

Study on Historical Urban Texture Restoration and Control Based on "Weaving" Theory

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Abstract

Historical urban texture, the precipitation of history and culture, boasts high historical, cultural and architectural values and hides tremendous economic benefits. This paper fully explained the value and basic theory of historical urban texture, proposed the natural and social attributes of historical urban texture, and classified and summarized historical urban texture, to provide the philosophy and effective methods of urban restoration. Additionally, the "weaving" theory was introduced to put forward the basic principle of historical urban texture control, and the method of element control was used to design the process of "weaving" historical urban texture, finally realizing the organic unity of historical urban texture and economic benefits and giving new life to historical urban texture.

Keywords: Historical urban texture, culture, restoration, weaving, control.

1.INTRODUCTION

With the rapid development of the substance level in today's society, the boundaries of cities are continuously expanded, and the pace of human life is accelerating, leading to the redefinition of the urban functions in all aspects (Ebrahimzadeh et al., 2016). The most obvious manifestation of the redefinition of urban functions is the skyscrapers rising up in the downtown and spacious asphalt roads running through all corners of the city (Al-Ruzouq et al., 2012, Aliabadi et al., 2015). Figure 1 shows the Beijing landmark CCTV headquarters with a considerably eye-catching and brilliant appearance.

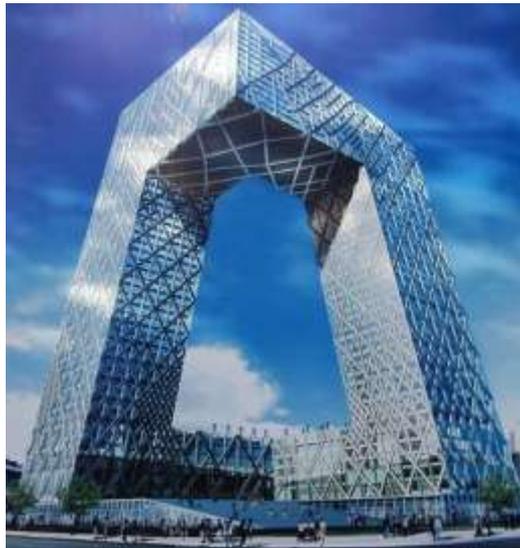


Figure 1. The headquarters of CCTV

However, we have to think over whether such a rapid development fulfills the cultural sustaining for the city itself, whose result is self-evident (Seredych et al., 2009). Taking Beijing's old urban district as an example, in the early days of the founding of the PRC, Mr. Liang Sicheng expressed strong opposition to the dismantling of the old city wall proposed by the Beijing Municipal Government, which did not attract enough attention from

the relevant departments. And starting from this event, Beijing gradually performed large-scale transformation of the old urban area in the context of quick success and development, completely ruining Beijing's historical urban texture (Grewal et al., 2011). Until now, we can still see the integration of the traditional culture and modern architecture in each corner of the old district of Beijing, although the Beijing municipal government has made a certain effort to repair and control historical urban texture (Ebrahimzadeh et al., 2016). As shown in Figure 2, the Beijing municipal government, in order to harmonize the style of the newly-built buildings around Tiananmen Square with the towers of Tiananmen Square, forced the new buildings to adopt the prescribed roof, but the repair and control efforts were not strict enough (Arce et al., 2008), with the awareness of historical urban texture protection not strong enough. Also, the damage human beings once caused to historical urban texture is indeed a scar that can never be recovered. Figure 3 shows the external environment of the National Center for the Performing Arts, which is completely western-style (Takamatsu et al., 2011). However, such a western architecture is located in the center of Beijing old district, calling for our deep thoughts.



Figure 2. Around Tiananmen Square



Figure 3. National Grand Theater

The old city is the precipitation of urban culture under the wheel of history, walking step by step from the millennium to the present. Although it may be dilapidated in appearance, its historical and cultural value cannot be underestimated, nor can its hidden enormous economic benefits be ignored (Daniels et al., 2013). The author believes that we should contain and protect the old city, rather than regard it as a major obstacle to the rapid social development. In the event of a serious crisis of historical urban texture, a correct understanding of historical urban texture is particularly important for the effective restoration and control of historical urban texture (Nakhi et al., 2016).

2. THE BASIC THEORY OF HISTORICAL URBAN TEXTURE

2.1 The Origin and Development of the Historical Urban Texture Concept

“Texture” refers the state that the textural structure of substances present, which is not hard to understand (Cole Kj et al., 2002). To extend this concept to the field of urban space, it means a regional planar relationship, also known as urban texture. And for analysis of the old city, the historical urban texture is used.

The cities are all-encompassing, with the various elements of the city inextricably linked with each other. As an external representation of this relationship, urban texture embodies the intrinsic qualities of the entire city. As the society continues to evolve, the relationship between the various elements within the city will change, and urban texture is the most visible manifestation of this dynamic change (Hagiwara et al., 2016). Therefore, it is of great significance to propose the concept of historical urban texture and make certain analysis and research.

2.2 Characteristics of Historical Urban Texture

Historical urban texture includes two characteristics: progressiveness and one-to-one functional correspondence (Javed et al., 2012).

(1) Progressiveness of Historical Urban Texture

Historical urban texture theoretically is a very abstract theory that aims to intuitively visualize the historical urban texture, with the commonly used means of photography. With the broad photographic scale developing to the refined one, historical urban texture shows a certain degree of progressiveness. Currently, three photographic scale levels of macro-scale, medium-scale and micro-scale are adopted to observe the historical urban texture. Figure 4 shows in turn the photos taken at macro, medium and micro photographic scales.



(a)

(b)



(c)

Figure 4. Microscale

(2) One-to-one Functional Correspondence with Historical Urban Texture

Historical urban texture, as a representation of the relationship among various elements of the city, reflects the derivative changes of urban functions, which to a certain extent, has a certain but not limited to graphical regularity. Historical urban texture is actually a manifestation of urban functions, and corresponds to city functions one by one.

2.3 Attributes of Historical Urban Texture

As the history continues to evolve, historical urban texture finally becomes a symbol of history and culture at that time. Historical urban texture continues to develop, as if it has some kind of life and grows into an existence with distinct characteristics under the influence of various environmental factors. This growth, from another perspective, gives historical urban texture the natural metabolism, which is the first attribute of historical urban texture (Yoo et al., 2008). However, the development of historical urban texture is not purely natural. As it characterizes urban functions, historical urban texture is also affected to some extent by social factors. It changes with mankind's planning on the city, and symbolizes the various social systems and social expression, so historical urban texture has the second attribute of sociality.

3. Restoration of Historical Urban Texture

3.1 Classification in Historical Urban Texture

So far, historical urban texture has faced a tremendous crisis which comes from two aspects, namely the serious damage to the historical urban texture in the past, and the lack of control over the historical urban texture (Taylor et al., 2015). This chapter focuses on how to repair the already damaged historical urban texture. Concerning the historical urban texture itself, it constantly changes with urban development, as a superposition of urban functions in various periods, for which it is extremely complicated. Considering the external observations on historical urban texture, the appearance of historical urban texture cannot be accurately expressed in any photographic scale (Li et al., 2010; Matranga et al., 2014). According to the characteristics of historical urban texture, it is very important to classify and summarize it before the restoration.

This paper argues that the classification of historical urban textures should take courtyard as the basic element, that is, the building is the smallest individual. In the actual work, the photographic observation and the field investigation were used to make a comprehensive evaluation of the performance of all aspects of the building with the courtyard as the basic element, so as to distinguish the historical urban texture with the extremely high historical and artistic cultural value and take it as the center for historical urban texture restoration.

3.2 The Restoration Philosophy of Historical Urban Texture

The precondition for the restoration of the historical urban texture is to pinpoint the expected positioning of the historical urban texture by restoration. The restoration mainly based on the protection of history and culture will certainly sacrifice certain economic benefits, while the restoration aimed at protecting history and culture to a certain degree but maximizing benefits will compromise the historical culture of historical urban texture. In the context of insufficient government intervention and investment, the history and culture protection contradicts with economic benefits greatly. However, from a different perspective, a certain degree of market intervention to achieve a certain degree of economic benefits can in turn provide sufficient capital for the historical urban texture preservation, and enable the ongoing restoration of historical urban texture.

Beijing targeted restoration of South Luogu Lane is a very successful case study of the historical urban texture. South Luogu Lane introduces some market development elements but retains its original alleyways in which various shops with local characteristics have been established. All these shops, thanks to the excellent location and history of South Luogu Lane, have been attracting a large number of tourists, creating tremendous economic benefits. And in turn the businessmen' sense of protecting South Luogu Lane are enhanced. Combined with appropriate intervention by the Beijing Municipal Government, the old city and business complement and boost each other, leading to a well-restored historical urban texture. Up to date, many tourists have been attracted to South Luogu Lane not only because it is a historic alley in Beijing old district, but also because it boasts numerous unique shops and snacks nestled. Figure 5 shows South Luogu Lane's old look, while Figure 6 shows the remodeled South Luogu Lane and a large number of tourists it attracts.



Figure 5. The old South Luogu Lane



Figure 6. The new South Luogu Lane

At the same time, we should correctly understand the gradual development of historical urban texture in the process of restoration of historical urban texture, and should not fix the restoration process within a limited period, which violates the complex evolving process of historical urban texture, both on the history and the development level. In addition, we should fully respect the interiorly imperfect appearance of the old city and some buildings that even look like illegal architectures. Because historical urban texture characterizes the process of urban development, with each part being a derivative of urban development and an integral part of historical urban texture.

In the transformation of the old residential area, there is an important question about the life quality of the residents in the old city, namely, how to enable the old city to meet the growing material needs of residents. The author believes that to meet the residents' material needs is an aspect of the continuous development of urban functions and can be called as the historical urban texture in the meantime. Therefore, on the basis of the protection of historical urban texture, a reasonable improvement and transformation should be made to achieve truly restoration of historical urban texture and give the vitality of the old city.

3.3 Methods of Historical Urban Texture Restoration

For buildings, the smallest unit, the emphasis should be placed on repairing its appearance. Specifically, clear the style of the building, distinguish the construction materials in detail, and repair the various components one by one such as the roof, windows and doors. For example, in the old city of Beijing, most of the gatehouses are wood-made and shall be restored by the same architectural methods as the Forbidden City. However, most of the quadrangle courtyards also in the old district show the masonry structure constructed by bricks. Concerning

the color, the unified color shall be considered in the building restoration, namely whether to paint bricks or whiten the bricks shall follow the established architectural style.

As for the basic element of courtyards, the functional structure should mainly focused on. The courtyard is equivalent to a microcosmic society in ancient Chinese society, in which the social class and functions are fully displayed. Therefore, in the process of restoration of the courtyard, the functional structure should be given top priority. For the residential houses under key protection, the overall restoration should be carried out as far as possible, and the living conditions of residents should be reasonably improved. As for the residential houses under general protection, the illegal construction may theoretically be demolished if necessary and be rebuilt to a certain extent. Additionally, serious old urban dwellings, in order to prevent them from endangering the safety of residents, should be rebuilt as a whole, during which modern technology should be properly used to get harmonized and integrated with the traditional dwellings surrounded around them.

The restoration of neighborhoods is carried out based on the restoration of courtyards. It is necessary to realize the joints of roadways and advocate the pedestrian-based road system that can also bear a certain amount of traffic. The roads in the whole neighborhood should be in harmony with the culture of the courtyards and buildings. Figure 7 shows the road system and courtyards of the Qianmen neighborhood in Beijing, which is a successful case.



Figure 7.BeijingQianmenroadssystem

4. Historical Urban Texture Control Based on “Weaving” Theory

4.1 The “Weaving” Theory

C.Rowe first introduced the urban design concept of "collage" in his book *Collage City*, whose ideas were recognized in the 1970s, and then gradually developed into the theory of urban "weaving". This method can fully connect the divided history with modernity, and solve the space problem to a certain extent, enriching the urban vitality and improving the infrastructure construction.

Since the founding of China, the economic development has been too rapid. Although great economic benefits have been brought about, the system of urban management and investment is not perfect together with insufficient protection of the historical and cultural values contained in historical urban texture. The author believes that the introduction of the "weaving" theory into the control of the historical urban texture in our country is an effective means concerning the development level of our country. We should, taking into consideration the status of the development level of the old city and starting from both economic and social benefits, rationally control the historical urban texture based on the respect for the original cultural features of the old city, so as to achieve a good integration of historical urban texture and its sustainable development.

4.2 The Principle of “Weaving” Historical Urban Texture

The urban development is based on ecological environment, so weaving the restoration of ecological environment is the primary principle of "weaving" historical urban texture. Weaving environment provides

ample natural conditions for the growth of the old city, which is consistent with the above-mentioned nature characteristic of the historical urban texture. In addition, in the process of the transformation of historical urban texture, we should pay attention to coordinating the contradiction between "weaving" and economic benefits, and adjusting the industrial structure so as to accord with the development rules of the old city to the greatest extent. As a microcosm of history and culture, the historical urban texture requires the maximum protection by human beings. In order to strengthen people's protection awareness, the government needs to take necessary interventions to strengthen guidance. Among them, improving the infrastructure of the old city and weaving the public service system are the most effective means. And it is the fundamental for historical urban texture control to strengthen the improvement of the road system in the old city and enhance media promotion and guidance so that the protection of historical urban texture takes root in the human mind.

In addition, the old city as a city has a certain space, and therefore "weaving" process must be coherent to improve as a whole. And on this basis, "weave" social class to make it a complete stand-alone system, rather than an experimental field requiring the continuous interference by the government. In the process of transformation, attention should be paid to classification and induction. For different types of urban lands of different importance, we propose a targeted "weaving" strategy to achieve harmony and unity of interests in all aspects based on the effective control of historical urban texture, to grant new vitality to the old city.

4.3 Historical Urban Texture "Weaving" Process

Observe and classify the historical urban texture, and count and further classify internal buildings. For example, conduct classification in line with the roof style, then divide the historical urban texture as lands and architectures, and finally design differentiated plans for each monomer according to the classification. This paper adopted the elements control implementation method to "weave" the historical urban texture. In order to realize the effective control of urban texture, it is necessary to control different control elements to different degrees. The common control methods are: index fixation, provision quantification, urban design standardization, etc.

(1) Index Fixation

Indicators here refer to the parts that need to be controlled in the historical urban texture. The index fixation can ensure the effective implementation of the urban texture control system, with the common indexes being the volume rate and the green land rate. The volume rate refers to the extent of land development, whose control should be implemented in line with conditions of different regions, combined with the urban development design. Figure 8 shows the recommended volume rate of different architectural forms, which should be strictly conformed in the historical urban texture control.



Villa Townhouses 6floorsbelow 7-11 floors 12-18floors 19 floors above

Figure 8.Suggested values for the different architectural form of volumerate

(2) Provision Quantification

Besides the quantitative control mentioned above, the qualitative control should be carried out, in which the provision quantification is an important means to control the historical texture. The provisions include not only

the initial urban transformation design, but also control policies introduced by the government. The government's policies do not directly guide but do supervise the actual work. Therefore, we should fully understand the local policies in historical urban texture control to enhance the feasibility of the plan. The formation factors of the historical urban texture are shown in Table 1:

Table 1. Factors Forming space of the old city texture

Urban Spatial texture scale level	The overall spatial form of the Old City	Open space elements of the Old City	General construction style and control elements of the City
City-level urban spatial texture	Road net and land block	Axis, surface texture and wall	Building height zoning, Construction density zoning and Plot Ratio

Considering the control elements above, the historical urban texture control system is summarized as Figure 9. Each control element of the historical urban texture presented in Figure 9 shall be combined with the old city management to enhance the system's operability. It is obvious that the reasonable control over the control elements is the key to strengthen the historical urban texture control and old city management, and plays an indispensable role. In order to rationally control the historical urban texture and realize the effective management of the old city, the following two ways shall be implemented to integrate the historical urban texture control system into the old city management system.

(1) Effective Combination with Provisions

That is the provision quantification mentioned above. It is necessary to make clear the local provisions, which is a guarantee for the historical urban texture control. It is possible to save the cost to the maximum extent by making reasonable plans according to the provisions and defining the control elements. At the same time, provisions have supervision function after the historical urban texture control projects finish. The design and implementation strictly in accordance with the provisions to enable the protection of projects by provisions can also promise operability.

(2) Effective Combination with Technology

In the early stage of the design of the historical urban texture control, it must be clear whether the technical means are available and applicable, and meet the technical management regulations. In this regard, the regulations throughout the country are not the same, but play a vital role in the control of the historical urban texture. Therefore, it is particularly important to check whether the historical urban texture control has been effectively combined with technology.

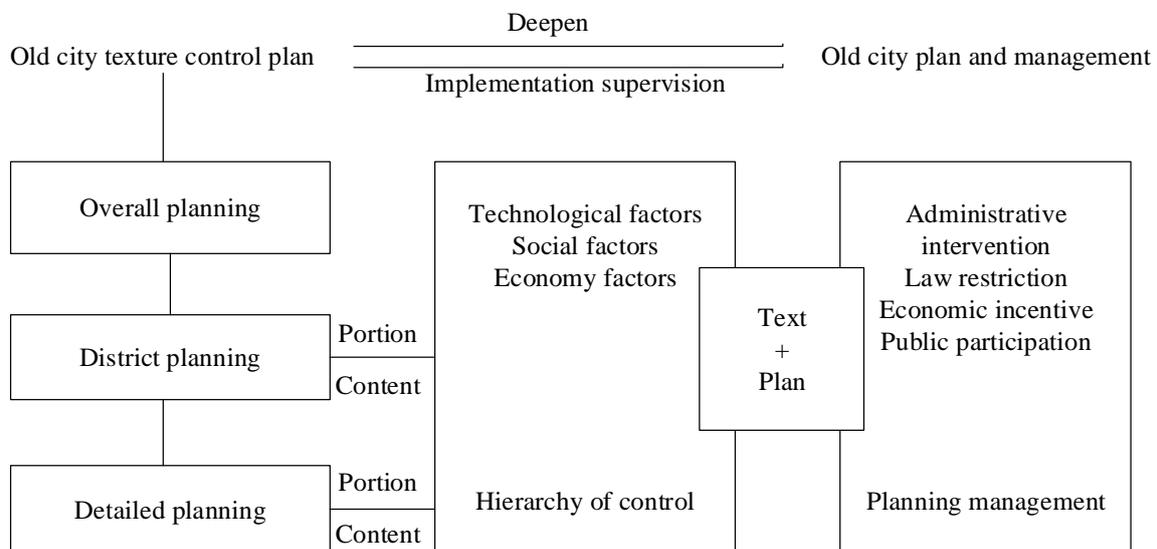


Figure 9. Texture control system of the Old City

5. CONCLUSION

In this paper, we put forward the "weaving" theory based historical urban texture control and restoration, with the specific conclusions as follows:

- (1) Historical urban texture, the historic and cultural precipitation, boasts extremely high historic and cultural values and architecture arts, and hides huge economic benefits, so the effective rehabilitation and control of historical urban texture is very important.
- (2) Historical urban texture has the attributes of nature and sociality. In the process of restoration and control, its attributes shall be followed to realize the organic unity of protecting the historical urban texture and fulfilling economic benefits.
- (3) The restoration of the historical urban texture should consider the restoration methods one by one targeted at different objects with the courtyard as the most basic element and the building as the monomer. In the neighborhood restoration, we should take special consideration of the road system to realize the roadway joints.
- (4) The "weaving" theory provides a new way to historical urban texture control. On the foundation of meeting the "weaving" principle, the indices are quantified for an effective analysis the relationship between the historical city control system and the planning system to well control and bring new life to the historical urban texture.

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