas around the world, considering that sometimes temporary measures can teach us about the possibilities of reform.

The authors [3] [6] [7] who have investigated the effect of epidemics on the life of European cities show that the practice of urban planning implies a combined audit that considers the quantitative and qualitative aspects of basic urban services, that is, services within the competence of the municipal administration.

Thus, given the pace, scale and diversity of the transformations that are taking place in the world, it is important to measure changes in the use and perceptions of public spaces during the following months, in order to inform city planning decision-makers in the future.

Considering the role of public spaces in socialization, community building, and identity formation, in the post-COVID city, policy makers should continue to value these spaces. Finally, and thinking positively, it is important to bear in mind that cities are places that create problems for which, simultaneously, solutions are devised.

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