A Study on the Formation of Kaohsiung City, Taiwan

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Abstract
The formation of a city is the civilization process of history, architecture, urban policy, local culture and economy development. During the evolutorial process, each individual stage has its critical factors which influent the formation of the fabric, space, form and structure of the city. The formation of a harbor city is even more dramatic not only in geographic and history background, but also in the urban offshore policy, urban planning and the social economy later on. It takes four hundred years of five different regime authorities, and transforms Kaohsiung from a fishermen’s shelter to a modern international harbor city. And nowadays, Kaohsiung City has been transformed into the second largest city in Taiwan, also the eighth container terminal in the world. The influential factors during the development process and how they formed the harbor city are what this study is trying to find out.

Keywords: Kaohsiung City; evolutional process; formation; influential factors.

1. Introduction
Most of the coastal cities in Taiwan originated from cargo trading at the beginning of the 17th century. Each had its innate conditions and acquired transformation during its evolutional process. Kaohsiung City was one of the most successful and dramatic ones. And furthermore, because of its natural and geographical advantage, Kaohsiung has played an important role in the history of Taiwan. The colonial period under Japanese governance was a very important era. Being the first colony of the Japanese Empire, Taiwan was planned and actively constructed by Japanese authorities. As an important harbor, Kaohsiung was the first priority and the focal point. Being a successful international commercial and industrial port, there were some unique characteristics and critical factors which affected the formation of the harbor city. In the evolutional process of Kaohsiung, political issues and commercial profits have always been the main factors. Along with the history of Kaohsiung city and the urban context, the formation of a harbor city was unveiled.

2. Development Factors of the Harbor City:
2-1. Location and Geographic advantages:
In the 16th and 17th centuries, the era of European navigators, the colonists expanded their trading and colonial territory overseas with their shipbuilding skills and fearless ambition. South-East Asia soon became the battlefield of the colony race. Taiwan was the perfect stepping stone for the plan to colonize China and the other island countries nearby. With perfect geographical location, Taiwan had become the target of those ambitious aggressors. By the early 20th century, the power of the Japanese Empire had become strong and aggressive, and yet the ambition of those European navigators never stopped. The
fate of Taiwan became turbulent, and it all stemmed from having the ideal geographical location to the neighboring countries of South-East Asia. And Kaohsiung, a natural harbor of a perfect geographical location had become the target of all the ambitious aggressors.

2-2. Trading and Political advantages:

In the early stages of the harbor (1863-1894), Kaohsiung (高雄) harbor was opened to foreign businessmen from Britain, France and Germany. Some countries appointed ambassadors to Kaohsiung or set up settlements, offices and warehouses in Kaohsiung. International trade in Kaohsiung Harbor was very prosperous. On December 26, 1863, the Qing (清朝) government set up a customs branch in Chihou (旗後), as we call Cijin (旗津) now, and appointed a British official to take charge of the taxation office. Kaohsiung was transformed from a small fishing village into a main international harbor.

In 1895, the Japanese seized Taiwan and adopted colonialism policies in both the economic and political arenas. On one hand, Japan aimed to control Taiwan politically, economically and militarily, but on the other hand; they actively developed Taiwan’s resources such as rice and sugar to supply the demand of the Japanese economy. Much emphasis was also placed on the development of the economic infrastructure such as the construction of railways and highways, as well as the Kaohsiung (高雄) and Keelung (基隆) harbors. These industrial infrastructures and policies of city planning have actually affected the development of Taiwan up through to the present day.

2-3. Economic Evolution:

In the 16th and 17th centuries, goods and cargo trading between Taiwan, Dutch, Japan and Mainland China were mainly agricultural products such as sugar, rice, deerskin, pepper, condiments and so on. Among these agriculture products, sugar and rice were the most mass-produced harvests in southern Taiwan. And Kaohsiung, the main international port in southern Taiwan became the most important transit port. Because of the advantage of geographic location, Kaohsiung had become a stepping stone and transfer port in South-East Asia. In the decades of the Japanese colonial period (1895-1945), Kaohsiung had been transformed from a sea-shore trading port into an export harbor with agricultural and farming hinterland. The development and farming area of Kaohsiung was gradually expanded into the hinterland and further counties. The railroad system expanded along the farming area of agriculture products for transporting products to the port for shipping overseas. The transportation of agriculture products stimulated the economic development of Taiwan. The railroad system expanded from Kaohsiung to other cities for cargo trading, it also expanded the city area toward the hinterland for a modern city scope. In the mean time, the position of Kaohsiung (Ta-Gao 打狗) during Japanese colonization was more than that of a trading port. It was also an industrial and military defense city as well. The Japanese governor kept constructing the industrial infrastructures and harbor enhancement during the colonial period. In 1907, the beginning of the New Harbor Enhancement Plan was brought into practice and the total volume of trade of Kaohsiung (Ta-Gao 打狗) exceeded An-Pin Port, which
for the first time became the second busiest port in Taiwan. After World War II, the Kuomintang (KMT 国民黨) became the governing political party of Taiwan. In 1949, Taiwan’s new government kept developing the infrastructure and with the construction of the heavy industry park, Kaohsiung became one of the most important industrial cities in Taiwan, thrusting Kaohsiung ahead toward becoming a modern international city.

2-4. Transportation System:
The transportation system is a critical factor in the development of a cargo-shipping city. The development of the transportation system determines the space structure of the city as well. With the evolution of politics, society, technology, the economy and culture, the transportation system spreads along with the city demand and gradually determines the city skeleton for future development. Since Kaohsiung is a harbor city, there has always been a main transportation system for import and export cargo shipping since it was established. The transportation for shipping cargo throughout the harbor area and between cities had been an important factor in the formation of a city scope. The rail system was the first and most important transportation system in the evolution of Kaohsiung City. After World War II, along with the prosperous development of the industrial area, the highway system became even more efficient and popular. The railroad and highway systems connection to the industrial areas for the convenience of cargo transportation was an important image boost for Kaohsiung City. Now, at the beginning of the 21st century, the High Speed Rail has led the transportation system of Taiwan into a new era. Kaohsiung city, from now on, will be the hub of the transportation system in southern Taiwan.

2-5. Policy and theory of city planning under Japanese governance (1895-1945)
Japanese authorities made plans for the further development of Kaohsiung Harbor not only because of its ideal geographical location but also because Taiwan was a base for the colonial expansion to South-East Asia and a supply colony of agricultural products. The harbor enhancement, railroad transit system, urban planning and some other infrastructures were actively under construction. Also the population of Japanese increased rapidly with the expansion and the harbor infill project. Most of them were governors, policemen, military and businessmen. They all came for the expansion and development of the harbor city. New theories of urban planning, policies, economic policies and new science categories were learned from the West during the Meiji Restoration. Taiwan, as the first colony of Japan after the Meiji Restoration（明治維新）(1868) became a new practice field for the city planning theories they learned from the West.

2-5-1. Policy of city planning under Japanese governance:
The development of Kaohsiung City had an intimate relation with the harbor and railroad systems. The policy of city planning of Kaohsiung originated from the benefits of the harbor and the transportation system along with the expansion of the city. After fifty years of colonialism under the Japanese Government, not only had the basic structure of the city been firmly established, but also the ordinance
and the statutes as well. These various laws and decrees still influence Taiwan’s enactment system. The City Planning and Building Code are typical. Kaohsiung, the first and foremost modern city in Taiwan, is a good example to study the policy of city planning and how it can transform the image over time.

**Harbor enhancement construction:**
The harbor does not exist alone. It works as hub in a specific system. Kaohsiung Harbor used to be swamp land along the inner harbor area (Fig 1.). The dredging of the waterway and inland filling for piers and the railroad station were earnestly under construction at this time. Hamasane (哈瑪星), was established as the administrative community and the harbor railroad station. The filling of the swamp land, building warehouses, harbor facilities and dredging waterways for harbor shipping were the main harbor enhancement construction tasks. As an important harbor city in Taiwan, and also in South-East Asia, the harbor enhancement construction was certainly the most important task in the planning of Kaohsiung City.

**Railroad transit system and the land-filling structure of the harbor area:**
The Railroad transit system was mainly for the import and the export transportation of inland products such as sugar, wood, rice, camphor and several agricultural products over the years. For the benefit of the trading economy, land-filling and the railroad transit system were critical issues for harbor construction. Hamasan (哈瑪星), the community on the new land-filled area, in terms of the Japanese, meant having railroads along the coast. The convenient location helped make it the most progressive commercial area under Japanese governance. For the first time in Taiwan history, a well-planned railroad community was established. The main purpose of the railroad transit system was to transport the agricultural products of the island off-shore, and work as a whole with the harbor facility. The land-filling structure of harbor area and the infrastructure of the railroad transit system were then the most critical issues for the trading harbor.

**Urban reform plan under Japanese governance:**
There were 3 Urban Reform Plans during the period of Japanese Governance. The First Urban Reform Plan was in 1908, it covered the West area of Ta-Gou (打狗) River, which was in the Shin-Pin District (新濱町), population 42,000. The Second Urban Reform Plan was in 1921 (Fig.2), in the East area of Ta-Gou (打狗) River, the Zon District (榮町) where the City Government was located, population 116,000. In 1936, the street pattern and special structures of Kaohsiung were in a grid pattern with a radial system for the convenience of dominating a colonial territory. Cijin (旗津) with its limited area still remained as a fishing and trading village. The location of Hamasan (哈瑪星) was at the mouth of the port and the exit of the river ran through Kaohsiung, an ideal location for being an administration area. Japanese authorities created Hamasan (哈瑪星), the first Japanese community in Taiwan, together with the railroad station and system connecting with the inland of Kaohsiung City. The policy of city planning and the special style of the community followed the traditional Japanese style and the
infrastructure was constructed in a very modern way. Electricity and water systems, schools, police stations, shops, hospitals and so on. Hamasane (哈瑪星) has since become the most comprehensive modern community ever in Taiwan.

2-5-2. Theory of city planning under Japanese governance:
The city planning of Kaohsiung was brought into practice after the Meiji Restoration (明治維新) (1868). Japanese carried out the new city planning theory they learned from the West in her first colony, Taiwan. Kaohsiung City, the most important harbor in south-east Asia, had been a perfect field for the new theory of city planning. Under this backdrop, it would be easy to understand and analyze the theory of city planning of Kaohsiung. According to the city plan of Kaohsiung, there are 3 main planning systems in Kaohsiung City: Grid Pattern System, Patterns and Layers of Road System and Arcades along the street. All of the planning systems established the structure and infrastructure of the city, and they are still in use nowadays.

2-5-2-1. Grid pattern system:
Hamasan, the first Japanese community in Taiwan, was the most well designed district ever. It was regarded as an administrative district at the beginning of the city planning. The infrastructure such as the sanitary system, electrical system, schools, banks, police stations, streets was well arranged. For the benefit of orientation and subdivision, the grid pattern was the most popular street system used in the city planning of Taiwan. Since Taiwan is located in the North Hemisphere, the sunshine comes in the building from the southeast in the morning and the southwest in the afternoon. The grid pattern system was not arranged in a north-south direction, but in one of approximately 45 degrees to the
north, in order to obtain sufficient solar radiation. Also the street blocks were divided into a rectangular figure for the rectangular building parcels.

2-5-2-2 Patterns and Hierarchy of the Road System:
The First Urban Reform Plan (都市改正計畫) (1908-1912) covered the West area of Ta-Gou (打狗) River and the Second Urban Reform Plan (1912-1926) dealing with the East area of Ta-Gou River, were in a Perpendicular mixed Rectangular Type (Fig.3). The Third Urban Reform Plan (1926-1945) (Fig. 4), the street pattern and special structure of City Planning of Kaohsiung was in a Perpendicular and Rectangular Type mixed Ring-Radiative system for the convenience of dominating the colonial territory. The Perpendicular and Rectangular Type was a scientific way of parceling the land for the row-house building system. There were 2 Patterns of Road System and 4yers of The Road System Plan under Japanese Governance.

2 Patterns of Road System:
Perpendicular mixed rectangular type and a ring-radiative system in the outer circle.
2 patterns of Road System Plan; Perpendicular mixed Rectangular Type and Ring-Radiative Type.
4 layers of The Road System Plan; Arterial street system, secondary street system, residential street system and boulevard system
2 patterns of Road System Plan:
(1) Perpendicular mixed Rectangular Type: All the roads are perpendicular to one another, the over-all orientation is either parallel or perpendicular to a main object or the geographical landscape, such as train station, railroad, river, hill or the harbor bank. For a more reasonable geometrical layout, some main buildings were planned as landmarks or city nodes, such as parks, schools, office buildings and the train station. Hamasan was planned earlier than the 3 Urban Reformed Plan. The blocks were smaller than the blocks in the Yen-Cheng districts and Kaohsiung City. For a more efficient traffic flow, the length of the rectangular block was adjacent to the main road and the width of the rectangular block was adjacent to the streets.
(2) Ring-Radiative Type: A radiative road system and an outer circle road system were formed as a spider web with a traffic island or a train station as the center. The outer circle roads were planned for traffic passing through, and increasingly enlarged the scope of the city as it grew over time.

4 layers of The Road System Plan:
For a smoother traffic flow, a hierarchy of the road system was planned,
(1) Arterial street system:
Main streets to the suburb were 30 meters wide, normally in a straight line or slightly curved. The major function was to link the cores of different cities.
(2) Secondary street system:
The major function was to reduce traffic on the arterial streets to the suburbs, also to provide a circulatory system for the city.
(3) Residential street system:
Streets (6-12 meters wide) within residential and business areas. The major function was to connect between neighbors to the main streets and the secondary streets.
(4) Boulevard system (or parkway system): 60-100 meters wide with trees and traffic islands in the center. The major function was to link between zoning areas and government institutions, further more was to present the image of a major city.

2-5-2-3. Arcades along the street:
Because of the rainy and sunny subtropical weather, arcades were also a very special and practical building element used in the streets of Taiwan. According to the building regulations under Japanese governance, the buildings adjacent to the street should leave a width of 1.8-3 meters for the arcade. It provides shade on sunny days and shelter on rainy days for pedestrians along the street. Since arcades provided such a practical space against the weather in the city, the regulations of arcades is still in use in Taiwan nowadays.

3. Study Methodology and Related Theory
The aim of this paper is to trace the history of the development of Kaohsiung as a harbor city, and
clarify the influential factors during the development process and how they formed the harbor city. Moreover, how the political authority, urban planning policies, economic evolution, geography forms, trading advantages and transportation system affected the harbor city’s structure, texture, districts and eventually the overall development process. The method of this study includes a brief review of the history of Kaohsiung over the past 400 years and the study of relevant literatures, theses and reports; investigations on district fabrics and the transportation system. According to the topic of this paper, the theory of Urban Morphology and Urban Geography is related. Urban Morphology is the theory of the physical form of a city, which consists of street patterns, building sizes and shapes, architecture, population density and patterns of residential, commercial, industrial and other uses, among other things. It especially focuses on how the physical form of a city changes over time. Urban Geography is a theory of how the urban site and situation affect the evolution of a city, mainly focusing on the relation between men and land.

4. The Development Process of Kaohsiung as a harbor city

The history of Kaohsiung as a harbor city can be divided into 4 stages.

(1) Fishermen’s shelter village
(2) Dwellings of immigrants, trading port township and international harbor
(3) Colonial harbor city under Japanese governance
(4) Industrial cargo and transit trade harbor city under KMT (國民黨), the Republic of China.

4-1. Fishermen’s shelter village

In the Ming Dynasty (明朝) (1522-1566), there was a rich fishing sea gorge between Taiwan and Mainland China. Fishermen were attracted to the area for fishing, but bothered by frequent typhoons. At that time, Taiwan was only a shelter from storms during the fishing season for the fishermen from Mainland China. Because of the frequent fishing, Taiwan became a permanent settlement instead of a fishing shelter. Immigrant dwellings grew into villages and port-townships on the offshore bar island, Cijin (旗津), near Kaohsiung Harbor. At this time, Taiwan was just an outlying territory of the Cing Dynasty (清朝).

4-2. Dwellings of immigrants, trading port-township and international harbor

In the year 1624 AD, Dutch people attacked and occupied Taiwan for 37 years for the benefit of trading and dwelling. In 1662, the general of the Ming Dynasty (明朝), Zheng Cheng-gong (鄭成功), popularly known in the West as Koxinga (國姓爺), a prominent leader of the anti-Qing movement opposing the Cing Dynasty (清朝), expelled the Dutch and recovered Taiwan in 1661 and established a base of operations on the island. Farming immigrants from Mainland China started moving to Taiwan to settle. The immigrant society was varied and complex. During the 17th to 18th century, trading ships from Europe and Asia were active along the coast of East Asia. The trading economy was transforming the fishing village into a port township. Kaohsiung, a natural port with good geographic location had
become a perfect trading port and a prominent target by ambitious neighbors. Zheng's (鄭氏) forces were later defeated by the Cing Dynasty (清朝) in 1683. Under the Cing Dynasty, at the beginning of harbor stage (1863-1894), Kaohsiung harbor was opened to foreign businessmen from Britain, France and Germany. Some countries appointed ambassadors to Kaohsiung or set up settlements, offices and warehouses in Kaohsiung. International trade in Kaohsiung Harbor was very prosperous. On December 26, 1863, the Qing government set up a branch customs office in Chihou (旗後), now known as Cijin (旗津) and appointed a British official to take charge of the taxation office. Kaohsiung was transformed from a small fishing village into a main international harbor. The Cing Dynasty ruled Taiwan for two hundred years before it ceded the island to Japan in 1895 following the first Sino-Japanese War (中日戰爭).

4-3. Colonial harbor city under Japanese governance
After the Sino-Japanese War of 1894-1895, Taiwan and the Peng-Hu islands (澎湖群島) were ceded to Japan and became a colony of Japan. Japan governed and ruled Taiwan vigorously by constructing infrastructures such as a railroad system, urban planning and harbor enhancement structures for the benefit of the economy and military defense affairs. During the period of Japanese governance, the structure and facilities of Kaohsiung harbor was actively under construction for the aggressive colonial policy toward South-East Asia. The structure of urban planning and original framework were formed and still affect the city planning of Kaohsiung.

The expansion of the city center from Cijin (旗津), Hamasan (哈瑪星) community, Yen-Cheng (鹽埕) districts across the Ta-Gao (打狗) River to Kaohsiung City, was a phenomenon of industrial evolution under Japanese rule. With the expansion, Kaohsiung City was transformed from a fisherman’s village, trading port-township into an international harbor. During this time, Kaohsiung City had totally replaced Tainan City (台南市) as the most important city in southern Taiwan.

![Fig. 5. The expansion of Kaohsiung City center from 1901 to 1938.](image)

The order of the expansion of Kaohsiung city was (Fig. 5.):
1901 Cijin (旗津) (Chihou (旗後)): As a fishing and trading port town-ship.
1912 Hamasan (哈瑪星): As an administrative district under Japanese governance.
1921 Yen-Cheng (鹽埕) district: As a business district.
1938 Kaohsiung City: Enlarged city area across the Ta-Gao（打狗）River to the east side.
A modern city with an extensive hinterland.

4-4. Industrial cargo and transit trade harbor city under the Republic of China

Following World War II, the Republic of China, under the Kuomintang (KMT 國民黨) became the governing body on Taiwan. In 1949, after losing its former territories following the Chinese civil war, the ROC government under the Kuomintang (KMT) withdrew to Taiwan. Japan formally renounced all territorial rights to Taiwan in 1952 in the San Francisco Peace Treaty. In 1945, Taiwan was restored, but due to the war, Kaohsiung Harbor was devastatingly destroyed. In December 1945, the Kaohsiung Harbor Bureau (KHB 高雄港務局) was established to take charge of the task of the restoration work of the harbor. In 1955 the harbor resurrection was completed. In 1958, KHB began a twelve-year, extended project to reclaim 544 hectares of shoreline to facilitate the rapidly increasing trade volume. From the history of different regime authorities, the KMT government realized the importance of Kaohsiung harbor to the coastguard and international trading. A continuously recovery and enhancement program was aggressively underway. Dredging and filling enlarged the scope of the harbor and the number of piers. In accordance with the instructions of the late President Chiang Kai-Shek（蔣介石）, the construction of the second harbor was completed in 1975 to enhance the function and operation of Kaohsiung Harbor, allowing hundred-thousand ton ships to pass through freely. At the same time, the development of the Kaohsiung Export Processing Zone（高雄加工出口）, Chien-chen Fishing Port(前鎮漁港), LinhaiIndustrial Park（臨海工業區）had subsequently integrated a steel-making factory, a million-ton shipbuilding yard and No.1 ~ 4 Container Terminals. Kaohsiung Harbor has been a multifunctional harbor city ever since. For the comprehensive circulation of a harbor city, connecting the offshore Cijin island with Kaohsiung City had been a critical task. The Cross Harbor Tunnel（過港隧道）was then built in 1984, allowing direct truck access to the island. In 1989, due to heavy container loading volume, Container Terminal No.5 was put into construction and completed in 1990. The Port of Kaohsiung encompasses five container terminals with an annual handling capacity of 10 million TEU, the Port of Kaohsiung is able to handle shipments quickly and efficiently with updated facilities, equipment and supporting software. The R.O.C. government of Taiwan is actively promoting Kaohsiung Port as an Asia Pacific transshipment shipping center, global logistics management center and free port.

5. The transformation of city structure after World War II:

Through centuries of development, most of the city’s fabrics and textures had been transformed into highly concentrated patterns in the city-core. During the colonial period, the modern planning methodology applied in the city planning of Kaohsiung kept the city in an orderly arrangement with a fair infrastructure and transportation network which led Kaohsiung City to become the metropolitan center it is now. The expansion of Kaohsiung City during Japanese rule was to meet the demand of the harbor development, and the railway system was the implement. As the expansion of Kaohsiung City
after KMT governance was mainly led by the establishment of heavy industrial parks, major public
facilities and residential development in the suburban areas. The expansion effectively released the
high density in the downtown area. Highway and speedway systems were the implements applied in
the expansion of Kaohsiung City after World War II. To the north, there were heavy industrial parks
such as Nan-Zih processing factory park (楠梓加工區) and Kaohsiung oil refinery. To the south, there
were Kaohsiung Cian-Jhen industrial park (前鎮工業區), Siao-Gang International Airport (小港機
場) and offshore industrial park. All of these major new public facilities attracted the increasing
population and infrastructures. The development of nearby residential areas, new townships and
communities gathered around these major public constructions. A successful Industry Leading policy
was applied in the North and South of Kaohsiung City for the expansion issues. The structure of a city
is mainly consisting of the function, hierarchy and distribution of the road system. In the colonial
period, the basic structure of Kaohsiung City had been well planned and designed.

Now with 60 years of expansion, the economy, industry, and urban planning have largely increased and expanded. The city scale is much larger and the railroad transportation system was replaced by the rapid highway system. Meanwhile, the increasing city structure was established along with the expansion of the rapid highway system which ran through different zoning area. Those various industrial parks and public facilities were connected by the rapid highway system. A multi-core city was formed under the Industry Leading Policy. (Fig. 6)

6. Conclusion:
Kaohsiung has always been a very characteristic city because of the international harbor and various heavy industrial facilities among the city. The advantage of natural geography and the

Fig. 6. Location of the Industrial Areas nowadays.
aggressive urban planning policy under the Japanese colonial government made Kaohsiung a perfect harbor city in Asia. The urban theories applied in Kaohsiung City were mainly taken from Western theories which they adopted from Paris Urban Renewal during the MeiJi Restoration（明治維新）period in the middle of the 19th century. In addition to the political and economic development, the position of Kaohsiung (Ta-Gao 打狗) while a Japanese colony was more than that of a trading port, but also an industrial and military defense city as well. In the structure of Kaohsiung City, an orderly and regular pattern is easily recognizable and has made Kaohsiung the well-rounded industrial city it is today.

Basically Kaohsiung was built through many city mechanisms since the city core was shifted from Cijin offshore bar island(旗津外島) to Hamasan(哈瑪星) in 1912 as an administrative district under Japanese governance. The character of the city was aggressively formed by the authorities throughout history, but the important historical buildings and heritages that remained are mainly official buildings. Local culture and old private dwellings can hardly be found within the city area, but Cijin offshore bar island（旗津外島）, where the early fishing and trading port village arose, still has some. In the evolution of Kaohsiung City, the gigantic and dramatic process of change is an interesting study issue in the field of urban planning. During the evolutionary process, the colonial harbor city was formed and transformed not only based on the theories of urban planning, but also political and economic growth were factors which dominated the whole scope. A city is an organic composition which grows, transforms and decays if certain issues are unveiled. Statistics can never be the only implement for studying urban issues. Phenomenon can be clarified through social and spatial analysis as well, for the cities are alive and are dominated by some uncertain factors of uncertain background.

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