CO-CREATE WITH RESIDENTS: PARTICIPATORY ACTION RESEARCH APPROACH IN SURFACE DECORATION OF OLD BUILDINGS

By

Mr. Xian LI

A Thesis Submitted in Partial Fulfillment of the Requirements

for Doctor of Philosophy DESIGN ARTS (INTERNATIONAL PROGRAM)

Graduate School, Silpakorn University

Academic Year 2020

มหาวิทยาลัยศิลปากร

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Mr.XIAN LI

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิต

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Title	Co-create with Residents: Participatory Action Research Approach in Surface Decoration of Old Buildings
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MR. XIAN LI : CO-CREATE WITH RESIDENTS: PARTICIPATORY ACTION RESEARCH APPROACH IN SURFACE DECORATION OF OLD BUILDINGS THESIS ADVISOR : PROFESSOR EAKACHAT JONEURAIRATANA

In the process of old building regeneration, designers prefer to rebuild (redevelopment) and residents prefer to repair (rehabilitation). Residents spontaneously repair the facade of the old buildings, destroying the city's aesthetics. This study aims to establish a co-creation method with residents in surface decoration of the old buildings. Specifically, the co-create with residents focuses on the art intervention in decoration. In this context, the co-creation with residents is defined as the decoration and beautification of the surface of old buildings with the assistance of designers through the expression of contemporary art.

To test the hypothesis that application of art intervention in building surface decoration, three workshops were carried out according to the action research. To select art form to realize co-creation, obtaining the expression of collage art; to develop art transform into a decoration for co-creation, obtaining the abstract expression to realize the transformation from art to design symbol; and to evaluate co-creation method with residents, obtaining the principles and methods of organization co-creation. The results showed co-create with residents requires the following three improvements: simplify the method; entertainment process; expand the depth.

These results suggest that providing different levels of residents' co-creation, including design to residents, design from residents and local art for co-creation. On this basis, the concept of co-creation has been expanded to involve residents, designers and artists in "Participatory" with art, architectural technology and city culture in "Action Research".

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Presenting this thesis would not have been possible without the help of friends. Since I couldn't back to China due to the COVID-19, they helped me coordinate the residents' workshops and interview records. At the same time thank my family for their support and encouragement.

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Xian LI

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Chapter 1 Introduction

1.1 Background of the Research

In the past 100 years, the city has experienced earth-shattering changes, especially from the beginning of modern architecture. With the innovation of construction science and technology and building structure, efficient building construction mode makes the world cities tend to the same city appearance. Le Corbusier said that “A House is a Machine for Living In” (Corbusier, 2013), a large number of modern buildings accommodate more people, and the level of global urbanization has developed by leaps and bounds in the recent 100 years. The city has been expanding, new buildings have been increasing, and the old buildings cannot meet people’s higher and higher living needs. With the development of science and technology, the renewal cycle of architecture is becoming shorter. However, the complexity of the city itself makes new buildings unable to completely replace the old buildings. A new city concept like Utopia, stress the reality that the old and the new buildings will coexist in the city for a long time.

More and more urban planners and architects realize that the renewal of old buildings is a necessary method for urban development. The transformation of old industrial areas, the elevation of urban buildings, and the micro renovation of urban blocks are all hot topics. However, in the process of urban renewal, architects generally adopt the conventional design methods of architectural design, such as site analysis, typology, and morphology. To achieve the so-called visual coordination, they use traditional architectural symbols for facade decoration. In the design process, they ignore the difference between the old building renewal and the new building design, and there is no difference between the old building type and the old building type. What’s more important is that the stakeholders of the old buildings are the residents who live in them. The first requirement of the residents for the reconstruction of the old buildings is the improvement of the function, and the second is the beautification of the appearance. However, it is easy to ignore the needs of the transformation willingness, construction period, noise pollution, and self-participation. On the other hand, the residents’ spontaneous transformation is

also affecting urban appearance. According to their own needs for building functions, residents repair the old buildings, by using low-cost building materials and recycling garbage, without considering the aesthetic feeling in the construction. For the city, it destroys the original appearance of the block, and some materials are built randomly and easily become a potential safety hazard.

The first is the residents' repair of the old building surface, which is an economical and flexible way. However, this method lacks an overall consideration, thus can destroy the original style of the city. The second is the designers rebuild of the whole or part of the building surface, which has a good aesthetic result overall, but it does not consider the spontaneous adjustment in the later period of the residents and contain limited flexibility. Based on the above, this study aims to establish a model of co-creation in which residents are the main body. The designer assists the residents to complete the decoration and beautification of the old building surface, and uses art intervention to make the reconstructed building surface realize the advantages of economy, flexibility, integrity and later renewal, and can represent the aesthetic characteristics of the city. (Figure 1)

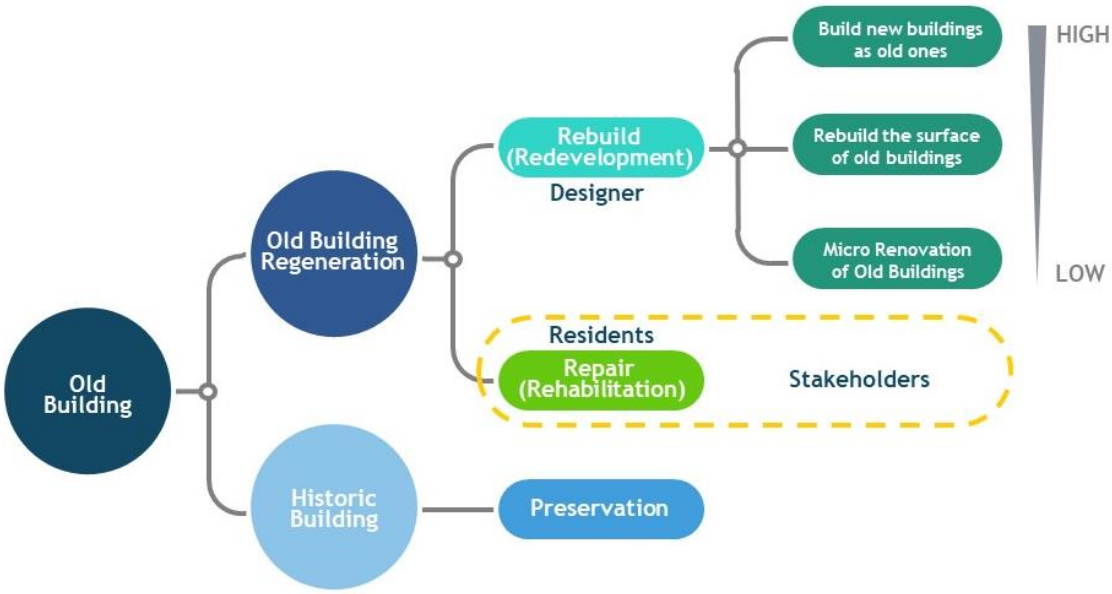

Figure 1. Research Background

1.2 Significance of the Problem

In the existing research, there is a lot of facade reconstruction of urban old buildings, which can be summarized as follows: first, the reuse of public buildings,

mainly the surface reconstruction of abandoned industrial buildings; second, the facade reconstruction of urban buildings, mainly focusing on the application of design methods and building materials; third, the micro renovation of urban blocks, mainly focusing on the inheritance and protection of urban context.

The transformation and activation of public buildings are more similar to the design of a new building. The stakeholders are developers, with commercial development as the main purpose. After the completion of the building renovation, only the old urban buildings are taken as the design memory point to retain the imprint of urban history and context. Urban facade reconstruction is more to explore the application of design methods and building materials. In the general rules of existing architectural design, the historical context of old buildings is taken as the design elements, and the historical symbols are taken as the reference of architectural form changes and architectural style standards in the design process, without considering that residents are the stakeholders of architectural transformation in the process of old building renovation demand is the main body of the design. In the process of urban micro renovation, the design idea has been changed from large demolition and large-scale construction to local repair and renewal. However, the level of this transformation mode is difficult, the residents lack participation in the transformation, and the completion effect cannot be coordinated as a whole. (Figure 1)

Residents are the main stakeholders in the reconstruction of old buildings. From the level of participation in participatory action research, this is only the primary stage of informing, informing gathering and consultation (McIntyre, 2007). Residents should be allowed to participate in all stages of the design process, and ultimately achieve the highest goal of independent regeneration of old buildings, which echoes with the spontaneous repair of residents' destruction of urban aesthetic feeling. At present, the research on Residents' participatory design mainly focuses on the optimization design of the public environment of the community-based blocks, and the building facade beautification, which is most related to the residents' self living, has not become the main field of participatory design. Community participatory action research is originally a kind of action research mode

from bottom to top. It is not in line with this interest to beautify the individual links of residents by improving the whole community links. Based on residents' participation in their own house renovation activities, the practice research mode from part to whole is more in line with the goal of participatory action research.

Therefore, the significance of the study is to establish a co-creation model with residents as the core can decorate and beautify the old building surface, so as to achieve the purpose of the street and building regeneration. Designers cooperate with residents to participate in the judgment, selection and production of the design in each stage of the co-creation, and after the completion of the design project, they can also independently update the decoration of the reconstructed building surface. (Figure 2)

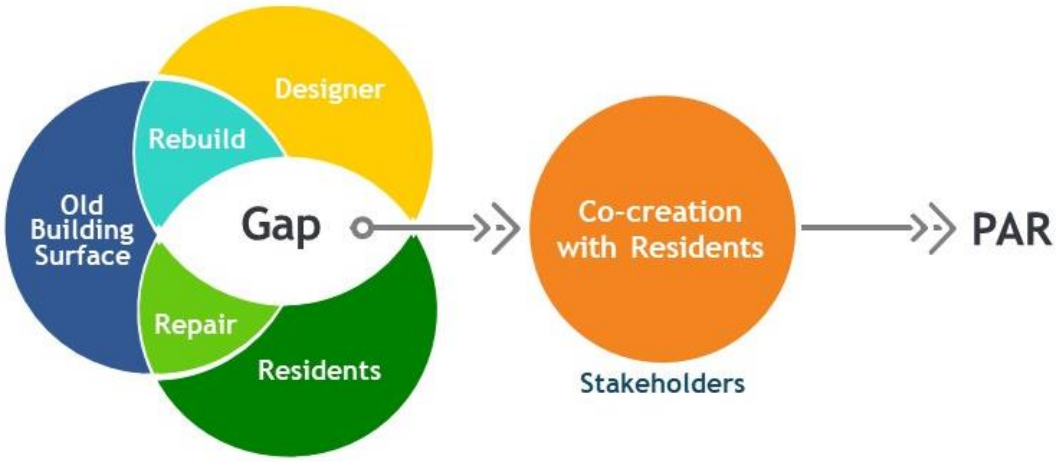

Figure 2. Research Gap

1.3 Hypothesis

Given the current problems in the process of urban building regeneration, there is a gap between self-repair and participatory design. The study puts forward the co-creation of architectural surface decoration through art intervention. As a method to guide residents' co-creation, art intervention has three meanings. First, residents repair the building surface spontaneously, which destroys the original texture of urban architecture on the one hand, and shows the interesting phenomenon of post-modern form on the other hand. Second, the historical law of architectural development determines that the future development direction is the online expression of human emotion on the architectural surface, and art as an

online expression of emotion can be realized. Third, from the architectural theory, art as a means of building facade decoration has always existed, the change of the times makes the building facade need new art forms.

At present, art intervention in public spaces and cross-border co-creation between artists and designers have become the trend of design development. This study puts forward the hypothesis of art intervention mode as a means of co-creation with residents. From a historical point of view, the hypothesis is verified to identify the development law, especially the patterns and changes since the development of post-modern architecture. This identification can serve as a theoretical basis for the subsequent stage of art workshop as a method of design element composition. The surface of post-modern architecture undergoes a cycle mode, that is, from reappearance to non-reappearance and then from non-reappearance to reappearance (Feng, 2008; Zhao, 2005). The first reappearance is the restoration of the historical style; the first non-reappearance is the high-tech architecture, which is the pursuit of science and technology; the second is reformism, which is the reproduction of traditional materials; the second non-reproduction is parametric architecture, which is the pursuit of artificial intelligence. The third reappearance is the trace of emotion and the expression of art intervention mode in architectural design. It defines the method of art intervention in the design in the process of old urban building renovation. Innovation is no longer the creation of machines to replace people's repeated labour, but the transmission of people's thinking and emotions through the creation of things (Somers, 2019).

In architectural theory, from the Art Nouveau to the De Stijl movement, the expression of artistic style on the architectural facade is never a new method. From the phenomenon analysis, the behavior of self-initiated building repair is full of post-modern art forms. The repeated stacking of living materials used by residents is similar to the installation art and concept art in postmodern art. Collage, simplification and moving of elements are commonly used in postmodern art (Bertens & Fokkema, 1997). Fredric Jameson, an American philosopher, believes that the conditions of life and production will be reflected in all activities, including the creation of art (Jameson, 1991). French philosopher Jean Baudrillard pointed out that

as a Post-modern Concept, super-reality is not a betrayal of reality, but a more real super-reality than reality (Baudrillard, 1983).

1.4 The Objectives and Questions

Residents spontaneously repair the facade of the old buildings, destroying the city aesthetics. the hypothesis of using art intervention for co-creation to solve the problem. Specifically, co-creation can express the characteristics of urban aesthetics by means of artistic intervention. Aiming at answering the research problem, the following research objectives are established:

1). To analyze co-creation in the surface decoration of old buildings.

2). To create co-creation method to realize the art intervention in the old building surface decoration.

3). To test the co-creation method in Chongqing Xiahao Street.

The first goal is to define the concept, which needs to answer how to realize co-creation in the surface decoration of old buildings. The second goal is the core of the research, which needs to answer what art form is used to realize co-creation; how to transform art into decoration for co-creation; how to organize co-creation with residents. The third goal is to evaluate and verify, which needs to answer how to apply co-creation in Chongqing Xiaohao street. (Figure 3)

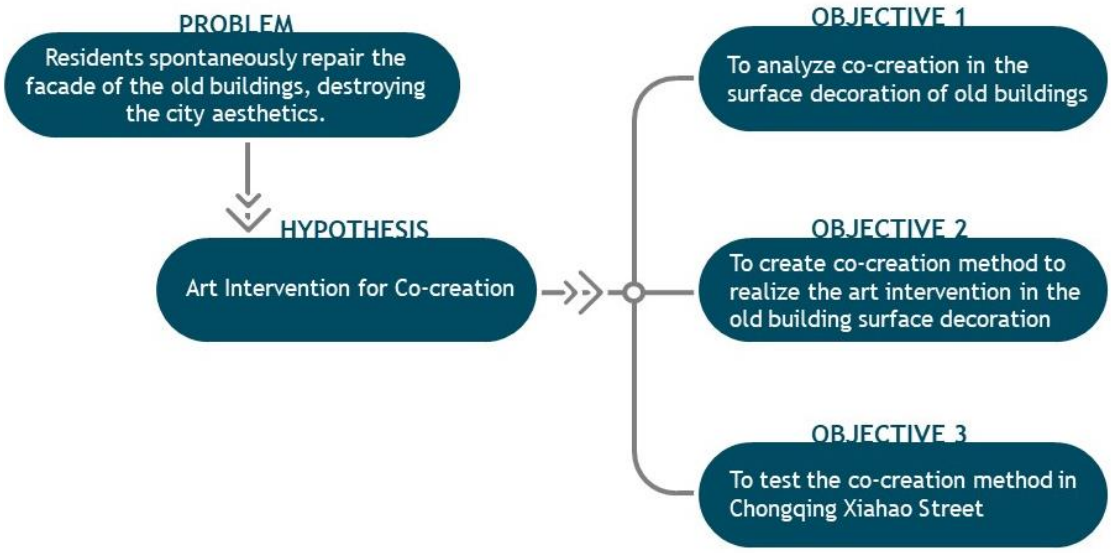

Figure 3. Inferential Process of Research Objectives

1.5 The Scope of the Study

The core goal of the research is to achieve the decoration of the old building skin by co-creation, which includes three aspects. The first is that the participants are residents. Second, the research field is the decoration of old building surfaces. The third is the method of co-creation, using art intervention.

The main body of the research is the residents, and the co-creation is carried out around the residents, and different strategies are adopted in different stages of the cooperative process. As an important role in assisting residents to complete co-creation, designers need to assist from both macro and micro aspects. In the macro aspect, the methods and principles of organization co-creation are formulated, and in the micro aspect, the materials and patterns implemented by residents are refined.

The decoration of old building surfaces is the subject of study. The building facade is currently the most common method of urban regeneration. The separation of the building surface, which is also the theoretical basis for the reconstruction of old buildings from surfaces, is discussed, as is the process of building independence from the whole to the facade. Modern structural structures are robust in urban building facade reconstruction, and building surfaces are independent and obey the building modulo theory. The development history of post-modern architecture suggests that a reflection of emotion would be a feature of the future architectural surface, providing theoretical guidelines for resolving the problem of co-creation with residents.

Art intervention is the process. The post-modern art spirit of residents' spontaneous repairs is observed as a result of the phenomenon, and the historical importance of art as architectural surface decoration is verified. Art interference is proposed as the primary tool for realizing co-creation. From contemporary art to the old building surface decoration implementation process, all revolves around this method of seeking the reality. (Figure 4)

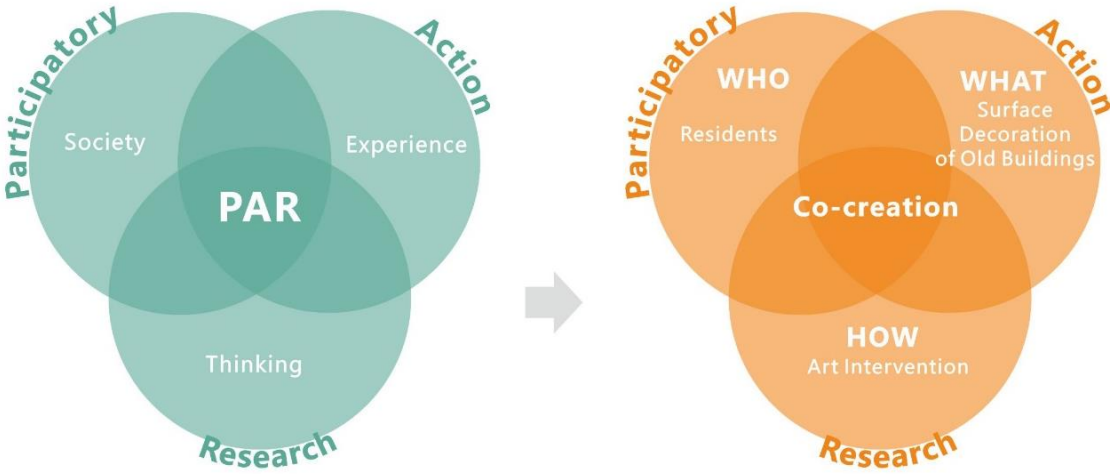

Figure 4. Scope of the Research

1.6 Overview

The first chapter starts from the problems, analyzes the phenomenon and problems encountered in the current urban development, aiming at the phenomenon that the residents' spontaneous transformation of old buildings destroys the urban context, and the advantages and disadvantages from this phenomenon. This paper puts forward the hypothesis of solving the problem, adopts the way of collaborative design, lets the designer participate in the residents' self-transformation of the old buildings, and develops its internal post-modern art form. This paper puts forward the assumption that the transformation and renewal of old buildings by residents' cooperative design can be realized using art intervention. This paper puts forward three research objectives, and puts forward the research problems to achieve the objectives.

The second chapter defines the core concepts of participatory behavior research, collaborative design, old buildings, building facades, building skin, building skin decoration, post-modern performance on the building skin. Participatory behavior research is the research method of this paper. From the concept, scope and paradigm, this paper expounds the reason and significance of adopting participatory behavior research as the research method. Collaborative design is the core of the paper. From its concept and method, the subject of collaborative design is defined as residents. The literature of old buildings and building skin defines the

scope of research as the skin of old buildings. The concept of building facade decoration and post-modern defines that the way of transformation is to use post-modern artistic techniques to decorate the building surface in a non-permanent way. Finally, the theoretical framework is formed.

The third chapter takes participatory action research (PAR) as the methodology and uses its theoretical model to carry out the research. The core includes three parts: participation, action and research. Participation is mainly in chapters 1 and 2. It is set that the core of participation is residents and the method is cooperative design. Action is mainly the third and fourth chapters, to solve how to make art involved in the cooperative design for the old building skin decoration. The validity of the results is verified in chapter 5, and the conclusion is obtained in chapter 6.

The fourth chapter takes the workshop as the implementation method of participatory behavior research. The three workshops are carried out in four steps: planning, implementation, feedback and deepening. The goal of the Bangkok workshop is to select art form for co-creation, and the result is collage as an art intervention method; The goal of Florence workshop is to transform art into design elements, and the result is to get the method of collage art abstracting into design symbols; The goal of the Chongqing workshop is to organize residents to co-creation, and the result is to get the principle of cooperative design. Finally, all the findings and results are summarized.

In the fifth chapter, the results of the cooperative design are verified by the design of Chongqing xiahao old street, including site analysis, building surface structure design and cooperative design. Among them, modular technology is used in the design of building surface structures to create a single form of skin module, which makes it easier to realize the later cooperative design. Co-creation takes residents as the core, including different methods of residents' co-creation in different stages of the early and late design. Finally, local art is used as a means of expression of post-modern art, which makes art intervention become local art.

The sixth chapter is the summary, which restates the research objectives, problems and results. And from the local art as a form of postmodern art expression,

it is concluded that artists participate in co-creation and urban culture in co-creation, which expands the breadth and depth of co-creation and obtains the contribution of research.

Chapter 2 Literature Review

Based on the keywords, the paper defines participatory action research, co-creation, old building surface, facade decoration and art intervention. Participatory action research is the methodology of the study, which serves as the theoretical basis for guiding the framework of the study. Co-creation defines that the core object of participatory design is residents, as well as the current gap of participatory design. The definition of the old building, building surface and other concepts explain the necessity of building surface as transformation and renewal. The definition of facade decoration and art intervention theoretically verifies the hypothesis that art is used as architectural surface decoration. Finally, taking Chongqing as a case, the study analyzes the types and the classification of old buildings in the current urban old block reconstruction.

2.1 From Participatory Action Research to Co-creation

Participatory action research is the methodology and co-creation is the method. The research system consists of three aspects of participatory action research, especially the cooperative design with residents as the core. The four steps of a participatory cycle are the main method to guide cooperation. The purpose is to enhance the participation of residents as stakeholders, and reflect the principle of the participatory action research method.

2.1.1 Participatory Action Research (PAR)

Participatory action research (PAR) is a research approach in social psychology, which belongs to action research. Action research was proposed by Kurt Zadek Lewin, a German American psychologist in the 1940s. It mainly studies the influence of some actions on the organizational system. He proposed that quasi-experimental research should be carried out on the change process in real life, to deepen the understanding of the dynamic change process of social events. He advocated that community workers should be assisted through field research to study their problems with scientific methods, to correct their actions and decisions. Action research is different from the scientific method of purely studying objective laws. In the process of action research, researchers and research objects participate

in the formulation and implementation of solutions at the same time, which has obvious democracy. At present, action research has become the preferred method of on-site real-time research. Action research focuses on solving practical problems, so it will develop into many different types according to different situations (Lewin, K, 1946):

1). Diagnostic action research: it refers to one of the simple and typical problem-solving strategies for practitioners in the face of work difficulties.

2). Participant action research: during the research process, provide opportunities and positions for the person concerned to assist them to participate in the research process, and finally work together to achieve good results.

3). Empirical action research: it is a research method to provide some specific actions for the problem, and make a correct record of the researcher's actions and any changes in the situation.

4). Experimental action research: the only research form similar to the laboratory, which can solve practical problems in the actual situation.

Action research pays more attention to problem-solving than problem investigation, while participatory action research emphasizes more direct collaborative participation among people (Reason & Bradbury, 2008). Therefore, PAR is a community research method that emphasizes participation and action and solves the problem of co-researchers. The research objectives of PAR come from the practical problems that will be directly affected by the solution of the problem, which can also be called the problems related to the interests of the community. Such research projects are usually situational, and the resources that PAR thinks can solve such problems are usually from within the community. In this sense, PAR is a methodological proposal, which is an alternative to the classical method to solve social problems. Action research has always been concerned with mobilizing the social sectors of ethnic minorities so that all aspects of knowledge can be used in the interests of the community. PAR can be regarded as a guiding paradigm to influence and democratize knowledge creation, and based on the actual community needs, it can overcome conventional education and elitism and obtain the most extensive benefits (Lewin, K, 1946).

At all stages of the research project, PAR maintains contact with all members of the diagnosed organization, emphasizing that all activities of the organization must meet the needs of its transition, such as improving interpersonal relationships among employees at all levels, fostering people's awareness of the importance of the organizational change, and so on. Therefore, the researchers should take certain measures so that all the personnel of the organization participate in the change. PAR is not entirely a problem-solving diagnostic work, it should also be strictly scientific observation and control of action, so that we can find some rules or laws that play a decisive role in the study of the nature of the phenomenon through research. The theoretical and methodological basis of par is as follows (Alexander et al., 2007):

1). Redefine the role of the specified shared action domain. Community members are not only recipients, recipients or beneficiaries, but also producers of knowledge. Different types of knowledge can work together through them. Interveners are no longer experts, but promoters or promoters in the process of research intervention. Therefore, it tries to get rid of the distinction between knowledge subject and knowledge object and understand knowledge as the product of various experiences.

2). Political level. The way of participation seeks knowledge for the transformation of power relations and changes the rule of persistent social inequality. This is in contrast to the traditional interventions that enable people to adapt to the social structure.

3). Challenges in the assessment process. Assessing challenges and difficulties and solving strategies does not automatically achieve inclusiveness for all, nor is it always the common aspiration of all. Similarly, not all the problems raised by the actors are always the key knowledge, and the solutions to this knowledge are based on the background, needs and expectations of the participants.

PAR is the integration of three basic contents: Participatory, that is, paying attention to social and democratic life; Action is the practice of combining history with experience; Research is the accumulation of knowledge in the process. However, the combination and focus of PAR are not the same, and the emphasis on each part

is also different. This means that PAR is not the whole of ideas and methods, but the diversified direction of knowledge creation and social change. In the study, residents are the main participants, and designers and other stakeholders are the assistance of residents (Chevalier & Buckles, 2019). In the design process, residents participate in all stages of the design process, and present in different ways. Residents can judge, select, make and update products at different stages of the design process, so as to achieve the core interests of stakeholders. (Figure 5)

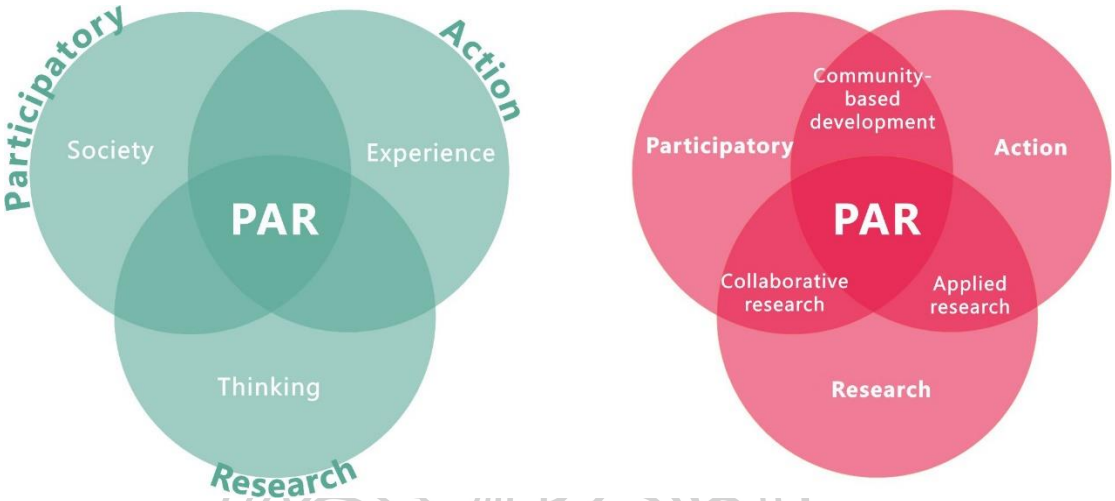

Figure 5. Participatory Action Research

The process of residents' participation can be divided into three types according to the level of democracy: participatory top-down approach; professional-guided participatory approach; endogenous bottom-up approach (Inoue, 1998). According to the classification of participation behavior, these three types can be divided into six types: 1). Informing; 2). Informing gathering; 3). Consultation; 4). Conciliation; 5). Partnership; 6). Self-mobilization (Inoue, 2004). Informing is provided, which is generally provided and decided by the project leader directly without participation in the activities. Informing gathering is a process in which the project leader collects information and decides on it, and includes very limited participation activities. Consultation is two-way communication between the project leader and the community, and the decision is made by the project leader, including very limited participation activities. Conciliation is the community participation in decision-making, but the project leader has the main decision-making power, and participation

can affect the final decision. Partnership is an equal relationship between the community and the person in charge. The community participates in all activities and decision-making processes and shares responsibilities. Self-mobilization is that the community action plans and implements the project, and the project leader is only the organizer of the activity. (Figure 6)

Figure 6. Levels of Participation

2.1.2 Participatory Design and Co-creation

Participatory design (PD) is a design strategy that involves users in the core design process. It is also known as “co-design” or “cooperative design”. It entails techniques that are successful not only during the project’s initial exploration process, but also during the subsequent conception phase, encouraging end-users of goods, facilities, or experiences to participate positively in both phases for the solutions they co-design. Understanding how people deal with problems allows you to see the opportunities in their lives. This new data will help articulate how designers can mine design points and user suggestions for effective and actionable inspiration while creating solutions. PD is a design method that encourages all relevant people (such as users, managers, collaborators, residents, and consumers) to engage in the design process so that their needs can be better understood, addressed, and recognized. We will produce more creative and user-centered outcomes if we step away from the concept of designing for them and start engaging them and designing together, whether we are designing for clients, staff, service providers, or other users.

Co-creation is a design approach that involves stakeholders actively in the design process to ensure that the results meet their needs and usability. Its core idea is to integrate users into the design process more deeply. The relationship between designers and users has changed. Users have become the designers of products, and designers have become the organizers who coordinate design and cooperate with the completion of the design. Designers are not the end-users of products (Schuler & Namioka, 2009). The completion of products will involve cultural, political or psychological factors of different users. Co-creation allows users to participate in the design. Users can use various tools to describe the products they want, to understand the needs of users at more levels.

It can be found that participatory design aims to achieve the final requirements, and its core is the designer and decision-maker. Participants are complementary to optimize and improve the design process and structure, and cannot change the core of the design, and can not reflect the real stakeholders. At present, participatory design mode has been applied in the process of urban planning, architectural design and community design. Especially in the transformation of old communities, the upgrading of physical environment and the construction of public culture are inseparable from the participation of the original residents (Yamazaki, 2017, 2019). In a narrow sense, the participatory design method is used to collect residents' opinions and materials. These materials can help the design team grasp the real community information and user needs. In a broad sense, participatory design as a catalytic medium of the design process, residents design together to create a unique local public environment and create a sustainable community space (Plattner, Meine, & Leifer, 2012). This study is more inclined to co-creation, setting goals based on the core interests of stakeholders. Two or more design subjects, through a certain mechanism of information exchange or mutual collaboration, complete this design goal with different design tasks. Co-creation must involve the close combination of human, data and system. In participatory design, non professional participants are not familiar with the design tools and techniques, which makes it difficult for them to participate in the process quickly in a short period of time, resulting in resistance and rejection of participatory design. The main body of

co-creation is the residents. The design method and process are based on the residents. The designer caters to the needs of the residents through the design method to complete the design project. In practice, the dimension of professional knowledge is reduced, and the design process is presented by contacting model and object. At the same time, create flexible participation in the design process, so that residents can complete the co-creation in the entertainment (Blanco-M, 2020; Windasari & Visita, 2019). (Figure 7)

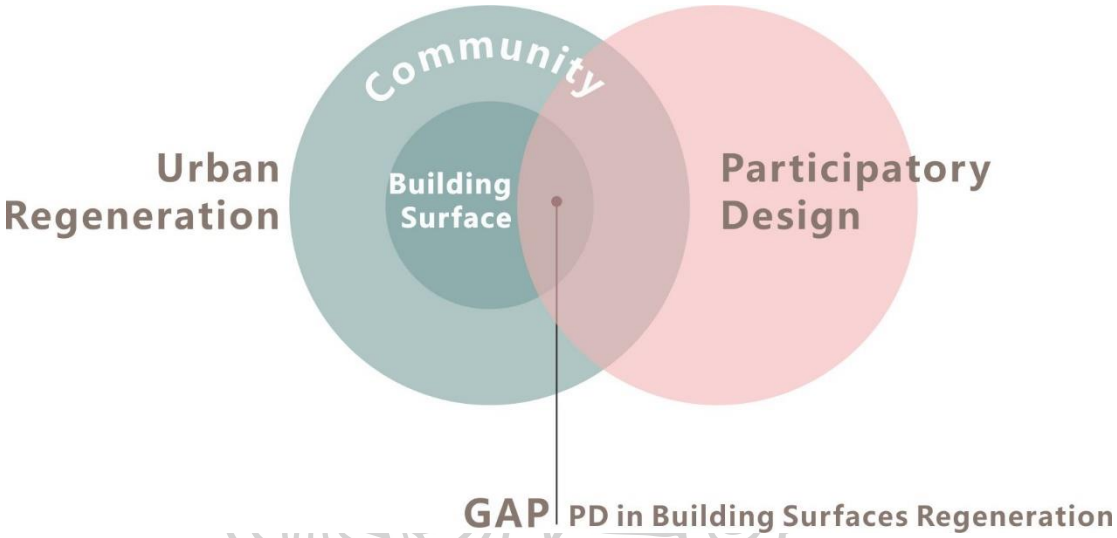

Figure 7. Gap of Participatory Design in Urban Regeneration

2.2 Definition of Old Buildings

The city is a contradictory complex (Venturi, 1966). On the one side, the city strives to maintain its traditional and regional characteristics, which set it apart from other cities. On the other side, the city must grow towards a similar style homogeneity under the influence of globalization (Almusaed & Almssad, 2019). As a result, architects and urban designers have always had to strike a balance between the old, the historic, and the new in urban architecture while retaining architectural style and characteristics (Ellin, 2013).

2.2.1 Historic buildings

Historic buildings are the cultural heritage of mankind, which can reflect the culture and history of the region. Therefore, it covers a wide range of cultural relics and historic buildings, as well as industrial heritage and intangible cultural

heritage. The types of buildings are not only ancient buildings but also modern buildings and blocks within the limited scope (Highfield, 2003). Because of the unique positioning of historic buildings, buildings cannot be transformed and changed in the renewal of urban blocks. Some historic buildings are in disrepair for a long time, so they can only be restored in the same way. The scope of historic buildings is very wide. If the same method is adopted in the restoration process, it is not significant enough for some historic buildings with little historic value. Due to the lack of funds and low historic value, these kinds of historic buildings are often in an awkward situation, and the buildings are often abandoned. According to the theory of architectural metabolism, urban architecture can grow and die out. The natural aging of old buildings must be repaired and renewed. This renewal method should not only be repeated copied. Of course, this renewal method will be stricter for historic buildings. How to retain the style characteristics of historic buildings, how not to damage the cultural context of historic buildings, and how to endow them with the historic buildings, new urban culture, how to make historic buildings activate city blocks, and so on. The building's surface is the external enclosure of the building, which will not affect the building structure. Temporary attachments are arranged in the building surface to find the overlap of urban culture and historic buildings.

The Venice Charter of 1964 established the definition of historic buildings. The Venice Charter for the Protection and Restoration of Monuments and Sites is a collection of guidelines established in 1964 by a group of conservation professionals in Venice that establishes an international framework for the conservation and restoration of historic structures. The Charter lays out the concept of historic buildings as well as the standards that should be followed when restoring them. The restoration of historical structures must be done using original materials and authentic documents, as mentioned in Article 1 and Article 9 of the Charter, respectively.

> Article 1. The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a particular civilization, a significant

development, or a historic event. This applies not only to great works of art but also to more modest works of the past, which have acquired cultural significance with time. (ICOMOS, 1965)

Article 2. The conservation and restoration of monuments must have recourse to all the sciences and techniques, which can contribute to the study and safeguarding of the architectural heritage. (ICOMOS, 1965)

In 1979, Burra charter proposed for the first time the renovation and utilization of historical buildings and the prepayment of new functions and uses of historical buildings. The Burra Charter defines the basic principles and procedures to be followed in the conservation of Australian heritage places.

Preservation means maintaining a place in its existing state and retarding deterioration. It is recognized that all places and their elements change over time at varying rates. (ICOMOS, 2013)

Restoration means returning a place to a known earlier state by removing accretions or by reassembling existing elements without the introduction of new material. (ICOMOS, 2013)

Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material. (ICOMOS, 2013)

The protection, maintenance, and reuse of historical buildings are controlled in the transformation without damaging the original architectural cultural environment. historical buildings have always maintained the principle of repairing the old as the old, deliberately restoring the original historical traces. The reuse of historical buildings, especially the reuse of industrial historical buildings, has become the mainstream of urban historical buildings renewal. A large number of industrial buildings such as factories and warehouses have been transformed into modern commercial space. This cannot only preserve the cultural history of the city but also reduce the waste of resources. However, this way of reconstruction and restoration

will make the urban blocks present a homogenization phenomenon. Limited to the transformation of internal space, retaining the original state of the building surface may be a way to preserve the characteristics of urban areas, and appropriate reconstruction of the external surface of the building is a new method to create.

The reconstruction and renewal of building facades is the main method of urban renewal and development, but it is mainly used in urban old buildings. The facade of historical buildings is a restorative transformation to restore the appearance of historical buildings before. The facade reconstruction of old buildings is a process of redesigning the original building facade through composition, proportion, material, form, and other aspects. There are usually two ways: the first is the method of comparison, which shows the separation of the new construction and the original building, and strengthens the texture and characteristics of the times of the original building; the second is a similar method, which shows the integration of the new construction and the original building, and creates the reappearance of the historical style.

In the elevation renewal of historical buildings, the principle of similarity is generally used, and high regulated materials are used to achieve complete restoration of historical features. The principle of contrast is usually easy to have a destructive impact on historical buildings, which may damage the original style and features, or psychological differences between the original buildings.

2.2.2 Old Buildings

Building new to old is a natural phase of urban metabolism, and urban regeneration is objective science (Waste, n.d.). Due to capital and technological constraints, old buildings are unable to meet the needs of new cities in the midst of rapid urban growth. In urban areas, old and new buildings coexist, and they will continue to do so for a long time (Rowe, 1984). More and more architects are concentrating their efforts on low-cost urban renewal and micro-transformation projects (Broudehoux, 1994). However, what are the city's old buildings, what are the city's new building needs, and what are the current laws and growth opportunities in the process of new buildings becoming old and the trend of new buildings imitating antiques.

The emergence of modernist architecture has transformed the face of global cities since the 1920s, thanks to technical advancement and the use of new materials. The new architecture refers to architecture that is mostly modern in nature, but also includes architectural forms that came after modernism. This form of new construction, which should be fairly incorporated into existing urban districts, is the focus of urban regeneration. Some methods of urban regeneration and the incorporation process of new and old buildings can be seen in the urban renewal programs of many great cities throughout history.

The International Building Exhibition Berlin (IBA Berlin) was an urban renewal project in West Berlin, Germany. It was initiated in 1979 and completed in 1987, fittingly the 750th anniversary of the founding of Berlin ("Berlin in Brief: History," n.d.). The IBA followed two distinct strategies: "Careful Urban Renewal" and "Critical Reconstruction" (Better, 2018; Hämer, 1990). The organizers of IBA argue that new buildings should be incorporated into existing communities, rather than being stand-alone like the early new buildings in Suburban Park, and that the mix of new and old buildings should be compatible with Berlin's urban texture and social problems ("Self-Construction Experiment Wohnregal," n.d.). New construction should be in keeping with regional culture and history, according to the IBA specifications. The applicability of materials is simplified, residents' involvement is allowed, and an experimental building is planned in Wohnregal, Berlin, under the category of old building renovation and renewal (Ghirardo, 1996; Liepe, Poppitz, Scheffler, & Sept, 2010).

The Grands Projects of François Mitterrand was an architectural program to create modern monuments in Paris, the city of monuments, symbolizing France's position in art, politics, and economics at the turn of the twentieth century (Chaslin & Picon-Lefebvre, 1989; "Grand Arche de La Défense," n.d.). The methods of incorporating the modern architectural language can be seen in urban intervention projects in Spain and France: First, a dramatic new architectural language, as well as the decoration of existing structures. Second, adding a completely new feature while maintaining the same climate. Third, regardless of other considerations, the use of a single architectural vocabulary (Ghirardo, 1996). (Figure 8)

Figure 8. Wohnregal in Berlin (left) and Louvre Pyramid in Paris (right)

2.3 Definition of Building Surface

As a concept of architectural theory, architectural surface has been given attentive respect. From the original meaning of the word, there are two concepts: surface and surfaces. Generally speaking, the surface covers a wider range, which refers to all forms of external forms of buildings, while surfaces emphasize the functional independence of buildings. Therefore, the architectural surface discussed in this study is the surface, which refers to the interface between the building and the external space, as well as the form and composition of its display. Generally speaking, the building surface refers to all the enclosed parts of the building except the roof. Under certain circumstances, for example, it is difficult to distinguish the boundary between the roof and the wall of a building with a specific geometric shape, or if the roof is regarded as the fifth elevation of the building from a specific observation angle, the roof can be seen as a part of the building surface.

In the theory of architectural design, the architectural surface can be traced back to the theory of German architect Gottfried Semper (Leatherbarrow & Mostafavi, 2002). The surface can be understood as decoration, and it is the interface of human contact in architecture. But its decoration is not a simple structure of shelter and beauty, more important to shape the space. Because the architectural structure can be completed by engineers, and the surface here must rely on the

architect. It is the expression of the combination of architectural structure, culture, and art. The architect is the carrier of the spiritual place and self-worth through the surface (Gottfied Semper, 2011). (Figure 9)

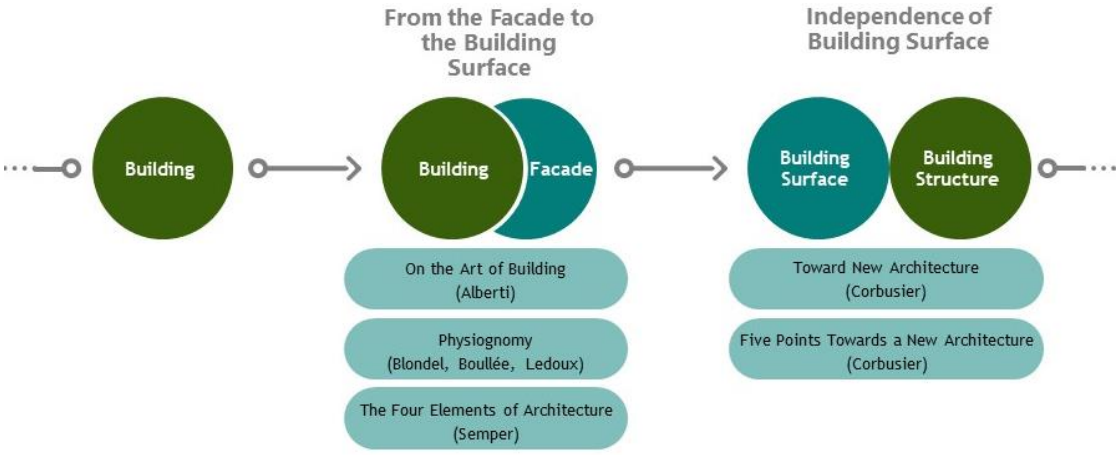

Figure 9. The Transformation of Building Surface

2.3.1 From the Facade to the Building Surface

In the traditional sense, the building surface refers to the building facade. In the western architectural system, architectural facade has always been the most significant form of architectural expression. From the religious expression of the Gothic church to the humanistic expression of Renaissance architecture, Leon Battista Alberti has used duality to distinguish decoration and structure in Renaissance (Mallgrave, 2006). Alberti first determined the relationship between the building structure and the facade, in which the architectural structure is the first, and the facade as the external object of the building structure is the secondary and subordinate relationship. As the main body of the building, the facade is described as a female image just like men. As the appearance of the building, the facade has two characteristics: the first is beauty, the second is decoration. The definition of beauty is the harmony of some parts and all of them. Beauty is the inherent and internal thing of the whole building, and the decoration is attached after, not inherent (Alberti, 1986). Like other Renaissance architects, Alberti also focused on the ancient Greek column. He defined the column as decoration and decorated it on its facade. The wall composed of the Greek column forms the wall building. We can see the attempt of facade performance in Santa Maria Novella church design, which shows

Alberti's attempt and theoretical construction to separate the building facade from the whole building.

In the 18th century, a group of architects, such as Jean-François Blondel, Étienne-Louis Boullée, Claude Nicolas Ledoux and so on, put forward the concept of "Physiognomy" in architecture (Donnelly, 2018). They thought that the external characteristics of architecture have their characteristics and can convey the social attributes of architecture. Based on the separation of the building facade and the building, the building facade not only has the function of decoration, but also has the significance of social attribute (Bédard, 1994; Kaufmann, 1952).

In the middle of the 19th century, the German theorist Gottfried Semper divided the primordial dwelling into four basic elements: the hearth, the roof, the enclosure, and the mound. The hearth is the core of the building, which belongs to the spiritual level. The roof and mound can be regarded as the structure of the building, which belongs to the material level. As the external wall of the building, the enclosure has both material and spiritual aspects, which is independent of the building structure (Gottfied Semper, 2011). Semper's theory can be regarded as the separation of architectural noumenon and architectural expression, and become two independent architectural categories. For the first time, Semper defined the exterior wall of a building as an enclosure, which included four aspects of form, space, function and technology in his theory. This shows that the building facade is completely independent. It not only has the function of beauty and decoration, but also has the function of dividing space (Frampton, 2001). Semper believes that the facade decoration of ancient buildings, such as color painting and bas-relief, originated from weaving art. Fences and woven fences are the earliest space enclosure of human beings. The structure is hidden under the woven fabric. The early structure is to support the role of woven fabric, and did not participate in the creation of space. Even after the development of architectural technology, masonry walls have replaced the original woven fabrics, but still retain the imitation traces of color painting and bas-relief. Woven fabrics are the source of building facade decoration, not the reproduction of historical style (Gottfried Semper, 2004). According to the "dressing" metaphor of Gottfried Semper, the development of the

appearance of early human architecture is consistent with the development of clothing and textile technology. The style and form of architecture depend on the treatment of materials. With the process of human civilization, architectural style develops especially just like the clothing of different nationalities. Because of the commemorative appearance of architecture, the architectural surface, which is purely dependent on technology and materials, appears in highly decorative form, and decorative symbols are endowed with meaning. Therefore, he suggested that the decorative means of classical architecture should be removed and the possibility of walls as pure space enclosures in modern times should be explored as the choice (Frampton, 2001).

Austrian architect and architectural theorist Adolf Loos is the most important inheritor of Semper's theory. Based on the "Dressing" metaphor theory, Loos's important essays *The Principle of Cladding* and *Ornament and Crime* points out the importance of the wall as a space enclosure, and the material of the wall has its formal language. To distinguish the difference between wall cladding and material decoration, the so-called wood coloring and plastering lines should be discarded Abandon (Loos, 1982, 1998). Henrik Petrus Berlage, a Dutch architect and architectural theorist, also highly praised the art of building space enclosure, claiming that smooth surface is the nature of the wall, and those structural components such as columns and capitals should be hidden in the wall (Berlage, 1996).

2.3.2 Independence of Building Surface

The development of modernism is a process from classicism to modernism. There are two preconditions for the change, one is the development of building structure technology, the other is the development of new building surface materials. The large-scale industrial production mode has brought about changes in the load-bearing structure of buildings. From the Bauhaus Building in Dessau designed by Walter Gropius, we defined the liberation of the building surface in the building. All the decoration in the facade has been weakened and negated. All the details are ironed like the folds of clothes. What we see is only the metal frame and glass surface (Schumacher, 1987). From Le Corbusier's theory and creative practice, we can see the process of this change. In 1915, Le Corbusier, in collaboration with

the engineers' Max Dubois and Auguste Perret, proposed the "Dom-Ino House". The "Dom-Ino House" prototype is the structural basis of Le Corbusier's architectural design. He proposed that the building should be standardized like a domino, with a series of standardized concrete columns as the structural support, and the floor slab should be set horizontally to form the architectural structural space. In the "Dom-Ino House" system, we don't see the building facade or building surface. It limits the box shape of traditional buildings to the most basic elements, thus distinguishing the two independent constructions of structural load-bearing and space enclosure, which is the basis of Le Corbusier's later "Five Points of a New Architecture". In 1923, Le Corbusier published the landmark book *Towards a New Architecture*, which proposed three key elements of architecture: mass, surface, and plain. The "Five Points of a New Architecture" put forward later makes the architectural surface as the wrapping coat of the building completely independent, and the architectural surface has become the most straightforward expression of "Form Following Function" in modernism expression (Corbusier, 2013). It can be seen that the "Dom-Ino House" system is the first process, the process of the development of the building structure system; the "Five Points of a New Architecture" is the second process, the process of the development of new building materials. The extensive use of glass walls may have a more profound impact on the building surface than the separation of structure and surface. Because of the use of glass materials, the wall has become a window, and the construction mode of the traditional wall opening window no longer works. The physical property of glass "Transparency" allows the building structure to be completely exposed. The building surface is no longer a component to cover the building structure, and the facade in classical architecture no longer exists. As some avant-garde art influenced architectural design at that time, the cubist painting changed the perspective relationship and used abstract painting to express different aspects of objects in the same plain (Giedion, 1959). Colin Rowe, an American-British architectural historian, proposed to use the collage and fragmentation method to make the building facade through geometric abstract expression, and all sides together to represent the architectural space form and structure (Rowe, 1984).

Through these changes, the surface of modernist architecture has the following effects: Firstly, the surface of architecture becomes free and continuous, which makes the facade of classical architecture obscure and disappear; second, the architectural surface is not only the enclosure space of the wall but also can bring deeper philosophical thinking and realize the depth of architectural space; and thirdly, the architectural surface gets rid of the function of bearing load and discusses its physical form in an abstract form.

2.4 Art Intervention for Decorate the Building Surface

According to the phenomenon and design trend, it seems that art is involved in the public space environment, artists and designers cross-border co-creation has become a director of design development. From the historical point of view to find the law of development, especially after the development of modern architecture law and change, verify the hypothesis of the art intervention development model. This part discusses post-modern architecture from the beginning of ironic classicism and latent classicism to high-technology periods (Jencks, 1991), improved design and digital surface design. This part also studies the change trends of architectural surfaces in the post-modern era and the theoretical basis of tracing such changes to establish a theoretical basis for the deduction hypothesis.

2.4.1 Art Intervention

Art intervention is an interactive experience activity in which the audience participates in the artistic environment. Art intervention is not limited to and exists in an artwork situation. More importantly, it is necessary to change the existing conditions of artwork. Art intervention has the characteristics of public intervention, so it can also be called “Public Intervention” (Spring, 2014). Art intervention is regarded as the method of residential co-creation building modular elements to improve the participation of residents and beautify the architectural environment, in line with the realization conditions of art intervention in the public environment (Miles & Hall, 2005). (Figure 10)

Figure 10. Public Art in Shopping Mall of Bangkok

What is art? According to Paul Oskar Kristeller's definition of art, when art is independent of religion and political authority, art becomes a signifier with a fixed connotation, which refers to painting, sculpture, architecture, music, and poetry (Kristeller, 1964). Admittedly architecture is one of the art categories, but with the development of science and technology and the rise of modernism, architecture is not pure art. From the beginning of modernism, the pragmatic characteristics of architecture are accompanied by new materials and new technologies. The rapid development of the past 100 years has completely changed the appearance of the world cities which had developed for centuries. The classic quotations of Oscar Wilde have a section of "Life imitates Art far more than Art imitates Life" (Wilde, 1982). Because of the consideration of structure and function, architectural design is more based on systematic rational thinking, and aesthetics is also based on mathematical formulas. Especially in modernist architecture, Le Corbusier called "A House is a Machine for Living In" (Corbusier, 2013). It extremely rationalized the building to lose the perception of human culture. Using art intervention methods to explore the art intervention possibilities of architecture, integrating art into architecture, or expressing more emotional elements to rational buildings, which are art intervention modes.

2.4.2 From Decorative Arts to Contemporary Art

From the origin of design to find the method of architectural surface decoration. From William Morris's Arts and Crafts movement to Art Nouveau, from Art Deco to Constructivism. Early design art performance more from the decorative up performance, of course, this facade also has decorative style for building facade and surface form of expression (Moughtin, Oc, & Tiesdell, 1995).

Art Nouveau is a style of art, architecture, and applied art from around the world, with a focus on the decorative arts. Between 1890 and 1910, it was known by various names in different languages: Jugendstil in German, Stile Liberty in Italian, Modernisme català in Catalan, and so on (Sterner & Fahr-Becker, 1982). It abandons conventional decorative styles in favor of a modern natural aesthetic. It emphasizes that in nature, there are no straight lines or plains, and it emphasizes the curve and organic form in decoration. In the works of Antoni Gaudí in Spain and Victor Horta in Belgium, we can see the application of artistic lines in building facades. The Art Nouveau movement mainly takes place in Europe. Riga, the capital of Latvia, has about 800 Art Nouveau style buildings, which is the city with the most art nouveau buildings. In terms of style, its art nouveau style architecture is influenced by Austria, Finland and Germany, and can be divided into four categories: Eclectic or Decorative; Perpendicular or Vertical; National Romantic and Neo-Classical. These categories are not always mutually exclusive, and many buildings show the influence of several different styles. We can see the use of Alphonse Mucha's paintings in architectural decoration in these building facades. (Figure 11)

Figure 11. Art Nouveau Architecture in Riga

De Stijl, Dutch for "The Style", is an artistic form of expression in the 1920s. It advocates abstraction and simplicity, and its shape is reduced to a geometric shape. The color only uses the three primary colors of red, yellow and

blue, and the combination of black and white. Piet Mondrian's *Composition II in Red, Blue, and Yellow* (1930) is the most typical painting of the De Stijl. In the design of Rietveld Schröder House in Utrecht by Gerrit Rietveld, a stylist architect, we can see that the red, yellow and blue paintings are almost three-dimensional into the facade of the building. The expression of artworks to architectural design is presented with the help of an architectural facade. In contemporary architectural design, the boundary between architectural surface texture and contemporary installation artworks becomes blurred. We can see that the expression form of the architectural facade is so similar to that of contemporary art. The repetition of a sense of order in Contemporary Art makes the objects that we take for granted become thoughtful artistic elements. In contemporary architectural design, the defamiliarization theory of architectural surface is used to subvert people's visual cognition and stimulate people's curiosity. (Figure 12)

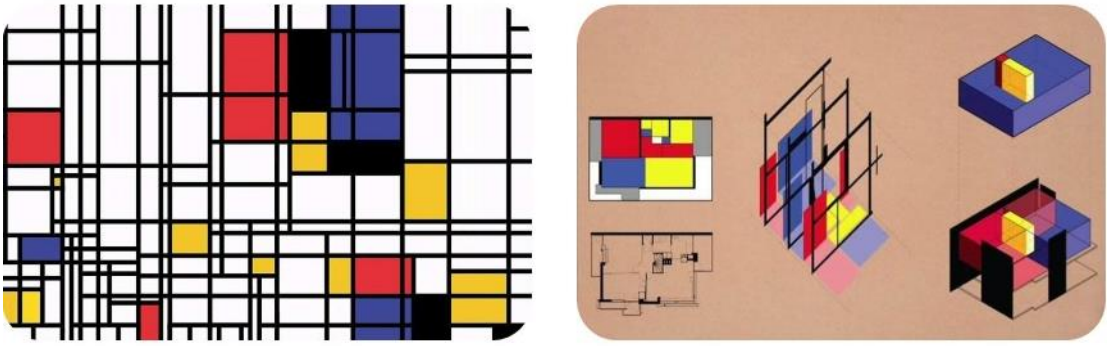

Figure 12. Piet Mondrian's Art and Gerrit Rietveld's Design

Art is involved in modern urban public space, and more and more installation artworks appear in urban commercial space, city square, or other urban space. Cross-border products designed by artists and designers are also widely praised by consumers. The contemporary desire for artworks is not limited to the collection of artworks by collectors. More and more people are willing to use artworks as commodities. In the context of post-modernism, contemporary art forms such as installation art and performance art make ordinary people feel that the boundary between art and life is not so obvious. In the eyes of artists, the objects in daily life and the forms created by ordinary people, under certain environmental conditions, are also works of art. (Figure 13)

Figure 13. Decoration of Thai Temple

The reality is that to maintain the most basic functional needs, residents use low-cost materials to improve their living conditions. Artists can see the beauty of non-conventional materials in part, such as the new and the old, the hard and soft, and the collision of colors. These are the inspiration sources in artistic creation. However, the reconstruction projects completed by the residents by chance cannot coordinate the relationship between the locals and the environment as a whole. Of course, the residents pursue the basic aesthetic feeling under the condition of the functional requirements of the transformation. However, the residents do not have enough understanding of beauty. Such reconstruction projects are more likely to cause damage to the context of the block, confusing the overall style. (Figure 14)

Figure 14. Installation Art and Building Surface

The transformation from art to daily life is the concrete realization process of design link. The design follows the general law of aesthetics and arranges the real objects according to the rules. Design is an art form that is easier to realize. Design is to solve people's lifestyle, purposeful behavior, through rational and comprehensive creation to pursue a universal balance and harmony of human thinking (Raizman, 2010). Because of the objective function of the design, there will

be more basic requirements for elements such as color, shape, and material. In reality, this is the premise for residents to choose materials as objective function improvement. For the combination of materials, the principle of design is to combine elements with rationality and clear consciousness. Design is not the expression of self-emotion, but the expression of society. The purpose of design is to solve problems, based on universal human values and spiritual resonance (Hara, 2007). (Figure 15, 16)

Figure 15. Installation Art

Figure 16. Building Surface

Joseph Beuys, the German artist, put forward that “Everyone is an Artist” (Joachimides & Rosenthal, 1974). Contemporary art makes the boundary between art and life blurred. It does not mean that art is equal to life, but that art always exists

in human social activities. Art is involved in public space, so that contemporary art is not only a collection in the gallery, but also closer to the life of ordinary people. Ordinary people also have the potential to become artists, have yearning for art and aesthetic appeal, and can spontaneously cultivate aesthetic ability and improve aesthetic taste. The concept of art has become more and more extensive. In addition to the traditional art fields such as art, sculpture, music, dance, drama, literature, and design, beauty can be produced everywhere in daily life and can become a form of art everywhere. The attention of contemporary art to the concept consciousness and narrative process, even the motivation and recording process of behavior can be interpreted as art.

2.4.3 From Reproduction to Non-reproduction

Postmodern architecture is the opposite of modernist architecture. Early postmodernist masters use exaggerated expressionism to declare war on modernism. The collage-style symbolic combination makes architecture become an exaggerated stage setting in the city, such as Piazza d'Italia in New Orleans designed by Charles Moore. From the early postmodern architectural language to what is postmodern architecture, Charles Jencks shows that postmodern architecture inherits and develops modernism rather than opposites (Jencks, 1991, 1996). But postmodern architecture is a complex process of change, a series of experimental architectural entities. It is not a system, and there is no standard construction model. It can be seen as a process of improvement and speculation attached to the modern architectural system, and this process continues (Jencks, 1982). From the late 1970s to the early 1980s, the decorative technique of historical eclecticism is the initial form of postmodernism. It uses historical symbols to convey meaning and explore the meaning of architecture. At this time, the significance of architecture has been reduced. The historical style is not a part of the whole society, but it is only the exploration of some elites for modern architecture, which can be understood as the remembrance and reappearance of historical achievements.

Robert Venturi, a pioneer of postmodernism, questioned modernist architecture in his book *Complexity and Contradiction in Architecture*. His book *Learning from Las Vegas* expresses the characteristics of postmodern architecture

and should be a memorial to history, the expression of emotions, the friendliness of the environment (Venturi, 1966; Venturi, Scott, & Steven, 1988). Robert Stem in the *New Directions in Modern American Architecture* more clearly pointed out “there are 3 main areas of Postmodernism: the allusionism (importance to cultural memory), the contextualism (importance to city), the ornamentalism (importance to facade)”(Stern, 1977).

In the late 1970s, a postmodern classicism emerged. Architects such as Charles Moore, James Stirling, Hans Hollein and Aldo Rossi incorporated convention, metaphor, ornament and polychromy to create a “Free-style Classicism” (Jencks, 1982). Moore’s Piazza d’ltalia, a public plaza in New Orleans dedicated to the Italian-American community, is an example of this new classicism. Classical arches and columns, as well as echoes of Renaissance and Baroque architecture, are used in this project, which is influenced by the Greek Agora and the Roman forum. Moore, on the other hand, had his Ionic capitals made out of spirals of luminous stainless steel, which he enhanced with neon light’s glow and colour. Because of these radical changes, architect Robert Stern coined the term “ironic classicism” to describe this form of postmodernism (Stern & Gastil, 1988).

In the contemporary architectural surface design, it is no longer a simple style and form, and the restoration of history has been replaced by other methods. From Herzog & de Meuron’s many architectural projects, we can see that there is no fixed pattern of contemporary architectural style. Architects try to express architectural surfaces in historical context, material noumenon, and composition. Building a surface is to create a new material language, a new authenticity, and this authenticity is reflected in the reuse of traditional materials. The daily materials are changed into visual impression completely different from their original appearance attributes through new processing methods, and they show another new sense of the reality of materials in an unfamiliar way, rather than the reality seen (Kipnis, 1997). In contemporary architectural theory, this is called the defamiliarization of architecture. The application of contemporary building surface in materials is not away but also using modern information technology to express history and technology. For example, French architect Jean Nouvel’s “Surface Media”, using new

technology to transform the surface into a screen to convey information. Space is no longer as important as ever. The information conveyed by materials, texture, and surface itself is the lateral focus of architecture.

The modernist architecture shows the independence of the architectural surface, and the postmodern period is a representation of the architectural surface and complicated non-reappearance process (Zhao, 2005). Postmodern architecture is not a style nor a form of complete confrontation with modernism. Postmodern architecture can be understood as a stage after modernism that continues to this day (Ghirardo, 1996). Postmodernism has different styles and forms in different periods (Jencks, 1996). Postmodernism emerged after modernism prevailed. Resisting inanimate modernism, postmodern masters adopted decorative techniques of abstract classicism, especially in architectural surfaces providing a representation of history. However, with the development of science and technology, postmodern forms of expression are no longer limited to the imitation of history but also have a yearning for the incorporation of science and technology. Architectural forms, such as high technology, have emerged, and imitation has changed from reappearance to non-reappearance. It can only be achieved through imagination because the future is unpredictable. The form of expression is that a building's surface presents transparency so that the internal structure is completely exposed (Feng, 2008). When architects found out that the pursuit of technology was impractical and architectural surfaces had lost the original characteristics of materials, they reverted to the reappearance of building materials. Reformist architecture explores the possibility of using traditional materials on the surface and achieving defamiliarization of non-building materials so that the relationship between buildings and people would not be strange, and buildings could return to the scale of people (Islami, 2009). With the introduction of artificial intelligence and the rapid development of computer technology, parametric computer expression is now used on building surfaces, and a form of architectural surfaces that cannot be achieved by humans has been achieved through machine operations. This abstract means of expression can be understood as a non-representation of architecture. Therefore, the surface of post-modern architecture exhibits a cyclic mode, that is, from reappearance to non-

reappearance then from non-reappearance to reappearance. The content of each period differs. The first reproduction reproduces history and tradition and exaggerates the decorative elements in historical buildings. The second is the reappearance of common materials and scales; it brings buildings down to the spatial scale and creates intimacy between materials and people. We can see the change in the core content from the breakthrough of new materials to the pursuit of digital building surfaces. (Figure 17)

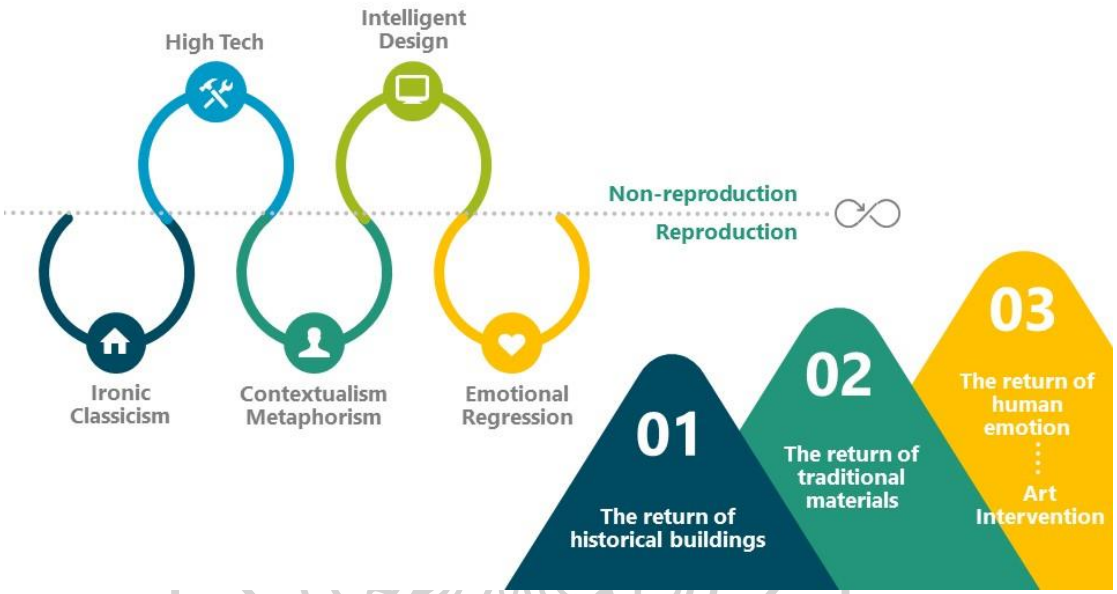

Figure 17. Hypothesis Derivation Process

From the current rapid development of artificial intelligence, we can expect future development models to be different from previous innovations, and the center of human creative activities will change from mechanical innovation to human innovation. Innovation is no longer to create machines for replacing people's repeated labor, but to transmit people's thinking and emotions through the creation of things (Somers, 2019).

2.5 Chongqing as Case Study

Chongqing, located in Southwest China, is the largest municipality directly under the central government. With its unique topography and the slogan of landscape city, Chongqing has created several "Influencer Sites". Since 2015, Chongqing has attracted a large number of foreign tourists to "Clock In". The most direct effect of the promotion of city image is the growth of the cultural tourism

industry. The rapid development of the tourism industry, in turn, promotes the renewal of urban old block buildings. (Figure 18)

Figure 18. Image of Chongqing

The government-led renovation mode is mainly manifested in the main streets and historical buildings, while the stagnation of the secondary streets exposes the problems in the reconstruction of old buildings. Xiahao Old Street is selected as the secondary street reconstruction, and the site contains traditional buildings and modern structural buildings. As the effectiveness of the verification method of building classification transformation mode, it has more universal and applicable value to other areas of design.

2.5.1 Chongqing Old Streets

In 2015, Chongqing issued the *Protection and Utilization Planning of Traditional Style and Features in Main Urban Area of Chongqing*. By reviewing the historical evolution of Chongqing, clarifying the urban context, refining the features, and mining the historical resources, the plan proposed five types of traditional features of the main urban areas, including “Traditional Bayu”, “Ming and Qing Immigrants”, “Opening Up Ports to Build Cities”, “Auxiliary Capital of Anti-Japanese War”, and “Southwest Region”. Twenty-eight traditional feature areas were identified and formed as a whole body of urban traditional style and feature protection. Twenty-eight traditional landscape areas: Ciqikou, Jingangbei, Huguang Guild Hall, Ciyun Temple - Mishi Street - Longmenhao are four historical and cultural blocks;

Chongqing City Wall Ruins, Shibati, Shanchengxiang, Yudong Street, Cuntan Street, Tongxing Street, Mudong Street, Huangjueya Street, Yuzui Street, Baixiang Street, Datong Street, Beibei Old Street, Zhongshan 4th Road, Liziba Street, Shandong Street, Nanshan Street, The 10th Ordnance Factory, People's Auditorium, Datianwan Gymnasium, Chongqing Steel Factory are twenty traditional scenic areas; Fengsheng Town, Pianyan Town, Zouma Town, Longxing Town are four famous historical and cultural towns. (Figure 19)

Figure 19. Category of Historical and Cultural District in Chongqing

The reconstruction of these projects and the problems in the process of transformation can reflect the main problems in the reconstruction of Chongqing's old city, and the buildings in the blocks can also represent the main types of buildings in the city during the reconstruction process.

According to the planning, the Chongqing municipal government has carried out part of the planning and design and project construction for twenty-eight traditional landscape areas. The reconstruction of these projects and the problems in the process of transformation can reflect the main problems in the reconstruction of Chongqing's old city, and the buildings in the blocks can also represent the main types of buildings in the city during the reconstruction process. The area of four famous historical and cultural towns is too large to be within the scope of the

investigation. This study investigates and analyzes the twenty-four blocks with traditional features and summarizes them into three types based on whether there are original residents as the limiting condition and whether the reconstruction project is implemented. (Figure 20)

Figure 20. Map of Historical and Cultural District in Chongqing

The first is government-led street and renovation projects. This kind of project mainly focuses on commercial and non-commercial reconstruction, and there are no original residents inside. The reconstruction model is mainly to protect historical buildings, and the newly built antique buildings restore the historical scene.

Among them, the non-commercial reconstruction is mainly the historical building group, the historical industrial site is mainly, and the original site itself has no residents.

Commercial projects are the focus of this kind of transformation. Taking the overall reconstruction mode of Shibati as a typical model, Shibati block is one of the most distinctive blocks in Chongqing, and it is the main road connecting the upper and lower urban centers of Chongqing, and its reconstruction work is also one of the key projects in the whole urban construction. The reconstruction of the eighteen stairs adopts the old as old mode, retaining the original stone road, some trees, and environmental facilities. For the block buildings, the mode of antique reconstruction is adopted. The interior is a reinforced concrete structure, and the

exterior is restored and decorated with demolished bricks and tiles. The most typical feature of the transformation is that the original residents have already moved out, so the block is only a commercial mode, losing the life flavor of the street life. It can be seen from the statistical table that this kind of mode is the main form of urban old block renewal, especially in the center of the city, its commercial value is greater than the significance of building renewal. But if this form is created with empowering results, it will become less exciting and the buildings in the block are just fake antiques in traditional clothes. (Figure 21)

Figure 21. Image of Shibati's Street Details

The second is residents-led street and renovation projects. In the process of street renewal and reconstruction, according to the degree of government participation, there are government planning residents-led street renewal mode, and residents are completely spontaneous street renewal mode.

Among them, "Ciqikou" as the representative of the ancient town block form represented a typical case of the government planning residents leading mode. Ciqikou Ancient Town is a typical traditional village and town in the Chongqing area. The overall architecture maintains the style of the Ming and Qing Dynasties in China. The area of the ancient town is large, and the whole block keeps the situation of residents living in it. Among them, the original texture of the road surface remains unchanged, the facade of the building has been repaired and treated under the guidance of the government planning, and the residents along the street have made their transformation, so that the houses along the street can be changed into shops,

in line with the modern commercial form. At present, this kind of block form is generally far away from the city center, so the whole street can be preserved relatively intact. (Figure 22)

Figure 22. Image of Ciqikou's Street Details

The form of self-generating block is represented by Shanchengxiang. Shanchengxiang is an old block built along the mountain near the downtown area of Chongqing. The block is mainly composed of traditional residential buildings in East Sichuan, interspersed with some "Shikumen Buildings" in Shanghai during the period of the Republic of China. As a result of years of disrepair, some residents have carried out self-made renovation of their houses, which has lost the style of traditional buildings. The facade has been covered with red bricks and temporary materials. Because these streets and buildings retain the original texture and living habits of the city and are located in the center of the city, they can attract a large number of foreign tourists to feel the unique road of the mountain city Chongqing. At present, it has attracted a large number of new business residents to carry out local spontaneous renovation along the street. This kind of transformation mode has its way, mainly to beautify and attract tourists, but on the whole, it does not consider the coordination and identity's consistency of the block. (Figure 23)

Figure 23. Image of Shanchengxiang's Street Details

The third is the stagnant original streets. When the neighborhood dominated by residents has commercial value, it can attract tourists to the development of the tourism industry. When the geographical location of the street is inconvenient and no tourists participate, the renewal and improvement of the old street will be in a state of stagnation. This kind is the starting point of the old block reconstruction and the most complicated part of the objective conditions of the streets in the city. For example, Ciyun Temple - Mishi Street - Longmenhao historical block, due to its large area and wide range, some blocks without historical protection value are in a state of stagnation. For example, the Jingangbei historic district is planned by the government in the main street, and the building renovation of the secondary street is not displaying the sense of the original style. (Figure 24)

Figure 24. Image of Longmenhao's Street Details

2.5.2 Chongqing Old Buildings

From a historical point of view, the old blocks in Chongqing have complex architectural forms. First of all, it is a typical building structure and decoration system building, which is a typical building structure in southern China. Chongqing, located in Southwest China, has adopted the form of a stilted building with overhead ground floor and fixed structural columns on slope land due to its uneven terrain. In practical application, flat ground is a kind of bucket house, and part of it adopts a stilted building structure, which is the traditional housing system in Chongqing. However, the main structure of this kind of building is wood. In the later stage of reconstruction and repair, the traditional external form is retained. The internal framework adopts the brick concrete structure system of modern buildings, or in multi-story buildings, the bottom layer is a brick concrete structure, and the two-story and roof type adopts the bucket type building structure. The situation of this kind of buildings is relatively complex, some of them are difficult to define the type of buildings, the general changes are more serious, it is difficult to see the structural system of traditional buildings, at present, mainly demolition.

Second, as an early port city in China, Chongqing, especially on the South Bank of the Yangtze River, is located in a large number of former foreign embassies. With the integration and development of foreign culture and Chinese culture, the historical architectural style of the integration of Chinese and Western cultures formed in that special historical period. Especially during the Second World War, the Chinese national government moved its capital to Chongqing, which was regarded as the temporary capital during the Anti-Japanese war. During this period, a large number of Chinese and western buildings, such as embassies, foreign companies, and official residences, were built. This style is generally called the style of the Republic of China. This kind of buildings often exists in the old blocks as historical buildings, and the reconstruction also adopts the way of the original restoration.

Third, in the early days of the founding of the people's Republic of China, the state was short of material resources and built a large number of collective houses to meet the people's basic living conditions. This period was also the period

when China received the aid of the former Soviet Union, so the Soviet-style collective housing was the mainstream style of the whole socialist country at that time. Such residential buildings in China did not stop building until the late 1980s, so this kind of collective housing is the main body of the transformation of old blocks and old houses in China. Due to the large number of them, China has adopted a variety of ways to renovate such houses, such as laying water and electricity pipelines, adding vertical elevator systems, and updating facades. (Figure 25)

Figure 25. Three Types of Architectural Style

Through the analysis of Shibati, Ciqikou and Shanchengxiang, the three typical old streets are analyzed. From the traditional features of Chongqing's five main urban areas, and four kinds of original building types of old streets are obtained: (Figure 26, 27, 28)

1). Modern Style Building. The overall structure of the modern-style building is complete, and only the maintenance of the building facade can be used for reconstruction.

2). Historic Building + Additional. Historical buildings with a certain value. In the later period, buildings of destructive style were built, and demolition of illegal buildings was required.

3). Traditional Residential Building (Timber Structure). The traditional residential buildings with wooden structures are demolished or repaired by traditional techniques according to the damage of the building.

4). Traditional Style Residential Building (Brick Structure). The traditional-style residential building with a brick-concrete structure itself has no historical value, but the structure is intact and can be maintained and reconstructed.

Figure 26. Chongqing Old Building Types

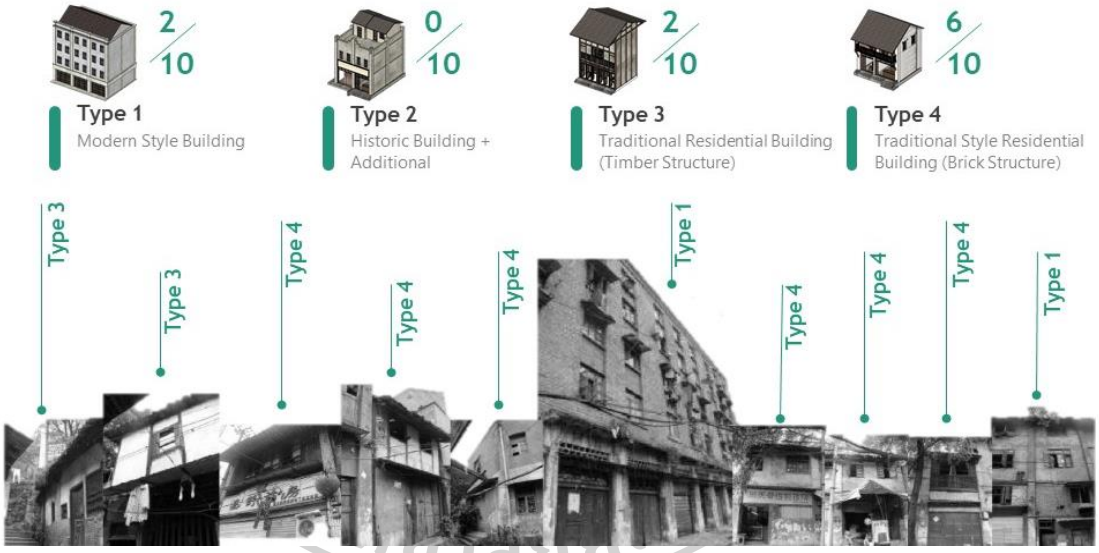

Figure 27. Building Type Analysis

Figure 28. Feasibility Analysis of Building Regeneration

In the quantitative analysis, traditional architectural style and masonry structure are the main types of this kind of old street reconstruction. The second is the old houses in modern architectural form. This kind of buildings is mainly composed of collective apartments, which were built at a relatively later age, retaining the characteristics of China's planned economy period. The main purpose of historical buildings is to restore the original appearance and demolish the destructive expansion part. The number of complete traditional residential buildings in urban blocks is also very few. For the parts whose structures are completely damaged, the method of demolition is adopted to expand the urban public space environment. If there is the possibility of retaining the building, the original restoration method is adopted. (Figure 29, 30)

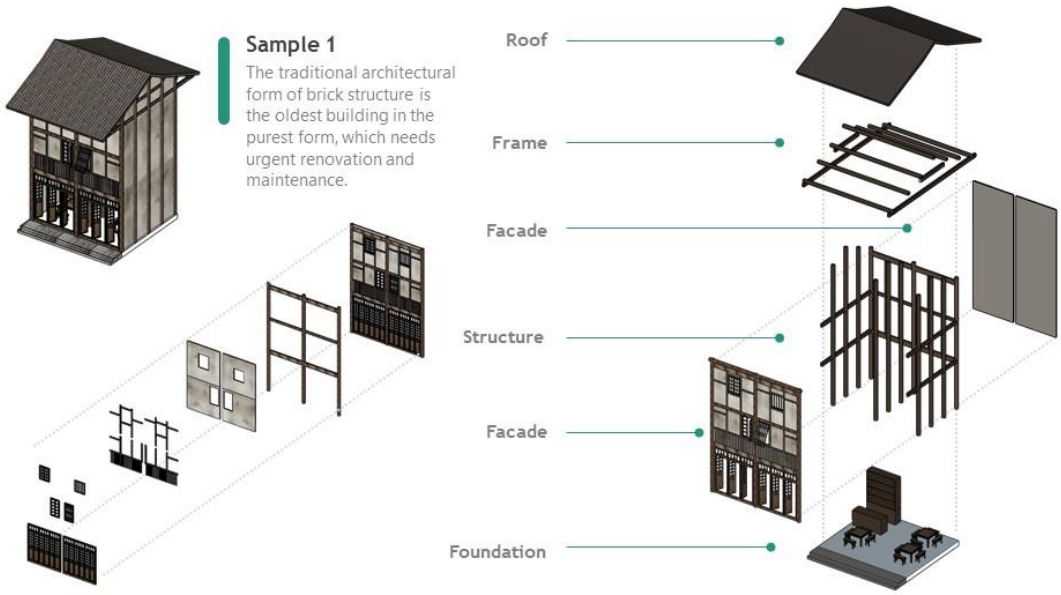

Figure 29. Structure and Facade Analysis of Traditional Building

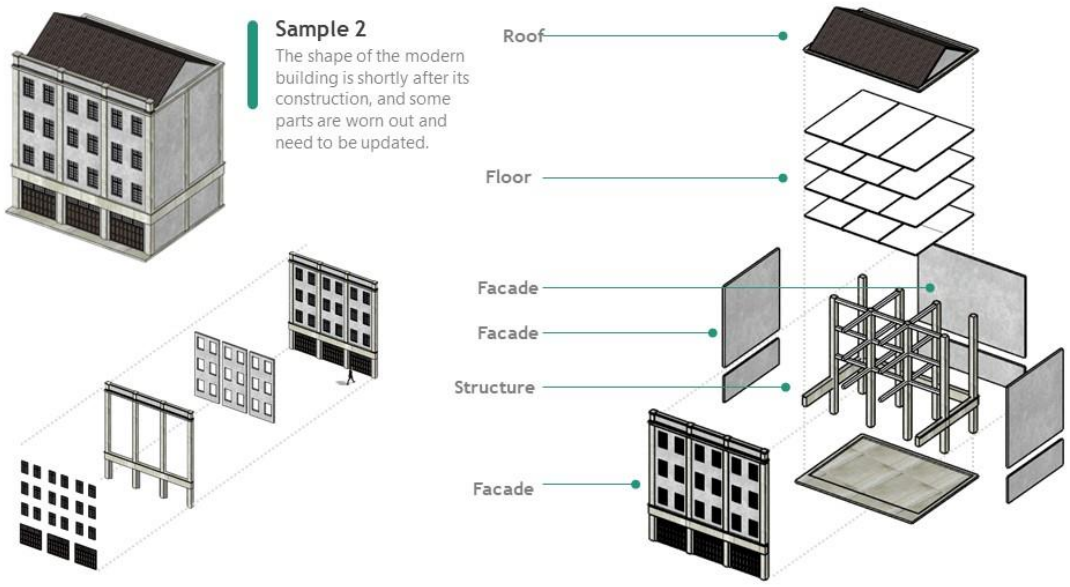

Figure 30. Structure and Facade Analysis of Modern Building

2.5.3 Chongqing City Characteristics

The architectural style is characteristic of Chongqing. There are stilted buildings with local characteristics and Mingguo buildings. The number of skyscrapers in Chongqing is among the top in China. With the strong contrast between the modern and the past, the description of punk-cyber film sense has become the pronoun of new Chongqing. A single building with regional characteristics may not be a symbol of the city, but the architectural groups that allow all kinds of conflict and fusion together are the symbol of Chongqing's urban texture. (Figure 31)

Three-dimensional transportation is another characteristic of Chongqing that is different from other cities in China. Chongqing's three-dimensional transportation system includes urban rail, overpass, ship, bridge, cable car, cableway and other means of transportation, which appear in the same city image. Besides, the number of overpasses in Chongqing is large and the structure is complex. The rail transit runs along the mountains of the city, which is different from other urban traffic networks. Due to the limitation of urban terrain, the original urban center is located in the mountains between the two rivers. The urban roads are different from the grid form of general urban planning, and are crisscrossed vertically. It is these geomorphic features that make Chongqing's transportation described as an 8D urban transportation network. (Figure 31)

Lifestyle is the most representative element of the urban atmosphere. It contains rich things, including diet, folk customs, handicrafts, and elements ties to humanities. Whether it's the late-night street stalls or the spicy hot pot on the street; the human porter from the wharf culture; the warm and cheerful taxi driver. These tangible and intangible symbols of urban human characteristics make Chongqing different from other big cities in China. More and more tourists shuttle through the mountain city trail of Chongqing to feel the fireworks atmosphere of the city. (Figure 31)

Figure 31. Three City Characteristics of Chongqing

2.6 Summary and Theoretical Framework

From the elaboration of the concept, principle and participation degree of participatory action research, it is concluded that PAR is the main factor different from other research. PAR is the theoretical framework of this study, and the core of PAR is residents' participation. Then, from the concept definition and differences from participatory design (co-design) to co-creation, it is more in line with stakeholders to determine the goals and principles of co-creation. At present, the main application of participatory design in the field of urban renewal is the renovation design of the community announcement environment, and the residents' self renovation of the building facade is a gap in the current co-creation. The residents-centered decoration and renovation are more in line with the highest stage of participation in PAR, that is, the stage of self-mobilization. It is more in line with the democratic concept of PAR to create an overall beautification of the community public environment with the individual environment.

The old buildings in the city need to be updated to meet the visual and functional needs of modern people. The renewal of historical buildings is conservation and restoration, and the old buildings without historical value are the main scope of architectural regeneration research. The designer's regeneration of the old building is the overall or partial reconstruction and rebuild, and the residents' regeneration of the old building is the partial repair. Designers pay more attention to the overall decoration effect. Although the regeneration is efficient, the forgery is not low, and the influence of residents in the regeneration is not considered. Residents pay more attention to local repair, low cost but no integrity, and do not consider the urban texture. The gap is that there is no efficient and cheap old building regeneration mode, which considers the later adjustment and renewal.

Starting from the architectural history, from the appearance of the building facade to the existence of the building surface independent of the building structure, it shows that the building surface, as independent building construction, can complete the renewal of the building enclosure through the regeneration of the building surface, and the purpose of the building surface is decoration, which makes it clear that the goal of the old building renewal is the decoration and beautification of the building surface, and narrows the scope of this study. The renovation of the old building surface is the joining point of designers' and residents' co-creation design. At present, there is no effective renovation mode of old building surfaces to achieve co-creation.

From the research of art intervening in public space to the research of art intervening in the architectural surface, the scope of research is further narrowed. And starting from the core link of art intervention, the purpose of art is citizen participation. Using art intervention as a method of residents' co-creation design is in line with the set goal. On the other hand, looking for the expression form of architectural surface decoration, since the separation of the architectural surface indicates the independent existence of facade decoration, art intervention in architectural surface decoration has become the theoretical basis of free creation. From the early decorative arts to the image of contemporary art on the architectural surface. Postmodern pop art, as a creative means of residents' co-creation design, is

not only in line with the core of postmodern creation, but also in line with the aesthetics of contemporary residents, and can represent the characteristics and texture of the city. Based on the above conditions, the current gap is that there is no effective art intervention method to realize residents' participation in co-creation. (Figure 32)

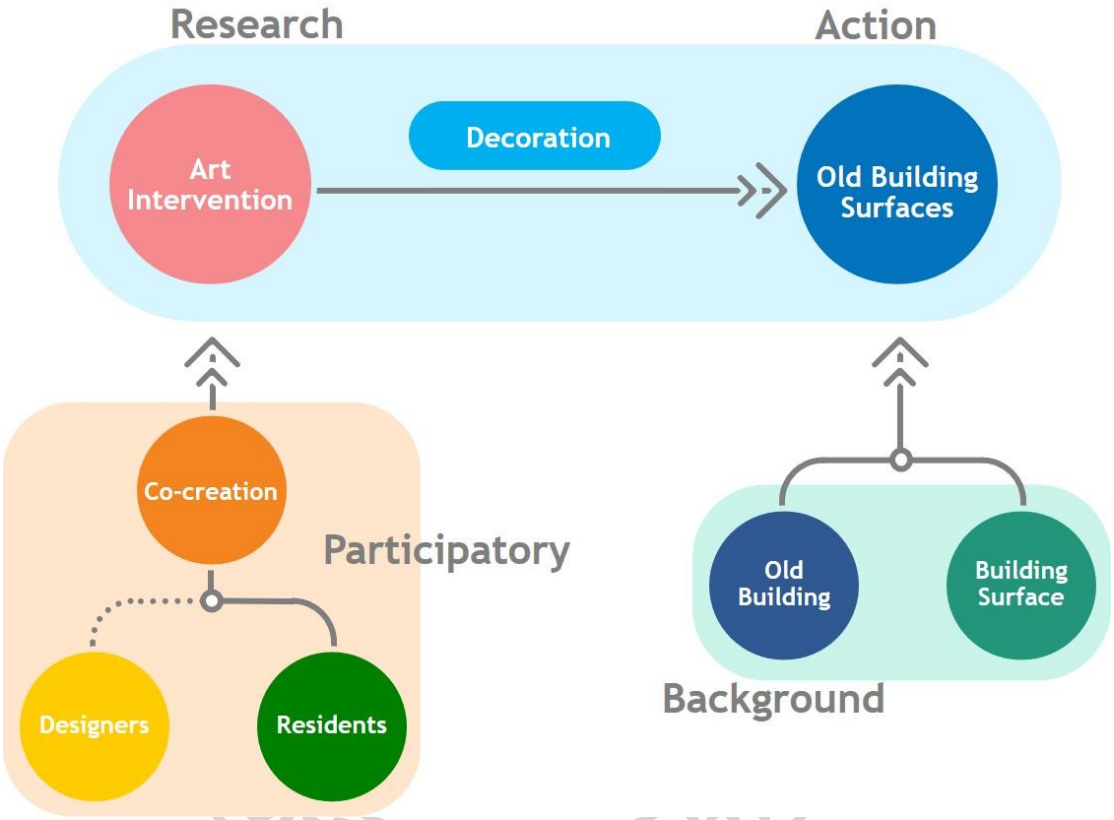

Figure 32. Theoretical Framework

Chapter 3 Research Methodology

3.1 Research Methodology Framework: Participatory Action Research

The research methodology starts from the participatory action research (PAR), takes “Participatory” as the core framework of co-creation. Taking the four steps (Plan-Act-Observe-Reflect) of “Action Research” as the research process framework, and goes up in a cycle. It adopts a variety of methods, such as literature review, case study, workshop, theoretical deduction, design practice, interview to carry out design research.

3.1.1 Participatory, Action and Research

Participatory action research (PAR) is a research approach, not a research method (Alexander et al., 2007). Participatory action research emphasizes the role of participants in each stage based on action research. The purpose of action research is to improve practice, and its core is to improve research through action. Action in action research means that people should take concerted action and carefully observe what will happen. Consider what will happen during and after the action, and respond and make changes to unexpected problems that arise in the process. Research in action research means answering questions and ensuring that there is sufficient evidence for any action or change. It is not limited to the traditional theory and universal law. Thus, action research can help people get a better understanding and more practical feedback, and apply it to the process, to improve practice (Crane & Richardson, 2000; Rosier, 2015). (Figure 33)

Figure 33. Research and action elements of PAR

3.1.2 Plan, Act, Observe and Reflect

Action research realizes the research process through the cycle research process. The changes in the process of action research can change the new direction of action research and produce new strategic steps. Each cycle consists of four stages: plan, act, observe and reflect (Alexander et al., 2007; Crane & Richardson, 2000; Rosier, 2015). (Figure 34)

Plan. Action Research planning includes deciding how to respond to questions, issues, and what to try out. The plan outlines the details of implementation. It involves designing a framework to guide action. It may require a planning process with a range of different stakeholders. The planning consists of three main stages. These include clarifying the issues raised, identifying actions to be attempted, and developing action plans.

Act. Action will be taken after the plan is completed, and the action is intentional and strategic. In participatory action research, actions will change strategies according to the actual situation, not just experiments to verify whether they are effective. The first step is to systematically implement the plan, the second step is to communicate with the participants, and the third step is to track what happened. The final stage involves stakeholders who may change any action.

Observe. Good observation requires looking at what's going on and describing it accurately. It includes how observations can be preserved for later reflection or evidence. Observation is very difficult, especially when the observer tends to interpret directly and make judgments. The process of observation needs to be seen as research, not just as getting results. The three stages of observation include observing what is happening, describing what has happened and recording what has happened.

Reflect. Reflection is about understanding the consensus about what happened. Essentially, it is an interpretation process in which various information and perspectives may produce different understandings. Reflection helps to improve practice and judge whether the practice is correct. Reflection includes several stages, such as regression of the results that have occurred, the upcoming assumptions, and the re-understanding of the problem.

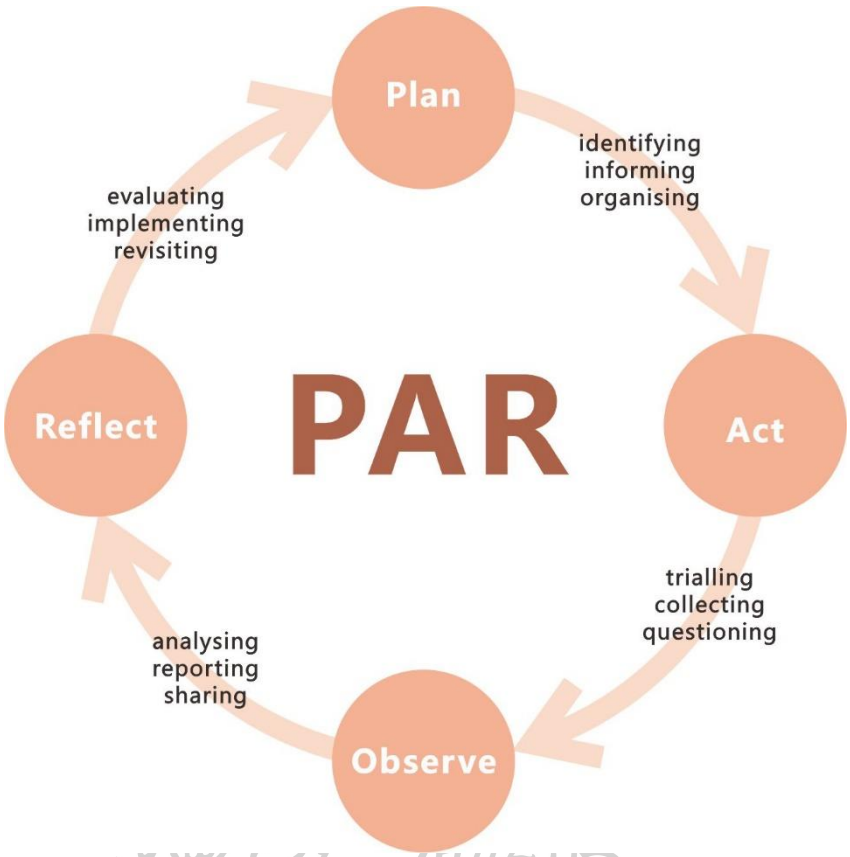

Figure 34. PAR Research Cycle

3.1.3 Cyclic Research Process

Studying complex problems usually involves multiple cycles, each strategy be developed, implemented, observed in action and then reflected on. As the cycle repeats, stakeholder participation may increase. This can stimulate a better understanding of what is needed. Or maybe the research starts with a small problem and then leads to a bigger one. The iteration of the period is not fixed and has periodic characteristics (Crane & Richardson, 2000; Rosier, 2015): (Figure 35)

1). Flexibility. Cycles may not occur in successive steps. As new understandings emerge, they can overlap, repeat, or expand.

2). Systematic. Action research projects can not be too flexible, because they will lose direction and clarity. Systematic planning means that people can see and reflect on what is happening.

3). Developmental. Action research will evolve.

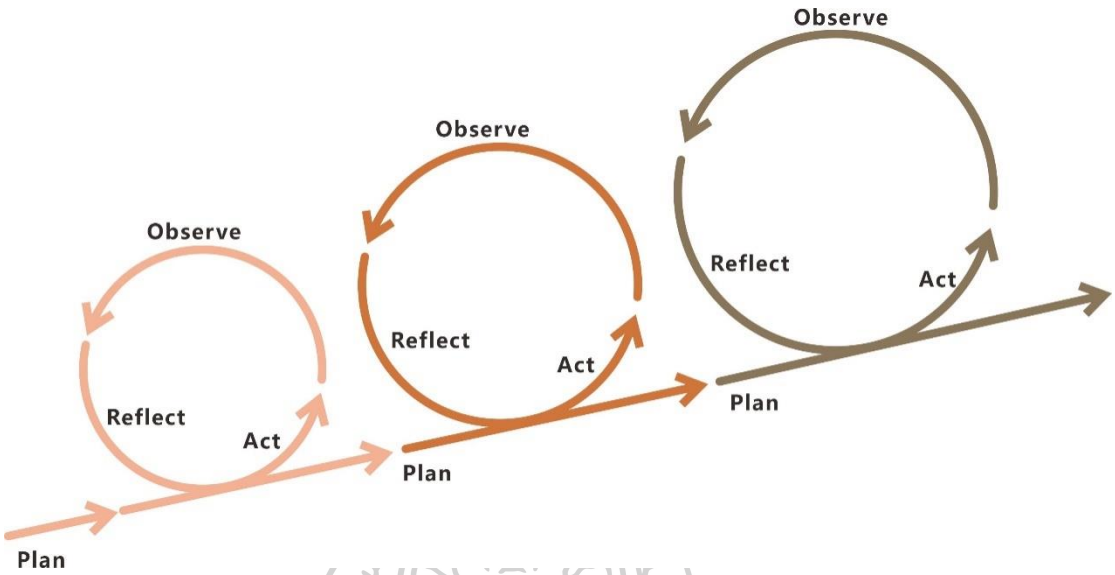

Figure 35. Building Upon PAR Research Cycles

3.2 The Research Methodology Approach

3.2.1 Methods of Research

For the resolution of complex problems, there are often more than one reason for its emergence and development. In the macro study, we consider the complex whole into individual elements, analyze the individual in multiple ways, and finally return to the overall consideration. This kind of overall, partial, and finally back to the overall analysis is an effective means of studying complex problems.

Literature analysis is to narrow down the scope of research according to the scope and hypothesis of research. Make the applicability analysis of the hypothesis, to find the gap in the research, and establish the theoretical framework of the whole research.

The case study method is used in the research process. Typical cases are used for the case study and qualitative research is taken as the main part. The findings can be targeted under the set goals. In the case analysis, combined with the literature, the single object is analyzed, and the law of generality and universality is obtained. The case study is suitable for the study of complex problems.

Theoretical deduction refers to the way of thinking that people deduce the unknown part of things based on the theory of certain objective laws. It is a process of cognition from general laws to special ones.

The workshop is also the main method of quantitative analysis. As an effective method to explore complex problems in a short period of time, workshops can bring together people from different regions and professional backgrounds to stimulate new ideas (Brooks-Harris & Stock-Ward, 1999). Using workshop as the research method, it is especially suitable for integrating the members of relevant disciplines of various projects and brainstorming to conceive exploratory creative schemes. Through the efficient organization of participants, quickly find divergent ideas, and then extract the core issues through abstraction, and implement them into the design sketches and reports. And it can effectively test the design report and get feedback. The research and design practice process of the workshop also helps members of different professional platforms to collide with each other.

Design practice is to use the established method in practical creation, to study the effectiveness of the method. At the same time, feedback and evaluation are obtained through the practice process, and the original method is improved and perfected. Design practice is a common research method in art and design discipline, and it includes many research models, such as practice-as-research, practice-based, practice-led, mixed-mode research practice and practice through research (Frayling, 1993). This research is a mixed-mode of practical research, practice in many aspects of the implementation of the research, to improve the self-evaluation of each stage, and verify the co-creation in the final evaluation stage. The practice also includes field investigation, interview and other methods. In the evaluation stage, practice is the basis of research.

3.2.2 Framework

The whole research is carried out by participatory action research. The core of each step is the research objectives. In the literature review and case study, the objective of analyzing co-creation in the surface decoration of old buildings is solved. The outcome is that art intervention is adopted as the decoration method. The second objective is the core of the study, which adopts a multi-round research

process for complex problems (Figure 36). To achieve the objective of creating co-creation method to realize the art intervention in the old building surface decoration, the research steps of three workshops are formulated. Setting up a Chinatown workshop in Bangkok to solve the problem of what art form is used to realize co-creation and achieve the research sub-objective of to select art form to realize co creation, the expected outcome is to get the artistic expression. Set San Frediano in Cestello workshop in Florence, solve the problem of how to transform art into a decoration for co-creation, and achieve the sub-objective of developing art transform into a decoration for co-creation. The expected outcome t is to get an abstract expression. The sub-objective of evaluating the co-creation method with residents is achieved by setting the focus of the Chongqing co-creation workshop and solving the problem of how to organize co-creation with residents. The expected outcome is the specific principle and implementation method of material selection and combination. Finally, in the design practice, the objective of testing the co-creation method in Chongqing Xiaohao street is realized. (Figure 37)

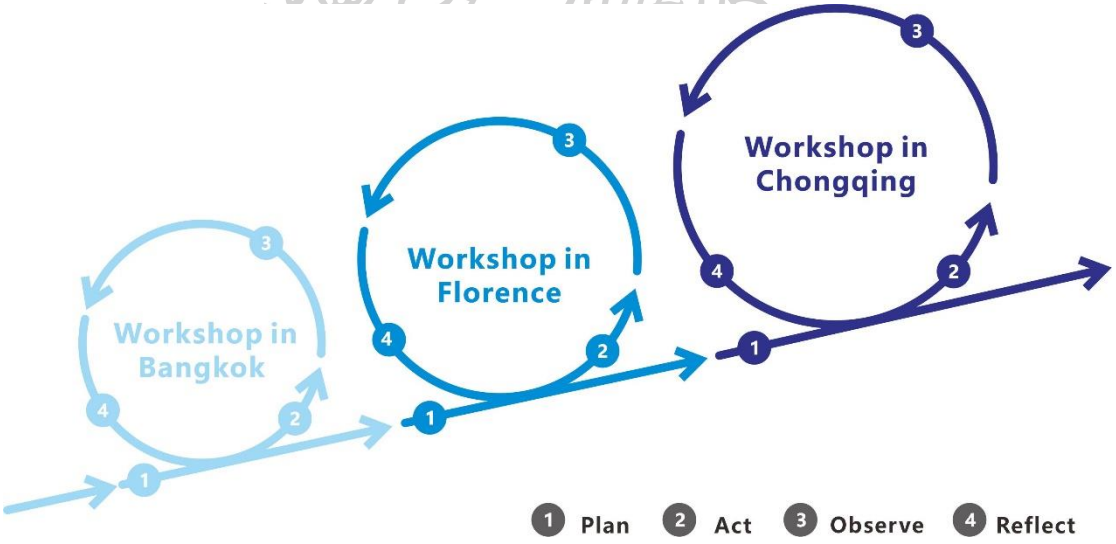

Figure 36. Methodology Framwork

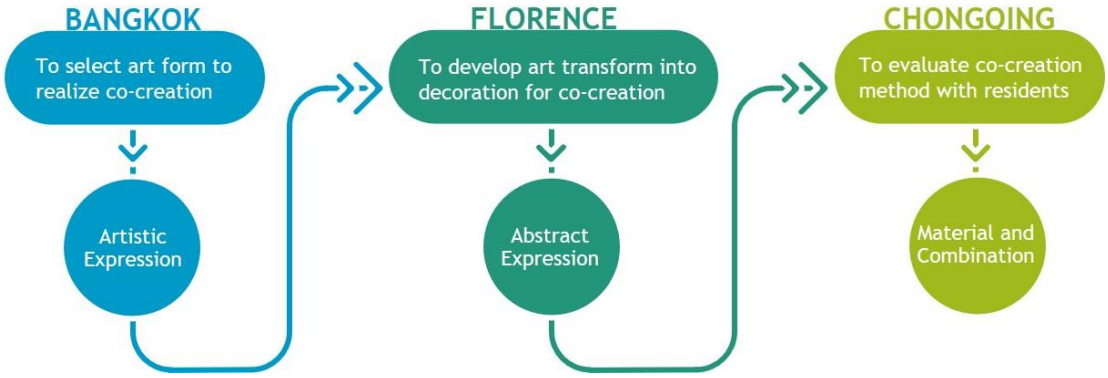

Figure 37. Sub-objectives and Expected Outcomes

3.3 Research Process in Participatory Action Research

The whole research process is based on the three elements of PAR (Participatory, Action, Research) as the theoretical framework and the four steps of PAR (Plan, Act, Observe, Reflect) as the basic process of the workshop. The outcomes of each step are verified, expanded and deepened in the next step.

3.3.1 To Select Art Form to Realize Co-creation

The method of the workshop is mainly used, and the method of field investigation and practice is also used. The problem of what art form is used to realize co-creation is solved, and the goal of selecting art form to realize co-creation is realized. The outcome is in the form of collage art, Three days workshop was held. Through the collection and collation of a large number of pictures, this paper redefines the definition of new buildings and old buildings in the current city. Finally, collage art is used to complete the art creation. Among them, the stakeholders are the community self-help managers in the Chinatown, who are responsible for formulating the theme of the workshop. (Figure 38)

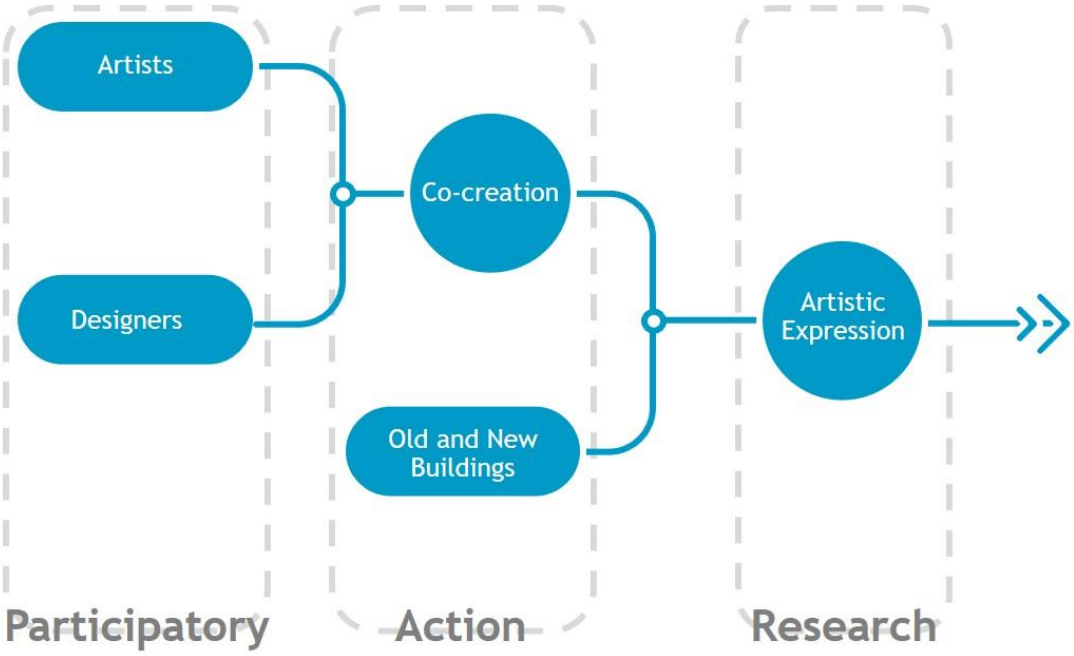

Figure 38. Framework of Workshop in Bangkok

3.3.2 To Develop Art Transform into Decoration for Co-creation

The method of the workshop is mainly used, and the method of field investigation and practice is also used. The problem of how to transform art into decoration for co-creation is solved, and the goal of developing art transform into decoration for co-creation is realized. The result is an abstract method. Taking San Frediano in Cestello, Florence, Italy as the site of the workshop, and some students from Thailand University of art, Florence Academy of fine arts and Florence Institute of architecture as members, the workshop lasted for 10 days with the theme of exploring the modern artistic expression of historical buildings. Through the investigation of the surrounding environment of the church and the collection of materials, the image of the old city is abstracted into symbols, which constitute the decorative pattern of the building skin and are displayed in the facade of the church by projection. Among them, the stakeholders are the organizers of government departments and relevant schools, who are responsible for formulating the theme and restrictions of the workshop. (Figure 39)

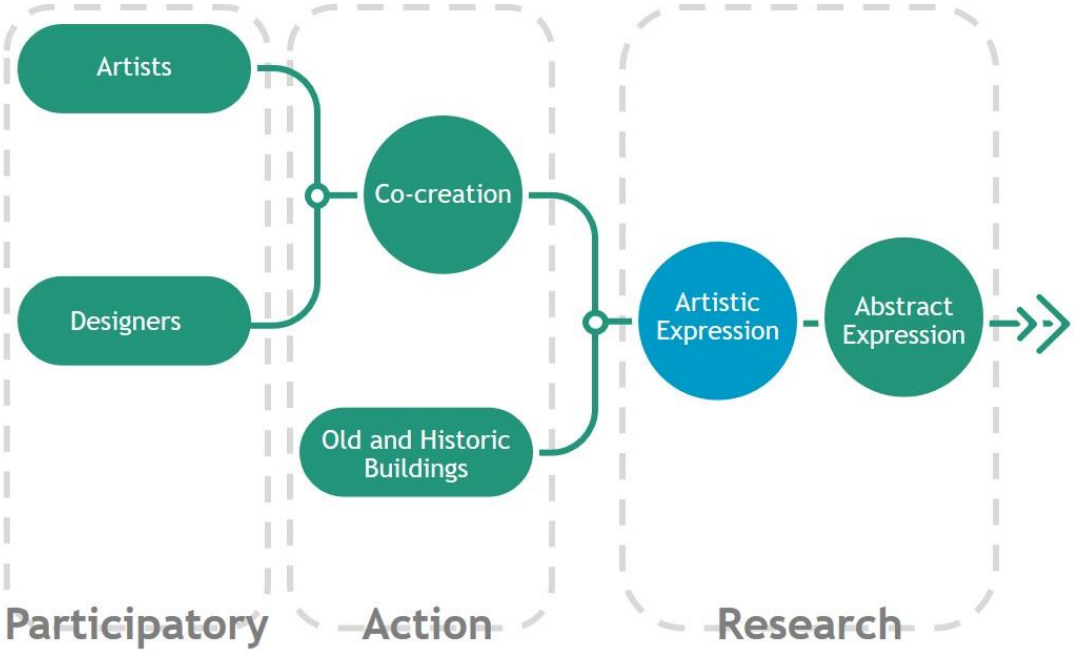

Figure 39. Framework of Workshop in Florence

3.3.3 To Evaluate Co-creation Method with Residents

The main method is the workshop, and the methods of participation design and interview feedback are used. The problem of how to organize co-creation with residents is solved, and the goal of evaluating co-creation method with residents is realized. The result is the method and principle of organization cooperation design. Taking a community in Chongqing as the workshop site, some students of Chongqing Institute of architecture and some residents of the community as members, the workshop lasted for 6 days. The workshop is divided into two stages. The first stage uses basic design principles and design elements to teach students to organize design. The second stage is co-creation between students and residents. It focuses on the educational significance of the use of non-conventional materials and basic design composition to residents. Among them, residents are the stakeholders, and students are the collaborators to provide maximum assistance. (Figure 40)

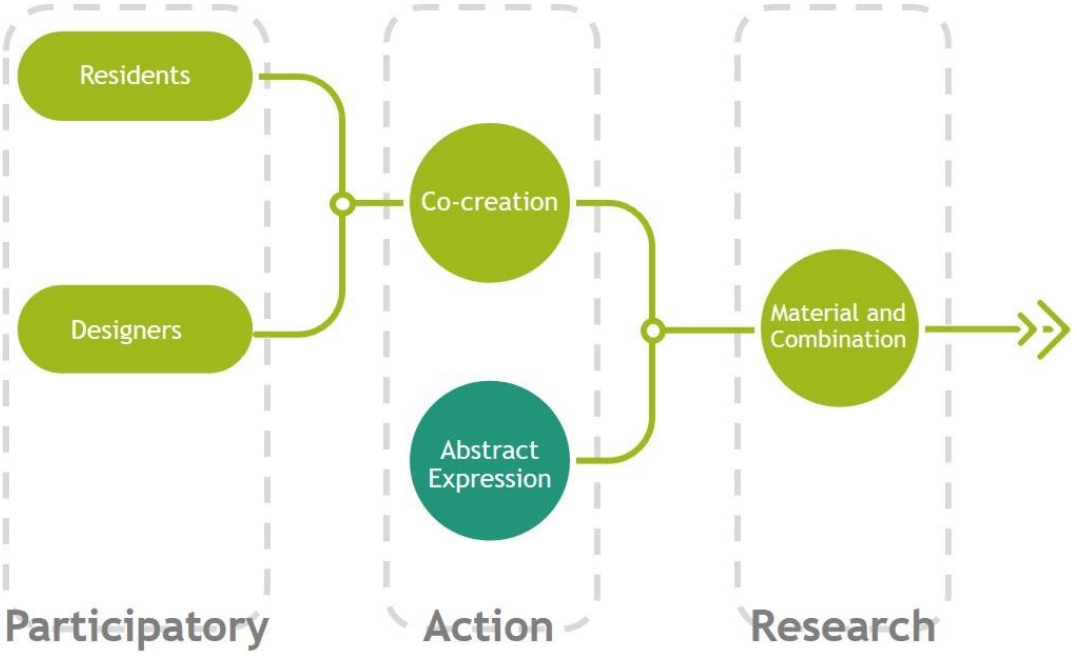

Figure 40. Famework of Workshop in Chongqing

Chapter 4 Workshop for Co-creation

Three workshops were set up to create co-creation method to realize the art intervention in the old building surface decoration. To select art form to realize co-creation is realized in Chinatown workshop in Bangkok; to develop art transform into decoration for co-creation with San Frediano in Cestello project workshop in Florence; to evaluate co-creation method with residence is realized by Chongqing residents' co-creation workshop.

4.1 Workshop in Bangkok for Artistic Expression

Exploring the relationship between modern and old buildings is a dynamic social issue that no single architectural design approach can address. The workshop's goal is to determine the construction pattern of new buildings in the city's old districts using data study and quantitative analysis, as well as a new description of old and new buildings in the city.

4.1.1 Plan

The workshop consists of students from Silpakorn University and Tokyo University of Art, including 1 Thai, 1 Chinese and 2 Japanese. The group's headquarters are Yaowarat Road and Charoen Krung Road of Chinatown in Bangkok. (Figure 41)

Figure 41. Information on Workshop

They collect architectural images, traditional objects, and local symbols and patterns in this section. Analyzes of photographs and screenings, followed by college art production to investigate the possibility of the old street's growth, as well as the process of thought and reasoning to round out the summary. Collage art, as a common medium of expression and a technical means of popular art, can combine the transformation of two-dimensional surface and three-dimensional space, resulting in a more expressive work (Pierce, 2015). It is used as an expression form of art interference in the combination of new and old buildings in this case. It satisfies the requirements for participants from various backgrounds to participate in the workshop. It's also a popular teaching and workshop activity method in architecture (Shields, 2014).

The photo data was subjected to two sample screening processes during the data collection process with Thailand Chinatown as the sample object. To photograph representative buildings and scenes in the district for the first time, the workshop team members would use the redefinition of old and new buildings as the principle of data collection. The final core data was collected the second time by rescreening other people's photo data. This is the central factor that can better reflect the characteristics of the district under the restricted conditions of this small-scale and short-term workshop project. Finally, in the definition of new and old buildings, the amount of photo data from the core elements is combined. The relationship between old and new buildings is observed and evaluated using the data ratio, and the paradigm shift of new buildings in old districts is calculated.

4.1.2 Act

The addition of new structures to the cityscape is an unavoidable reality. The key point for the city to explore its development path is to balance the relationship between new buildings and old districts. With a 200-year tradition, Yaowarat Road and Charoen Krung Road used to be the commercial hub of Bangkok, but with new business growth and migration out of the CBD, Chinatown has slowly faded away. Sampang Lane, Yaowarat Road, Charoen Krung Road, and other streets link the Chinatown district, which is about two kilometers long. Due to the passage of time, this area now includes a Chinese, Indian, and Muslim assembly area. The

majority of the structures in this area are old, but the company is thriving. Although the majority of the structures are in the Chaoshan region of China, we can see the convergence and change of various cultures. (Figure 42)

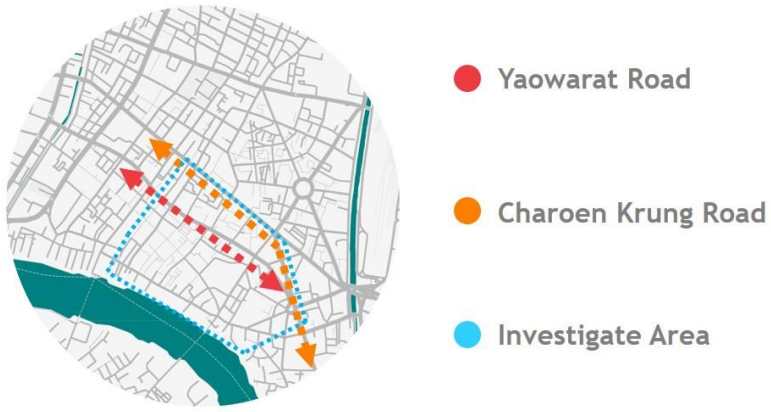

Figure 42. Investigate Area in Chinatown of Bangkok

To better understand the relationship between old and new buildings in the city, a new concept of new and old buildings is needed. Based on realistic analysis, this concept is based on existing buildings in Bangkok's Chinatown district. (Figure 43)

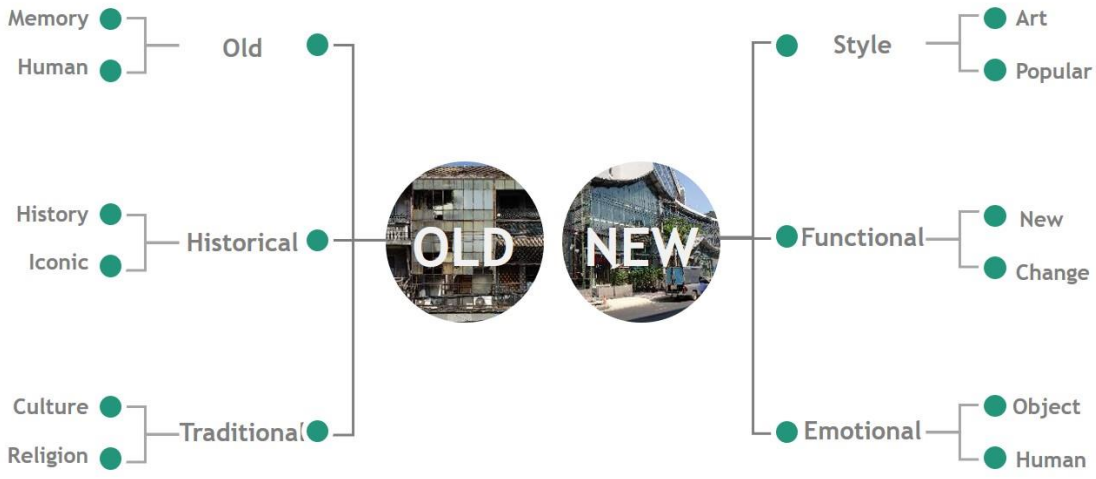

Figure 43. Categories of the Old and New

Twelve types of elements are summarized based on observations of the city's old and new features, and focused research is performed on the region Thai Chinatown, with related photos and materials collected. The collage art is made according to the following principles based on this information: (Figure 44, 45)

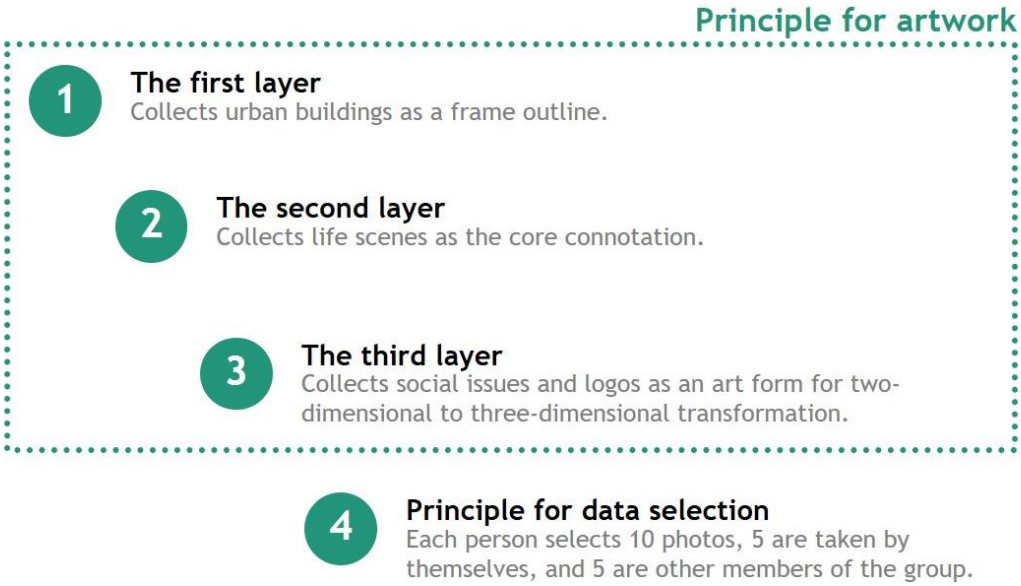

Figure 44. Principles of Workshop Picture Collection

1). Collect the shape of urban buildings as the outline of artistic creation;

2). Collect the living details of residents as the connection node between the city and people;

3). Collect social phenomena and physical symbols as a way to transform two-dimensional art into three-dimensional art; and

4). In data selection, select 5 photos taken by yourself and 5 photos not taken by yourself as creation materials.

Figure 45. The Process of Workshop

4.1.3 Observe

Old buildings. Old buildings are the main part of the urban buildings, and they are also included in the following data analyses. Old buildings encompass two meanings, one is memory and the other is humanization. Objects all go through the process of becoming old, and the memory created in this process is what gives old

urban buildings their special charm. This form of old has little to do with conventional culture, but rather with the relationship that exists between the residents and the structure itself. Humanization has these features as well. The old buildings have been adapted to represent low-cost humanistic care in response to the urgent needs of users. This isn't just the designer's words on paper; it's also the external manifestation of life's traces. (Figure 46)

Figure 46. Elements of Old Buildings in Old

Historic buildings. The city's architecture reflects the city's heritage, which is also a key feature that distinguishes Bangkok from other cities. There are two types of historicity: one is a building of historical significance, which is usually an existing building or an old building that has been restored. It is a sentimental item and a witness to a specific time in history. The other is a listed structure, or as we like to call it, a symbol. This sign is a representation of the city's emblem and image. It may be the city's spiritual supply and restoration following the loss of historical structures. (Figure 47)

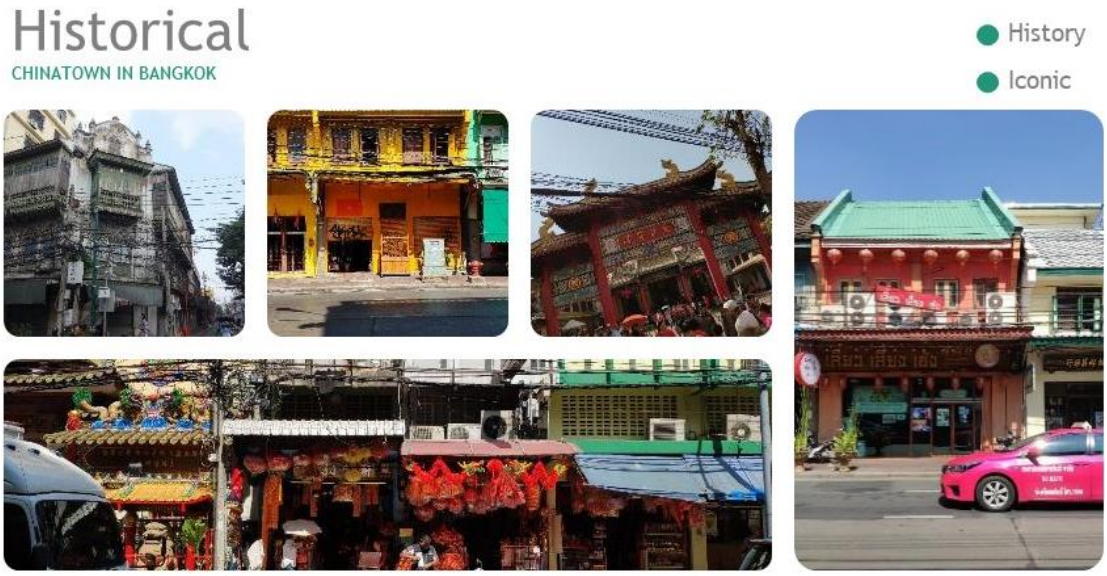

Figure 47. Elements of Historic Buildings in Old

Traditional architecture. Cultural and religious traditions are incorporated into traditional architecture. The foundation for sustaining a near form of regional culture is cultural tradition. Traditional markets and Chinese schools, for example, exist in Bangkok's Chinatown, and they serve as meeting places for the traditional community. The importance of religious tradition is best known. A significant number of temples, Hindu temples, and mosques are carriers of Bangkok's Chinatown's unique culture, bringing together various ethnic groups in the process of mutual integration and preservation of their unique spaces. (Figure 48)

Figure 48. Elements of Traditional Architecture in Old

New buildings in style. The popularity of new architecture in style involves the language of modern art. Square box architecture has been the main body of architectural creation in the world since the beginning of modern architecture, and post-modern architecture is often focused on modern architecture to incorporate modifications to make architecture more meaningful. As a result, the design of this new structure has become a pattern and an unavoidable theme. Furthermore, the building's surface is being adorned with an increasing number of art elements. The distinction between art and the trend that has been left behind can often be blurred, implying that the artistic surface type is also the building's common trend. (Figure 49)

Figure 49. Elements of New Buildings in Style

New buildings in function. The social division of labor becomes more detailed as human society grows, and the resulting new group roles give rise to buildings with new functions. For example, there was no such thing as a super-sized shopping mall in the previous community, which is what the building under the new functions is. The buildings, on the other hand, would gradually replace the obsolete building functions during the new function process. Perhaps the traditional market has been converted into a supermarket, in which case the new functions include new functional buildings as well as buildings that alter their usage functions. (Figure 50)

Figure 50. Elements of New Buildings in Function

New buildings in emotion. Emotional new construction is the construction of a new structure in the hopes of preserving the traditional emotional supply; it has no historical meaning, and it simply incorporates emotional symbols into the new structure. This symbol has two interpretations. To begin with, it is focused on artifacts, such as the addition of a traditional attic to contemporary architecture, which is both out of place and grotesque. Second, buildings without human feelings are always dead, so graffiti and other techniques are used to give them human feelings. (Figure 51)

Figure 51. Elements of New Buildings in Emotion

4.1.4 Reflect

The number of images defined as old buildings is large, accounting for 70% of the images in the selection of old architectural elements; the number of images of historic buildings is 30%; and the number of images of traditional buildings is 50%, according to quantitative analysis of images selected from a small area. The number of images defined as new form is 50%; the number of images defined as new feature is 30%; and the number of new architectural images in emotion is 70% in the selection of new architectural elements. The picture elements gathered from the above data are added together and estimated. There are 40 valid data images to choose from, which are chosen by the workshop participants. Finally, they are artistically crafted and presented as collage art in the context of modern urban life, resembling Bangkok's Chinatown city. (Figure 52)

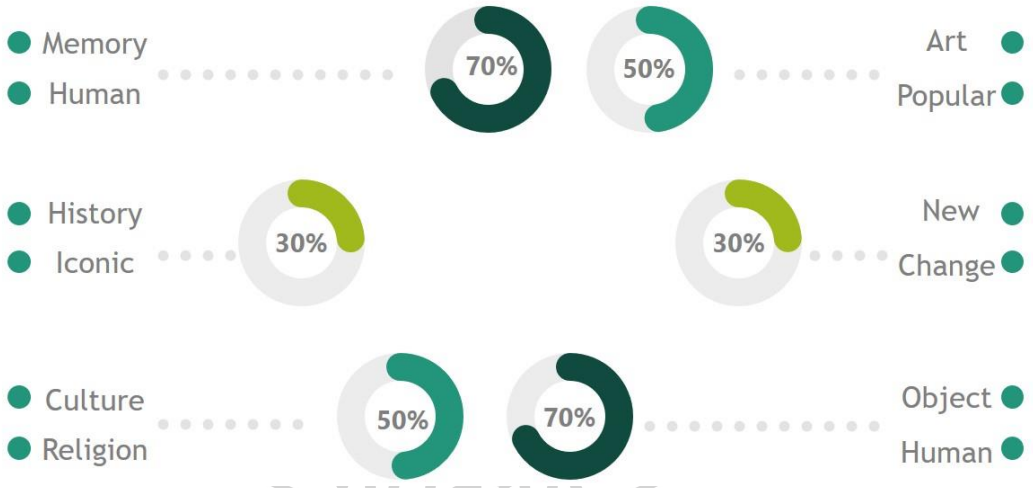

Figure 52. Data Analyses

According to the final data, the number of old buildings created by the aging of the building itself is the highest, making it the most urgent part of the district to be updated, especially because some buildings are aging and abandoned due to long-term decay. The demand for human emotion is highest in new buildings in urban renewal. The nostalgic action of old buildings is an example of this type of emotion. It does not always refer to a specific architectural style, but it does have a collection of emotional requirements for the emotional building materials that describe human feelings in enclosed spaces. (Figure 53)

Figure 53. Finding

The method of inquiry, data collection, data classification, and art production is used to investigate the city districts through the path of the art workshop. We will discover that in the construction of new buildings in urban areas, human emotional factors are the main deciding node, the node between new buildings and old buildings, and the key to the paradigm shift from new buildings to old urban districts, by using perceptual artistic formation to understand the relationship between new buildings and old buildings in urban districts. (Figure 54, 55)

Figure 54. Collage Artwork 1

Figure 55. Collage Artwork 2

4.2 Workshop in Florence for Abstract Expression

The workshop of San Frediano in Cestello, Florence, Italy, explores the possibility of surface reconstruction of historical buildings, the endowment of historical buildings with a new urban culture, and activation of urban streets by historical buildings. The conclusion is that temporary appendages can be arranged on the architectural surface, which is one of the methods to achieve the overlapping of urban culture and historical buildings. Art is a way of returning human emotions. This study explores the method of obtaining concrete patterns and abstract symbols and applying them to the material of architectural surface expression. The reported scheme is completed through data analysis and design, and the feasibility of using the workshop as a design method is verified.

4.2.1 Plan

The protection, maintenance, and reuse of historical buildings are controlled in the transformation without damaging the original architectural cultural environment. historical buildings have always maintained the principle of repairing the old as the old, deliberately restoring the original historical traces. The reuse of historical buildings, especially the reuse of industrial historical buildings, has become

the mainstream of urban historical buildings renewal. A large number of industrial buildings such as factories and workshops have been transformed into modern commercial space. This can not only preserve the cultural history of the city but also reduce the waste of resources. However, this way of reconstruction and restoration will make the urban blocks present a homogenization phenomenon. Limited to the transformation of internal space, retaining the original state of the building surface may be a way to preserve the characteristics of urban areas, and appropriate reconstruction of the external surface of the building is a new method that the workshop wants to try. As an experimental brainstorming method, the art workshop aims to explore more possibilities for the renewal of the surface of historical buildings.

The reconstruction and renewal of building facade is the main method of urban renewal and development, but it is mainly used in urban old buildings. The facade of historical buildings is a restorative transformation to restore the appearance of historical buildings before. We can try to find principles and methods from the renewal of the surface of old buildings. The facade reconstruction of old buildings is a process of redesigning the original building facade through the composition, proportion, material, form, and other aspects. There are usually two ways: the first is the method of comparison, which shows the separation of the new construction and the original building, and strengthens the texture and characteristics of the times of the original building; the second is a similar method, which shows the integration of the new construction and the original building, and creates the reappearance of the historical style.

In the elevation renewal of historical buildings, the principle of similarity is generally used, and more strict materials are used to achieve complete restoration of historical features. The principle of contrast is usually easy to have a destructive impact on historical buildings, which may damage the original style and features, or psychological differences between the original buildings. This workshop is for experimental discussion, using a suitable design method to give the original historical buildings new elements and highlight the historical texture of buildings.

The operation of the workshop includes the investigation stage, question raising stage, brainstorming stage, idea classification, and improvement stage, design, and implementation stage. From November 18th to November 27th, 2019, a total of 10 days. Ten days workshop was held in Florence, Italy, jointly by the three schools. Among them, there are three students from Silpakorn University, one from Accademia Di Belle arti di Firenze, and one from Universit à degli studi di Firenze. The major covers visual art, handicraft art, architecture, environmental art, and other art and design disciplines. The purpose of the workshop is to activate the district through the treatment of historic buildings on the outskirts of Florence's old city.Ten days of workshop arrangement, the first and second days for expert lectures and field research; the third day for group discussion, questions, to determine the design objectives; the fourth day for brainstorming and creative improvement, team members from their professional point of view, put forward the scheme and classified to improve ideas; the fifth, sixth, seventh day is the project scheme design, using a variety of expression techniques to improve and determine the scheme; the eighth and ninth day Complete the plan, integrate the team report, consult experts, get feedback and revise; finish the report and Exhibition on the 10th day. (Figure 56)

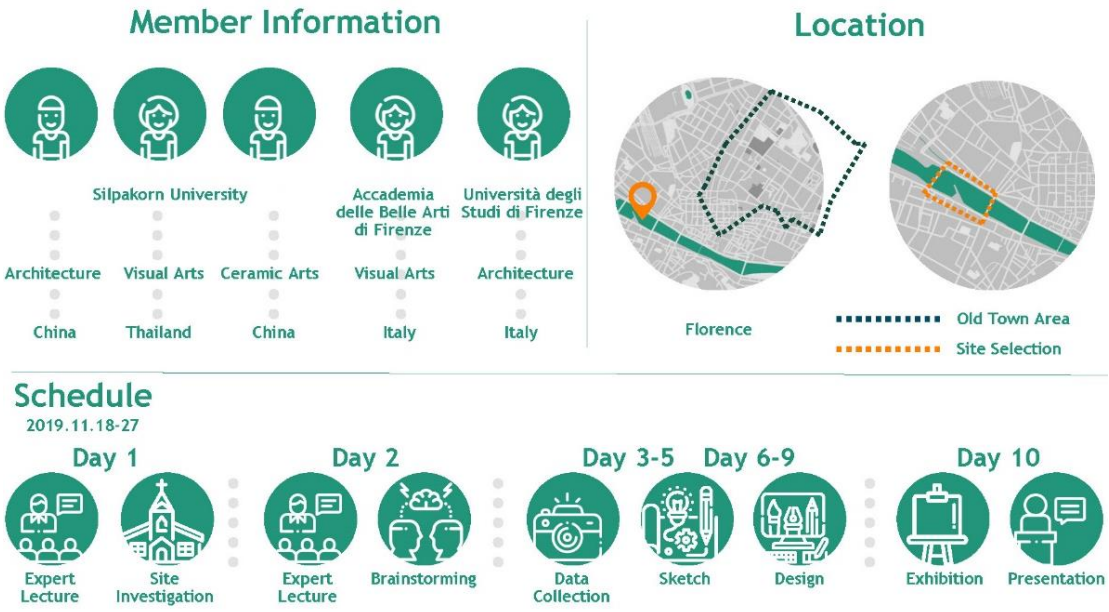

Figure 56. Information on Workshop

4.2.2 Act

The project is located in the periphery of the old city of Florence, which is far away from the main tourist attractions of the city, so it is a local activity area. This area is in the middle of the two main roads, and the street itself has no special focus of attention, so it has become an area that local people seldom pay attention to. The square area is concave space, and the characteristic residential buildings cannot be displayed outside. And the church building with commanding height, because the building facade is not completed, so there is no decoration, does not have the effect of attracting people's attention.

San Frediano in Cestello is a baroque style, Roman Catholic Church in the Oltrarno section of Florence, region of Tuscany, Italy. In Florence, there are also Basilica di San Lorenzo, a wooden facade model designed by Michelangelo, but the construction has not been completed. There are also no historical traces on the facade of Renaissance buildings. According to Michelangelo's original design model, the reconstruction project plans to project the image onto the external wall for verification, but there is no conclusion. San Frediano in Cestello is also in the same situation. From the perspective of respecting historical buildings, there is no modification of the facade of the building. However, the building itself can not represent the style and characteristics of that era. As an unfinished building, it is more like recording the process of an era. Comparing the two churches of completely different ages, we find that there is no difference between the basic facade of the Renaissance church and that of the baroque church. To add decorative materials to the facade in the later stage, the basic structure of the facade of the two churches presents uneven texture patterns, and local holes are set to facilitate the fixation of stone on the facade. Respect the appearance characteristics of historical buildings, try to add decorative elements representing that era on the plain basic structure facade, or add decorative elements with urban characteristics, representing contemporary technology and culture. On the premise of not destroying the facade of original historical buildings, it is a positive attempt to let ordinary people know more about the history and development of such buildings and explore the expression techniques of contemporary art and design. (Figure 57)

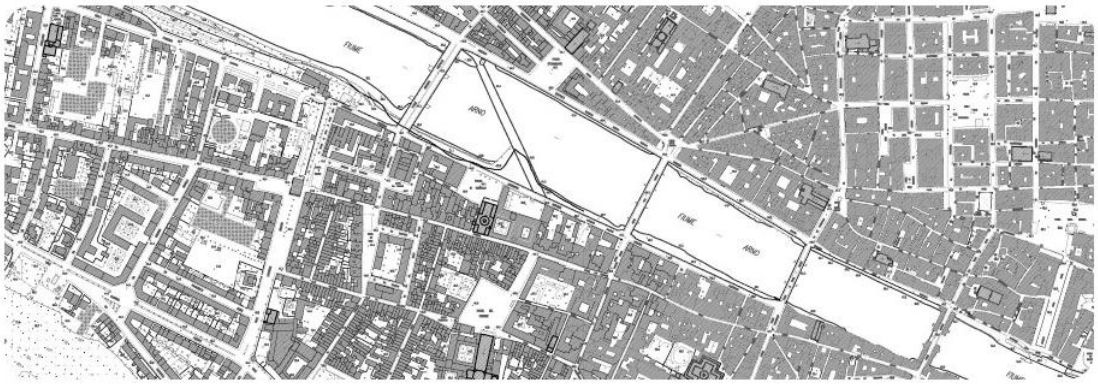

Figure 57. The Map of Site

The purpose of the project was to attract attention and attract people to the area, so data collection was carried out on the church and its surroundings. Around the Arno River area, Ponte Amerigo Vespucci and Ponte alla carraia bridges are taken as the main moving lines of human beings, and the dam is taken as the main characteristic focus. The Ponte Amerigo Vespucci to Ponte alla carraia bridge is defined, and the facade materials of buildings along the Arno River are collected and analyzed. It focuses on the location of the church, taking people's sight as the consideration, and thinking about how to attract the attention of residents as the main purpose. At the same time, it can stimulate the curiosity of deep tourists, so that they can also go out of the old city and explore new areas. (Figure 58, 59)

Figure 58. Facade of Arno River

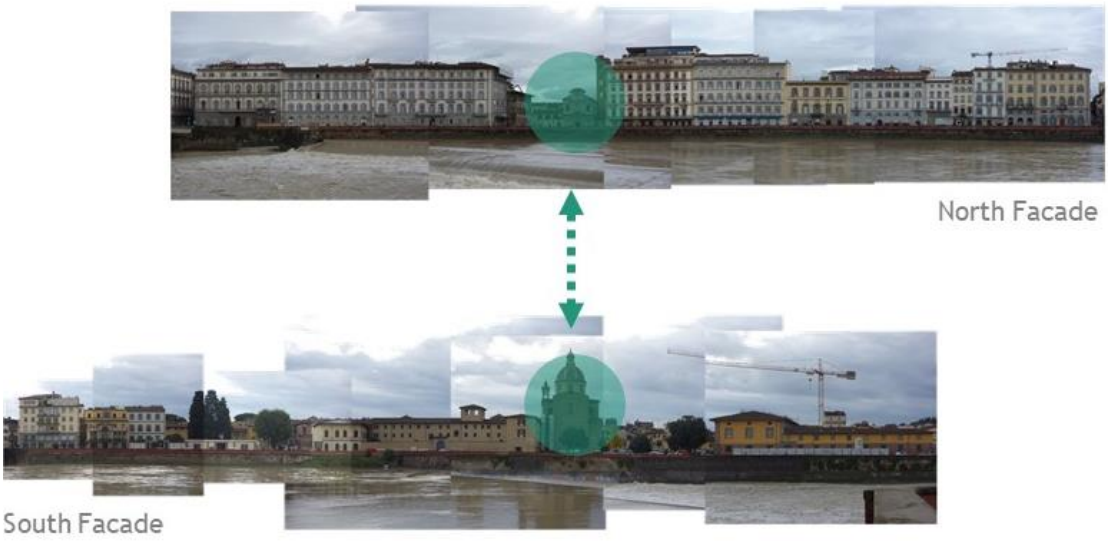

Figure 59. Face to Face of Two Churchs

First of all, mark the visual starting point of the two bridges. The church is the highest visual point of this area. However, the church itself is in a small concave square. Therefore, it is a means to attract attention to add some contemporary installation works with strong art intervention expression as temporary attachments on the church surface. Create two visual lines from Ponte Amerigo Vespucci and Ponte alla Carraia to the church. In particular, Ponte alla Carraia bridge head and Piazza Carlo Goldoni area with large traffic flow is taken as the starting points of the visual line. (Figure 60, 61)

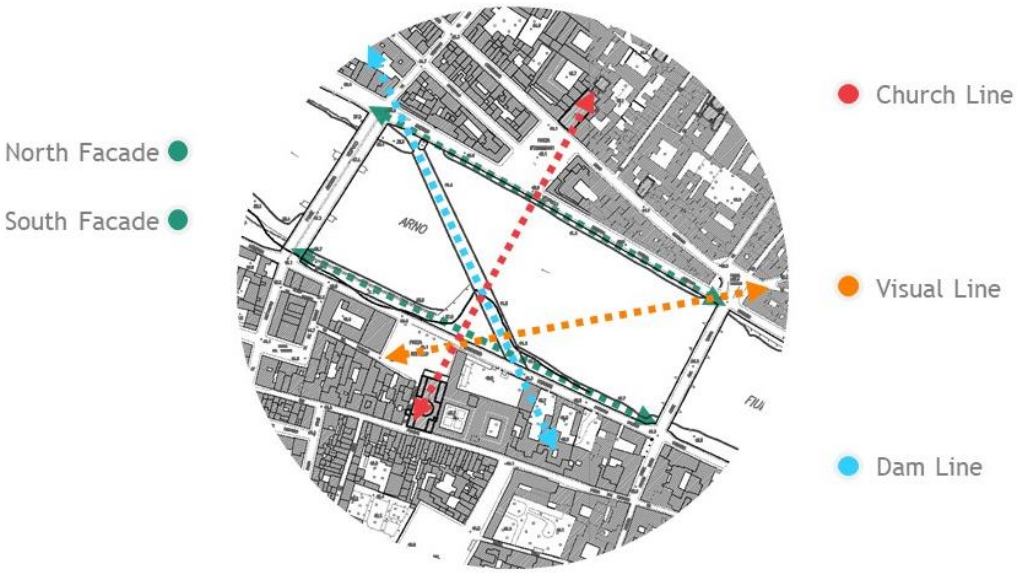

Figure 60. Three Lines Concept

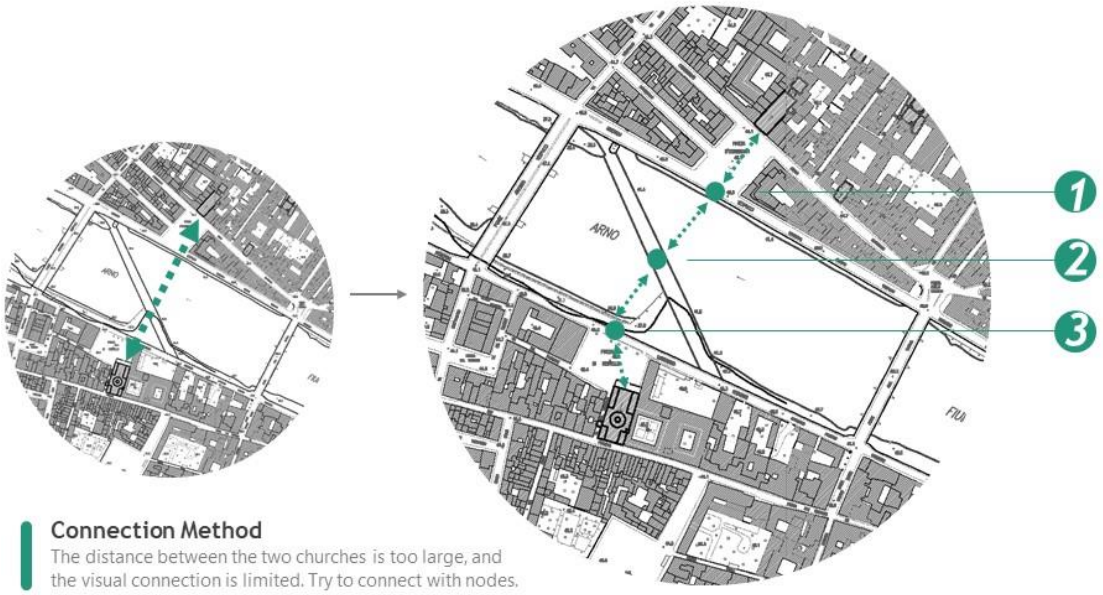

Figure 61. Connect Two Churches

Pescaia di Santa Rosa is an important facility for residents to integrate into the church area. Expand the role of the dam, as the design of residents' activity lines, constitute the dam line, can be naturally integrated into the environment, but also has the role of attracting people. (Figure 62)

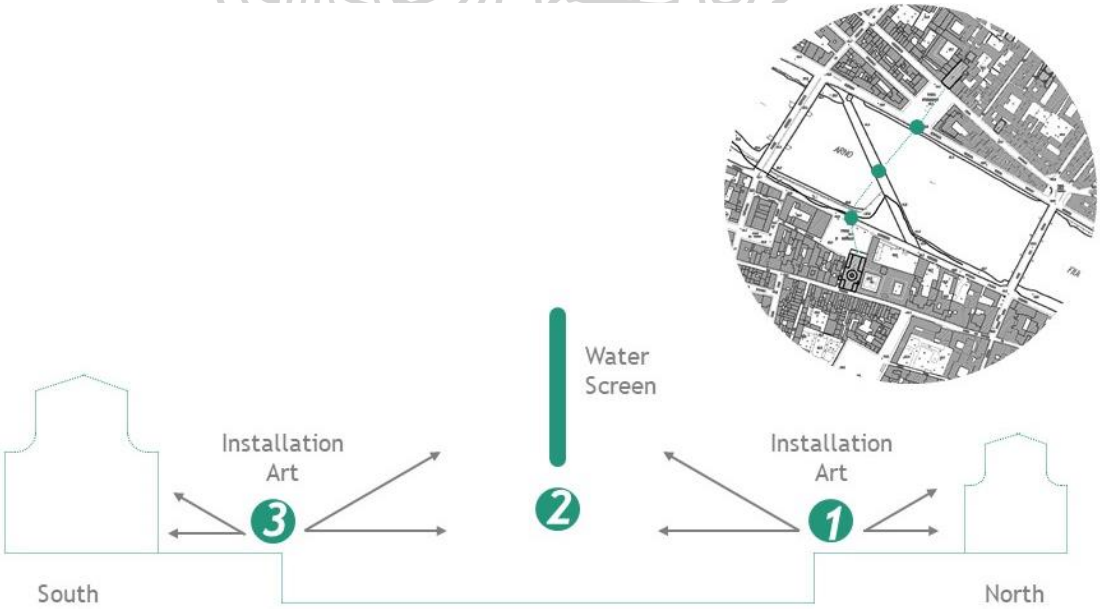

Figure 62. Concept Design

The last and most important part is the church element. Through data collection, the buildings along the riverbank just show that San Frediano in Cestello

church on the south bank and San Salvatore in Ognissanti church on the north bank are face-to-face. However, the volume of the two churches is relatively small, which is easy to be submerged in the surrounding buildings. In this study, we try to enlarge the coincidence and make the two church facades overlap in space through the way of intermediate point conversion. With the help of modern visual projection technology, the magic effect of the night is created. (Figure 63)

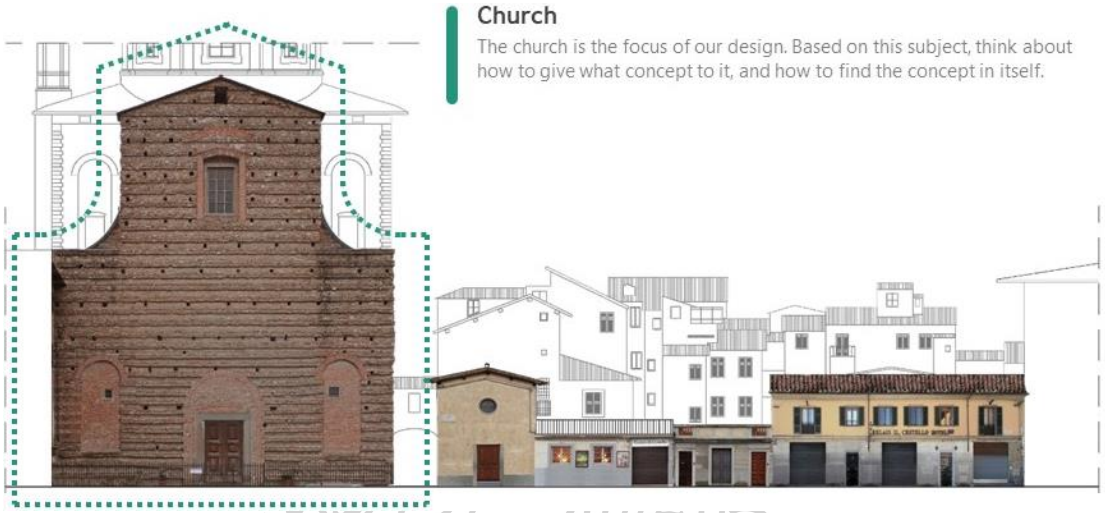

Figure 63. Church Facade Analysis

4.2.3 Observe

The above three design lines, like creating three virtual bridges for this area, cross the Arlo River, and connect the old city with this new area. The church itself is a historical protection building, but its facade design has not been completed, showing the simplicity of basic materials, which is not enough to attract people's attention. By adding temporary installation works of art and visual projection, the old building is endowed with new elements. How are the new elements collected and abstracted into symbolic language?

Through the way of data image collection, the workshop team collected data from the old city of Florence. In the collected photos, the representative buildings, sculptures, flags, totems, and other elements are selected, and then the concrete photos are abstracted into simple strokes by the way of simple brush painting, and the symbolic language with urban characteristics is extracted through simple art intervention transformation. These symbolic elements can be used as the

elements of the later church facade design so that the new art and design works have traces of urban culture. (Figure 64, 65, 66, 67)

Figure 64. City Element Collection

Figure 65. Elements Art Abstract

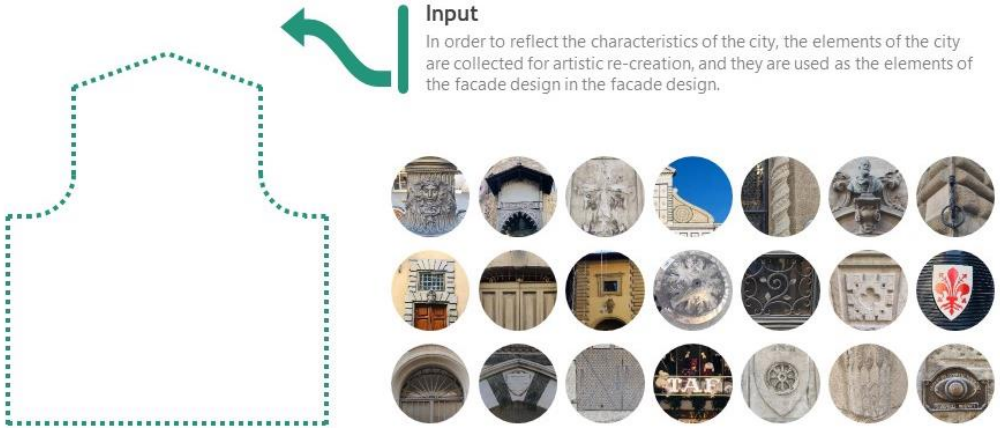

Figure 66. Elements Input to The Church Facade

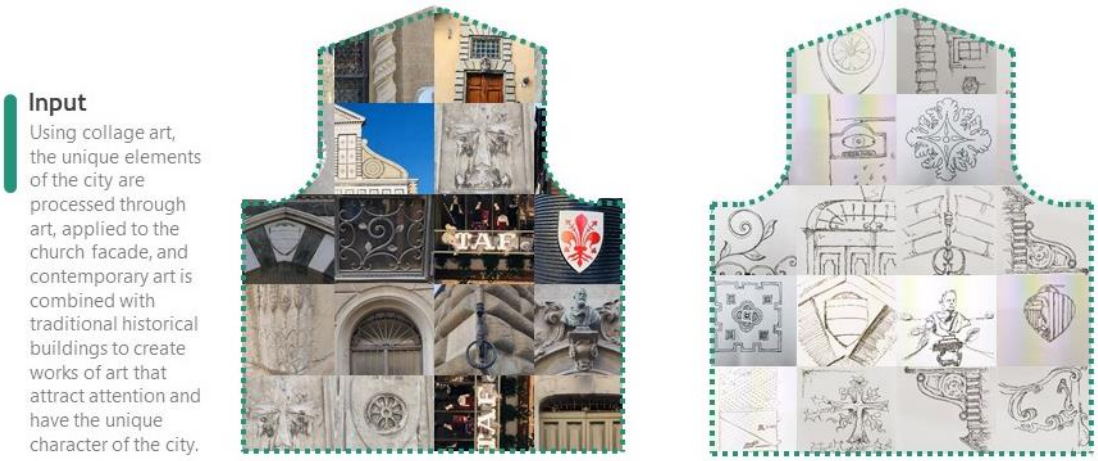

Figure 67. Church Facade Rendering

Experimental use of urban cultural symbols of the performance elements projected on the simple church facade, church facade surface relatively no decoration, just the natural curtain for image projection. This is just an experimental attempt. In the process of trying, we may have new ideas on the expression form of these symbols in the facade, carry out an optimized design combination, and explore the coexistence mode of new design and original building facade. (Figure 68, 69)

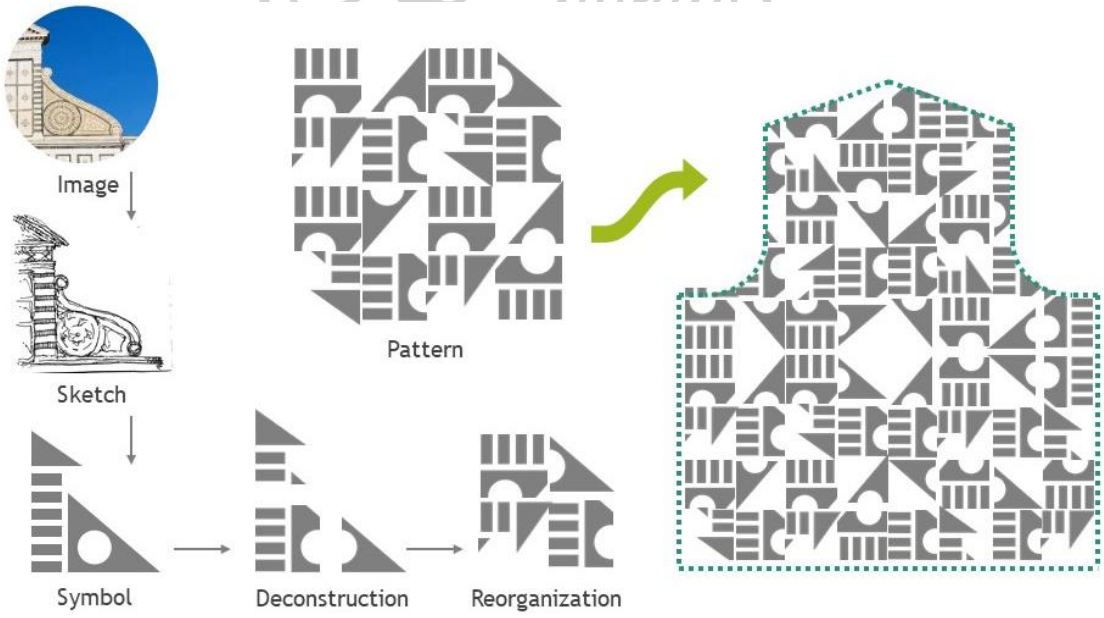

Figure 68. Image Abstraction Process

Figure 69. Application of Pattern

4.2.4 Reflect

Through the above steps, the workshop is used as the methodology to explore the differential renewal of historical building surface. To solve the existing historical building facade although has historical value, but does not conform to the modern aesthetic reality. The restoration of the original appearance of historical buildings is only at present, and the technical conditions cannot reach or even surpass the technical means of original appearance restoration. And people's public aesthetic is also more inclined to the integration of new buildings and old buildings, for the design of differentiation, more stay in the art intervention temporary installation works. However, art attempts to prepare for the future design update. What we can know is that more and more old buildings have given the old buildings new functions and appearance through the differentiated facade transformation. The surface renewal of historical buildings will be more careful and meticulous. The concrete images will be used to express the abstract symbols. The urban texture and human feelings will be taken as the symbol basis for creation. This provides a method for the future implementation of the facade renewal of historical buildings. (Figure 70, 71)

Figure 70. The Process of Workshop

Figure 71. Investigation and Exhibition

4.3 Workshop in Chongqing for Material and Combination

In the eyes of artists, the local self-improvement mode of residents is a post-modern creation. Through the refinement of art, this kind of creation can be limited to a smaller scope. Under the guidance of designers, the principles and methods of design combination are adopted to combine the raw materials of residents' creation, to complete the transformation from artworks to design works. In achieving the collaboration from the residents to effectively participate in the improvement of the living environment, the process of functional transformation, has to achieve the purpose of environmental beautification.

4.3.1 Plan

In the way of workshop cooperative design, the modular framework is artistically created and combined with the design principles, the transformation from artistic to designable is completed. The workshop is an effective way to integrate different groups for cooperative design, which can expand design thinking and explore greater possibilities in design. In the first stage, starting from the change of the basic form, using paper as the creation medium, and from Unit Feature and

Change Rule, the workshop was set up as members of design major students and residents. In the second stage, non-conventional materials are used as elements for composition exercises; in the third stage, linear, face, and block materials are used for limited art intervention creation.

Workshop: There are 15 members in the workshop, which are combined according to the mode of three people in a group. Two members of the group are design students and one member is community residents. The whole workshop lasted for 6 days. In the process, considering the actual situation of the residents, it appeared in the stage of material selection and material combination, and design students attended the whole process. Its significance is to realize the process of design professionals guiding ordinary residents' creative activities so that residents can enjoy the fun of design results, to improve the participation of residents. The schedule of the workshop is divided into three parts. The first link is students' learning of basic design knowledge and understanding of contemporary artworks and design practice works, and brainstorming to put forward ideas; the second link is to guide residents' design practice based on the existing materials of residents; the third link is project display and report. (Figure 72)

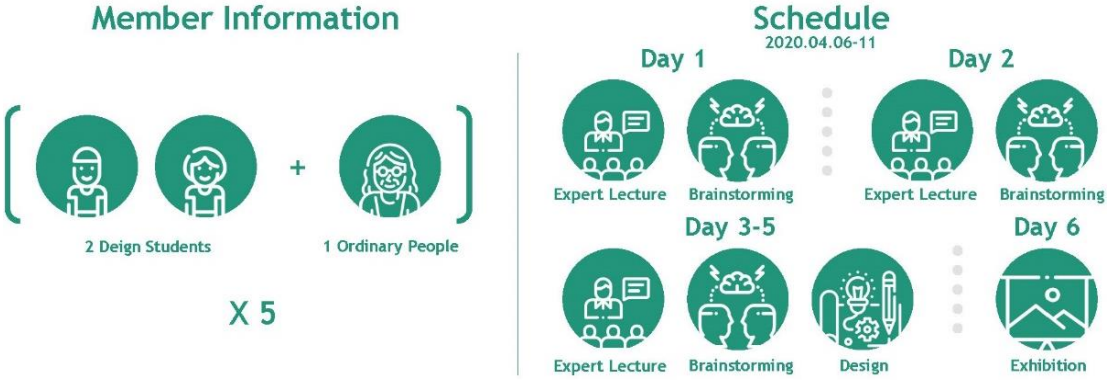

Figure 72. Information on Workshop and Curriculum Structure

4.3.2 Act

In the whole process of the workshop, there are two cores. The first is the short-term and effective training for the student population of project participants. This part is that the crowd is the core of the future project, which can be the residents who actively participate in the community, or the community

volunteers and managers. They are the key to the collaborative residents participating in co-creation. The second is to improve the enthusiasm of residents to participate in the project, and the ultimate goal is to cooperate with residents to complete the creation so that the real stakeholders can be happy in the creation and be satisfied after the completion of the works, which is the driving force for the project to truly realize the self-renewal in the later stage. (Figure 73)

Figure 73. Three Phase of Workshop

Phase I: Paper Deformation. The first step is to make students familiar with the shaping ability of material elements. Using ordinary white paper as a material, through folding, bending, kneading and other forms of paper, the paper can change its shape and form the most basic element unit, line, patch, and bulk. Take these basic elements as the basic unit, complete the first stage of training according to the arrangement of basic teaching types. This is different from an ordinary three-dimensional composition exercise. The goal is not to beautify the paper shape, but to seek the basic ability to process and combine the initial materials. Task arrangement: (Figure 74, 75)

1). Nine modular were designed in a square unit of 10 mm * 10 mm;

2). Use the most basic elements, lines, patches, and blocks to do three exercises;

3). In the process of combination, the arrangement form dominated by elements and the arrangement form dominated by logical relationship are used respectively;

4). In the process of combining elements of the same group type, try the combination of a single element and two elements; and

5). A4 can only be used as a base material.

Phase II: Non-conventional Materials. The second step is to stimulate students' ability to acquire non-conventional materials and to process materials into basic elements. Take the common objects in real life as the basic materials, and collect the materials according to the basic forms of lines, patches, and blocks. If the volume of a single material is overwhelmingly too large, the material can be decomposed into related small elements and then combined. Task arrangement: (Figure 74, 75)

1). Nine modular were designed in a square unit of 10 mm * 10 mm;

2). Use the most basic elements, lines, patches, and blocks to do three exercises;

3). In the process of combination, the arrangement form dominated by elements and the arrangement form dominated by logical relationship are used respectively;

4). In the process of element combination of the same group type, try to combine a single element and two-element respectively; and

5). Choose non-conventional materials such as food, utensils, plants, and waste garbage.

Phase III: Modular Elements. The third step is to verify the students' basic aesthetic judgment in short-term training and cooperate with residents to create the final modular elements. Two students cooperated with one community resident to complete the final creation, which verified the effectiveness of short-term learning on the ability training of community workers in the future, and the effectiveness of the trainers' cooperation with the residents without design ability. As the participants of the project, residents find out how to stimulate the enthusiasm of residents to participate in the project through the collaborative process. Task arrangement: (Figure 74, 75)

1). Complete a modular design in a 400mm * 800mm wooden frame;

2). Use one or two of the most basic elements, lines, patches, blocks to form a modular;

3). In the process of combination, the main focus should be on the arrangement and change of elements; and

4). Choose non-conventional materials in your life.

Figure 74. The Process of Students in the Workshop

Figure 75. The Process of Residents in the Workshop

4.3.3 Observe

The workshop discusses the art intervention creation process to the creation of architectural surface units. Urban architecture is an organic individual. When the building is completed, the residents will design and build the building for the second time according to their personal needs. This second creation integrates the feelings of the residents. As time goes on, the building is endowed with history, and the trace of time is particularly prominent in the architectural appearance or surface. The real building is the original building, plus historical factors, plus human emotional factors, while the reality is the disordered transformation mode of residents, which destroys the original texture of the city on the premise of meeting the first demand of function. Installation art discusses “Material + Site + Emotion”. It

tries to create an architectural surface in an art intervention way. Within the limited scope, guided by the basic aesthetic principles of design, the creation of a small modular surface unit is completed. Because it is completed in a unified design framework, the local differences will not affect the overall environment, but the local differences in the unified environment will make the building unique, which is a part of the buildings completed by the residents themselves. (Figure 76, 77)

Figure 76. Co-creation Artworks

Figure 77. The Process of the Workshop

4.3.4 Reflect

The number of participants in the whole cooperative workshop project is 15, of which three residents and five students are selected as the interviewees. Interview questions:

1.) Why do you come to the co-creation workshop?

2.) Have you ever participated in a similar co-creation workshop before?

3.) What do you think is the greatest pleasure in the process of the workshop?

4.) What do you think is the most difficult part of the workshop?

5.) Did you spend money on the whole event? Is it over your budget?

6.) Are you satisfied with the finished unit work?

7.) Do you think the final unit work can represent the street or the city?

8.) If the workshop needs to be improved, what do you think can be done?

Through the observation of the completed works of co-creation design and the interviews with the participants, the result firstly reflects that the residents are not enthusiastic enough as participants; secondly, it is difficult to collect materials, and the capital budget is the biggest problem; thirdly, the completed works are inconsistent with the expected setting, and the unit works lack elements representing the characteristics of the city. (Figure 78)

Figure 78. Participant Interview Record

In the setting of the workshop, considering the time problem of residents' participation, we arranged the design academic to coordinate and guide in the middle. In the project implementation stage, the community management personnel can be taken as the coordination and guidance to assist the residents to complete the cooperative design. However, in the process of residents' participation, there are still some problems, such as lack of time and willingness. The motivation of residents' participation is community organizations. On the one hand, the organization and propaganda are insufficient. On the other hand, the community is the core link of residents' activities, and the co-creation workshop must be designed by communities.

Furthermore, a simple production tool is provided, thus offering the plans to collect and combine waste materials. In the actual operation process of the project, waste materials cannot be obtained in a short time. The residents have little budget for the workshop, and the cooperative students buy a single variety of materials in the limited budget. The co-creation design needs a long time of organization and arrangement, which is carried out by the community budget. The production tools are purchased and stored at one time, and the waste materials are saved from the daily management of the community.

Also, from the setting of the workshop, the finished works can have city image symbols and cultural elements as texture. The result is that in the selection and composition of non-conventional materials, residents and participating students only focus on how to combine the materials according to the set arrangement. The finished unit works can meet the aesthetic needs of the public, but they do not represent the characteristics of the city and street.

Of course, there was positive feedback from the whole workshop. The residents thought the creation process was interesting and were willing to lead their children to participate. Residents are satisfied with the finished unit works. Although they think it has little to do with the city street, however, it can improve the decoration environment of the street. And residents hope to have more professional artists to join the guidance, and thus enhance their aesthetic ability.

4.4 Finding and Outcomes

Through the implementation of three workshops, the findings and results are obtained. Among them, the Bangkok Chinatown workshop found collage art as a form of expression of old buildings. Taking the San Frediano in Cestello project workshop in Florence as an example, we found the abstract method from art form to design elements. Principles and organizational methods for co-creation were found in Chongqing residents' co-creation workshop. The results of the first two workshops are cumulative sum process, and the residents' co-creation is the final outcomes and summary.

Collage art, as a common means of post-modern art expression, can integrate the relationship between new buildings and old buildings. It is a method for

residents to quickly participate in co-creation. As a kind of post-modern performance art, collage art is in line with the creator's direct expression of emotion. Through the collage and position change of concrete elements, the choice of materials is more diversified, which is in line with the immediate aesthetic characteristics of contemporary art.

Abstract expression is the changing process from concrete works of art to abstract design elements. The first abstraction from picture to sketch, the second abstraction from sketch to symbol, and the third abstraction from symbol deconstruction to a reorganization are adopted to make art more in line with the standard model of modern design. Abstract artistic symbols can represent the cultural characteristics of the city, and make the aesthetic of art more profound through abstraction. Cultural symbol design is not a simple imitation and repetition. Through deconstruction, the aesthetic level of culture can be improved.

The principle and organization of co-creation are the core of the whole workshop. Using the basic design principle and design element theory, this paper deduces the abstract model of collage art in theory, and implements it in residents' co-creation through art education:

1). Simplify the design process and provide design templates.

2). Optimize the design process and enhance the entertainment.

3). Expand the dual dimensions of co-creation in time and space.

Chapter 5 Implement in Chongqing Xiahao Street

The old district of Chongqing is selected as an object of case study and the sample created in practice is taken as a part of the new method manual. As a case study of urban development in China, the old block of Chongqing is universal. However, as the center of the city is located at the junction of mountains, rivers, and canyons, it is a typical city with mountains and rivers. It has unique characteristics in urban planning and design. Xiahao old block is located in the center of the city. Approximately 20 years ago, due to the imperfect traffic roads, many small streets were connecting to the main roads, mainly between the mountain roads and the riverside roads, and the streets gradually changed into secondary roads throughout the city. However, due to the limitation of the elevation differences, these roads along with the improvement of the road network structure, automobile traffic engineering with the gradual replacement of hiking traffic, these roads have also declined. This also occurs with similar roads structure include Chongqing's most famous Shibati, Shanchengxiang, and other developing cities road.

5.1 Project Information

Xiahao Street is located in Nanbin Road, Nan'an District, Chongqing City. Because it is an early life-building area, the location is very advantageous. The whole area is relatively narrow, and the height difference is very large. They are mainly residential buildings. Only one of them is defined as a historically protected building and the overall lack of development to others highlights. This is a very typical urban old block mode. At present, most of the residents have moved out of here, and some buildings have been in disrepair and become unsafe and dangerous buildings. (Figure 79)

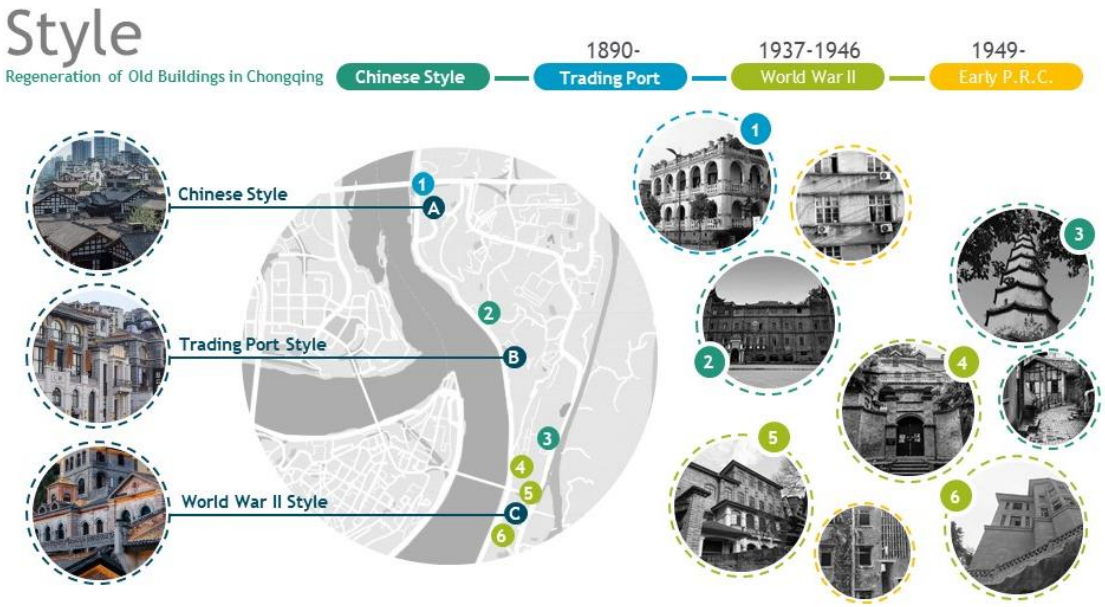

Figure 79. Architectural Style along Nanbin Road

5.1.1 Site Analysis

The street is located in the narrow zone between the Yangtze River and Nanshan mountains. The street is connected from east to west, and the area is relatively narrow. The building height is 4m to 8m, and the street width is 6.5m to 9m. The maximum D / H is 1.6 and the minimum D / H is 0.9. The height difference of the street is generally gentle, with local steps. The height difference of steps is 3.2m. The buildings in the street are mainly residential, but on the first floor of buildings, they are generally transformed into merchants, which is a very typical urban old block mode. Some of the buildings are in disrepair for a long time and become unsafe and dangerous houses, which are uninhabited. (Figure 80)

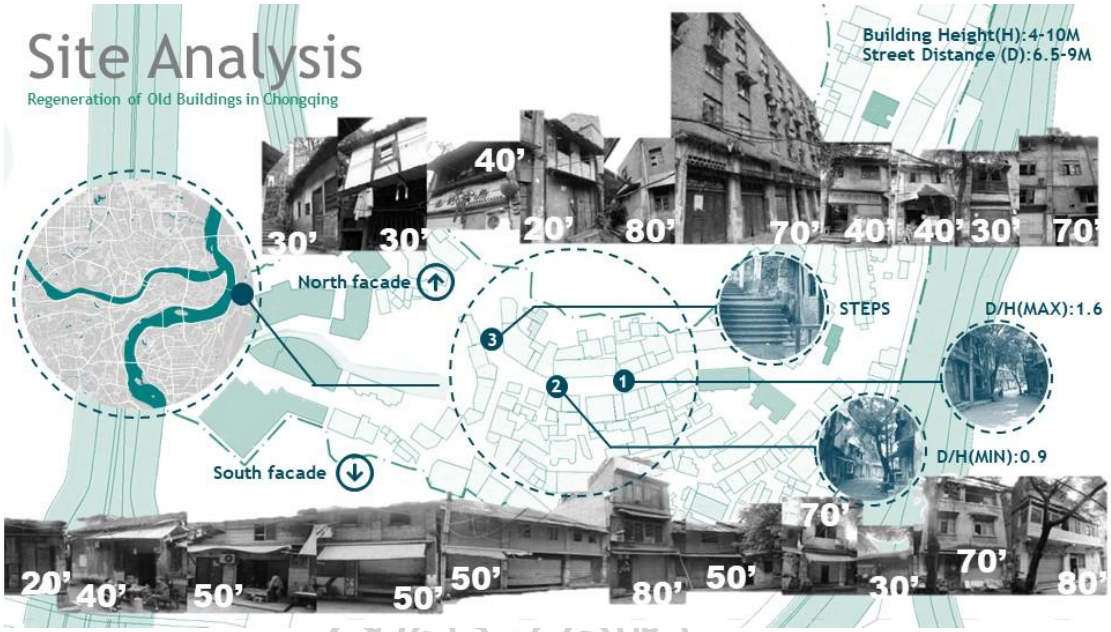

Figure 80. Site Analysis: Old Buildings in Xiahao Street

5.1.2 Stakeholders Analysis

According to the data survey of stakeholders, due to the complex composition of the site residents, there is no property management in the old community, so the financial expenditure of the community neighborhood committee is taken as the community maintenance cost. There are three types of stakeholders: community managers, bottom merchants, and ordinary residents. According to the four aspects of project funds, function improvement, environmental beautification, and later maintenance, questionnaire survey, and data analysis are carried out on three kinds of stakeholders, and the results are obtained: (Figure 81)

1). Community managers are the main source of project funds, and ordinary residents are more resistant to the problem of funding;

2). Function improvement is the main demand of residents, which is mainly sunshade function;

3). Merchants have larger requirements for environmental beautification, including building renovation and public facilities setting; and

4). Later maintenance is relatively average, and all have the desire to maintain.

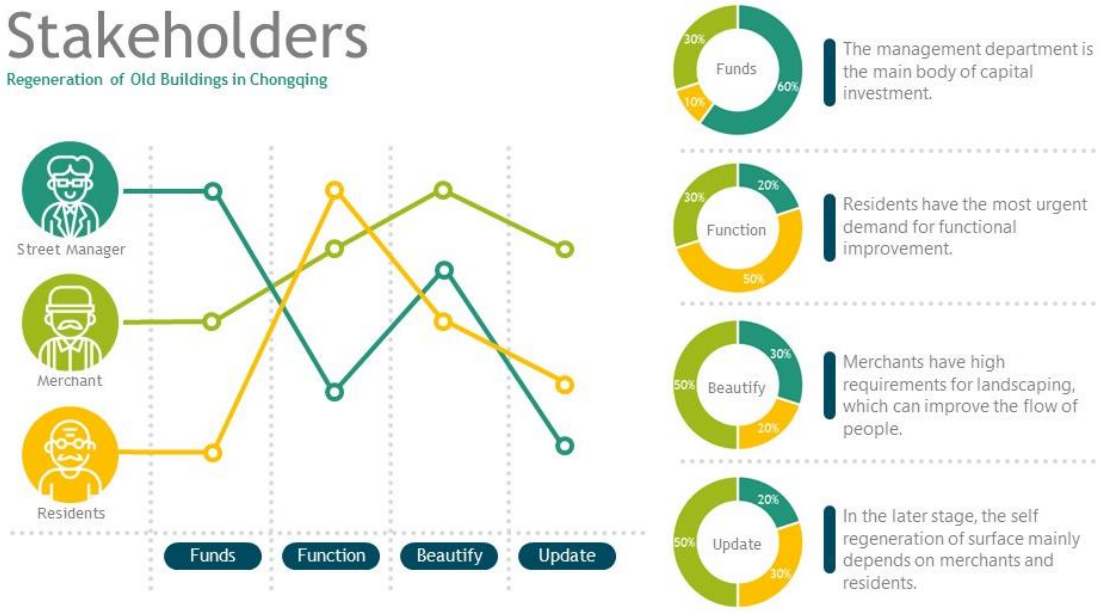

Figure 81. Stakeholders Analysis

5.1.3 Building Category

There are 26 buildings on the site, including 6 modern style buildings and 17 traditional-style buildings. Among these 17 buildings, there are 7 brick concrete structure buildings and 10 wood structure buildings. Among the 10 wooden component buildings, 7 buildings are intact, and 3 buildings are completely damaged and became dangerous buildings. (Figure 82)

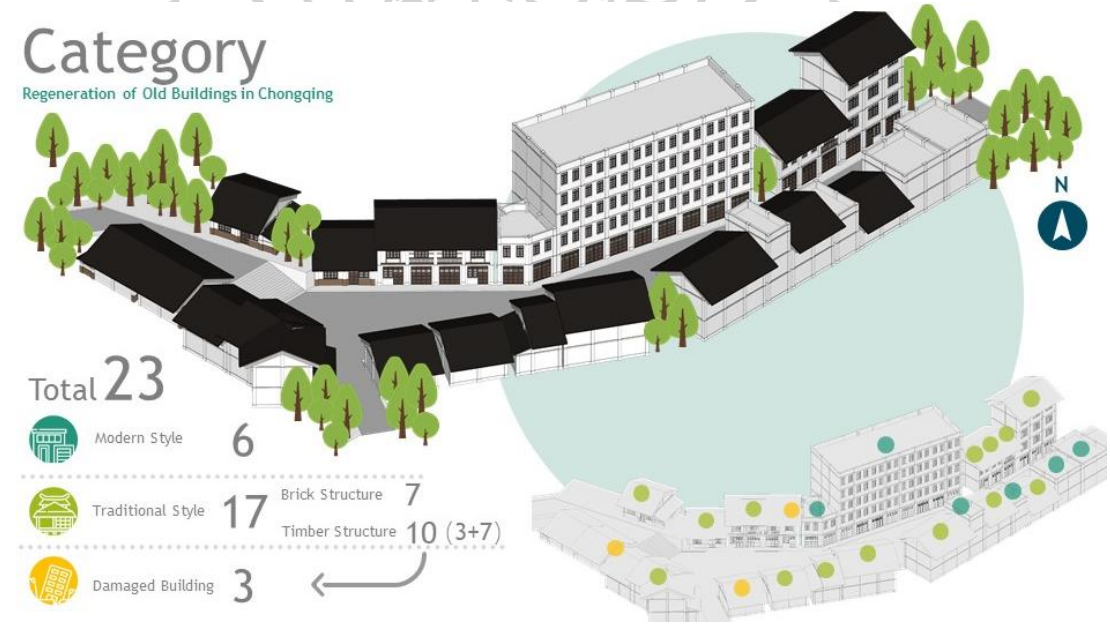

Figure 82. Building Category and Locations

5.2 Building Surface Framework Design

The foundation of building surface is decoration. In the same way, the primary goal of reconstruction of the old building surface is to achieve the beautification of the building facade through new decoration. Through the preliminary research on the residents, it is found that the lack of demand for residents is the main problem in the transformation of old buildings. Some residents are not willing to transform. The primary purpose of building facade reconstruction is to improve the function, and the residents have no voice in the transformation effect. The size of the modular frame system is a user unit as the basic size, and the size between two columns and two floors is a standard unit modular. The size of the standard modular is 3000mm × 3000mm, and the size of the modular unit is 750mm × 1500 mm, to realize the flexible combination of modular units. With this basic size setting, the modular system is classified according to the different emphasis on decoration and function.

5.2.1 Modular Framework Design

The modular system takes the function as the core. According to the survey results of residents, the main requirement of the residents for the building facade reconstruction is shading. Due to the change of seasons, the demand for sunshades in different seasons is also varied throughout the year. On the one hand, the requirement for sunshade is the strongest in summer, especially for houses with windows facing the West; on the other hand, in the cold and humid winter, the residents' requirements for the lighting of houses make them particularly reject the building surface shading treatment. Adjustable is the building surface, and the modular is the core of the design. The modular system refers to the functional form of the building facade window system, and can realize the opening modes of "Hung" "Pivot" "Sliding" "Folding and Roller". Through the analysis of these four ways, two forms of "Pivot" and "Sliding" are obtained. By combining and changing the direction, they can change the form similar to the window opening. It should be noted that the modular system designed here is not a window system, and it does not need perfect window functions but adopts the opening form of a window system for classification. (Figure 83)

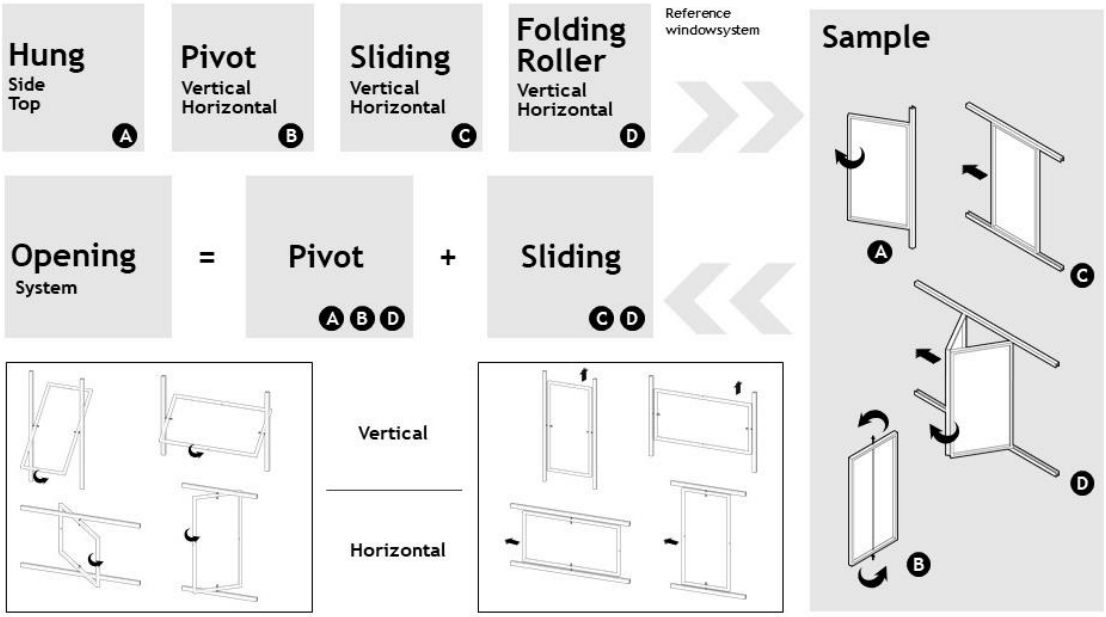

Figure 83. Window System to Opening System

Size. If the opening mode of the modular framework is determined, the size can be determined. Like the fixed system, it is divided into a standard modular and a minimum modular. Since the rotation of the modular unit will occupy space inward, the modular is only 750mm + 150mm and 1500mm + 150mm from the wall. As shown in the figure, because the modular unit needs to rotate and slide the track, it can be divided into two types: A and B, corresponding to 8 forms of the minimum modular and standard modular. The whole modular can be rotated 90 degrees to achieve horizontal and vertical changes. In particular, according to the typology related principles and architectural aesthetic principles, the same building facade to design a sense of sequence, generally do not use a variety of different opening and closing methods, so it is not necessary to consider the horizontal direction change and vertical direction change at the same time. (Figure 84)

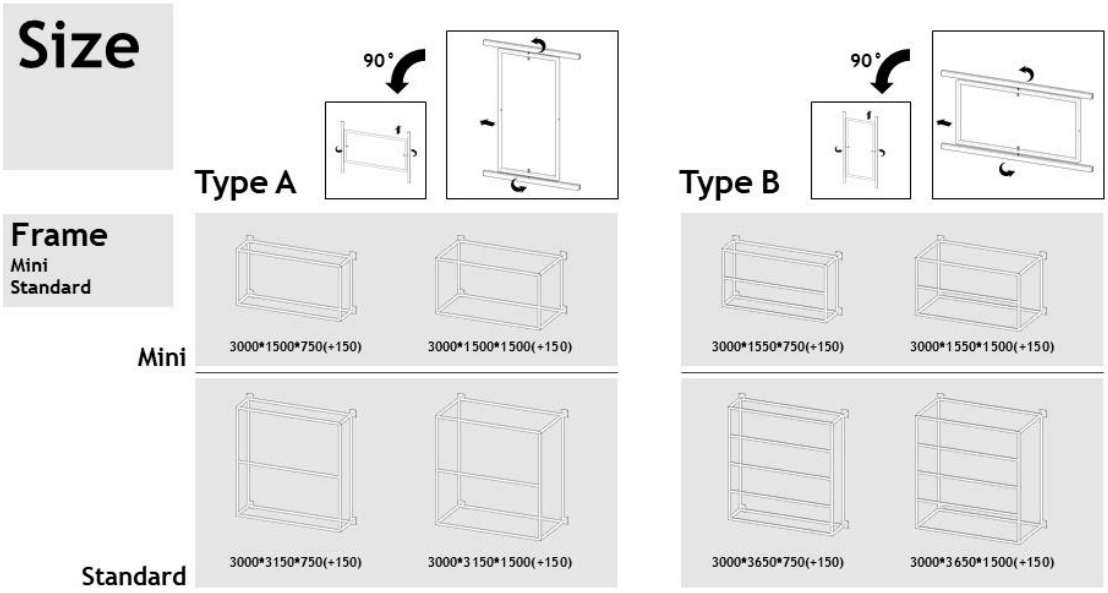

Figure 84. Size of Frame

Component. The opening system adopts the track as the way of rotation and sliding. There are three forms in the prefabricated components. The first one is the unilateral slotted galvanized steel pipe, which is the main prefabricated component of the opening system. It is set around the modular frame and has five dimensions, namely 3100 mm, 3150 mm, 3250 mm, 1600 mm, 1650 mm, Generally, 45-degree oblique cutting is done and field welding installation is conducted on site; the second type is bilateral slotted galvanized steel pipe, which is set in the middle of the modular frame, and the minimum modular is not required, only one size of 3000mm; the third is the conventional square galvanized steel pipe, which is used to adjust the modular and wall size, with two sizes of 750mm and 1500mm. Besides, there is one kind of wall fixed prefabricated parts, and the floor fixed roof is not designed. Considering safety and functionality, the adjustable system is not recommended to be used at the bottom of the building. The slotting design is the core link of prefabricated parts. The connector can be inserted into the groove to play an adjustable sliding and fixing role.

Joint. The connection form of the opening system is simplified to one, which can realize “Pivot” and “Sliding” functions at the same time. The connecting pieces are made of nuts with a metal gasket inside the groove, rubber gasket,

wooden modular unit, and screw outside the groove. They are fastened by nuts, and the tightness is adjusted by screws to achieve the fixed function. (Figure 85, 86)

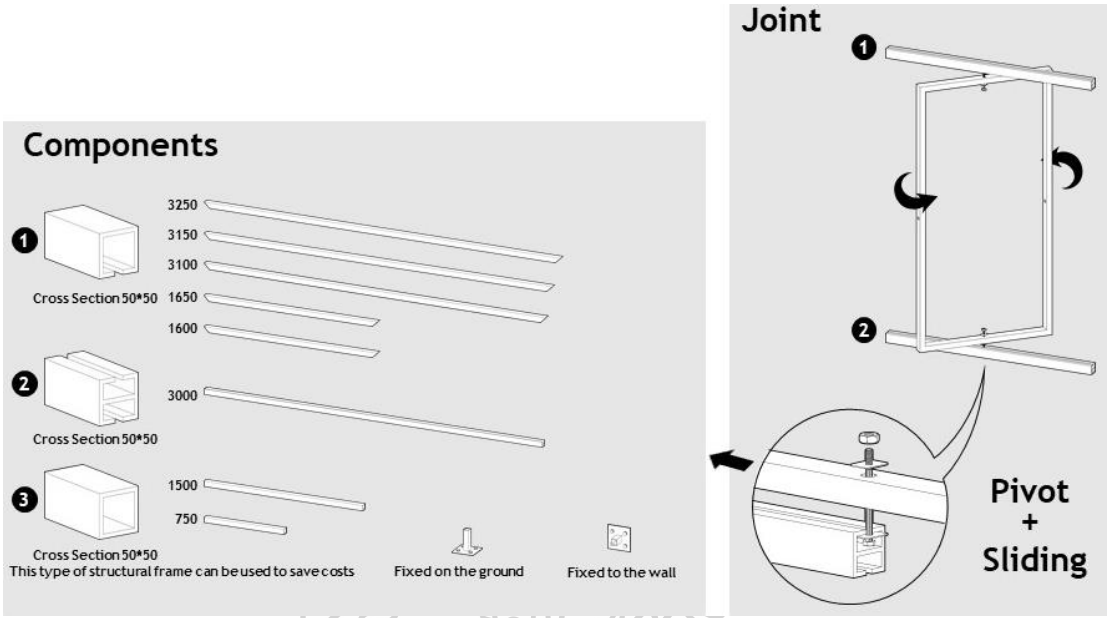

Figure 85. Components and Joint

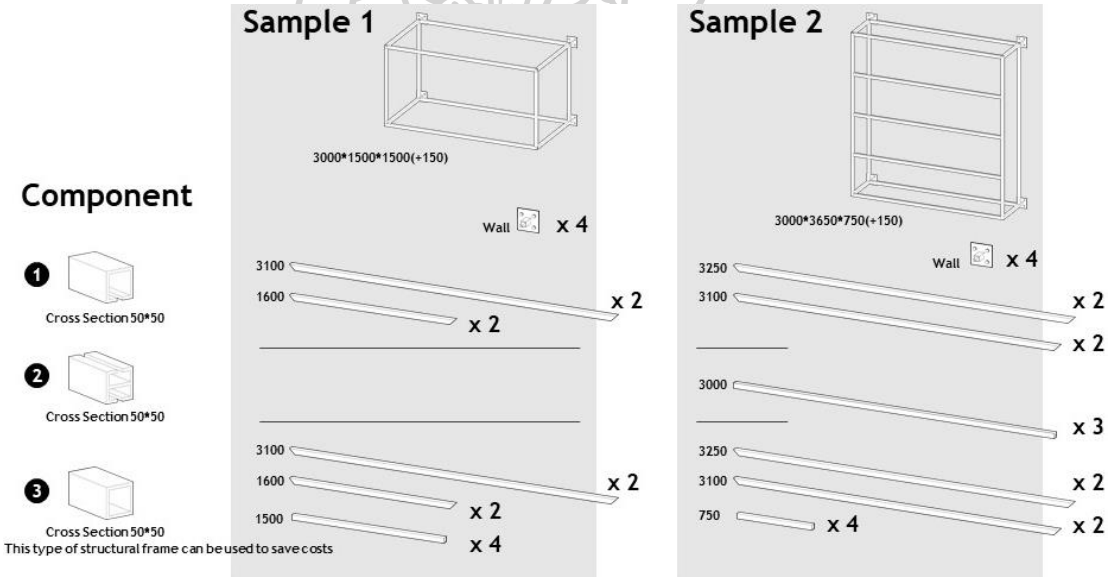

Figure 86. Sample of Modular Frame

Shading Area. In the open system, the direction of the whole modular is consistent with the opening and closing type design, and there is no need for a simple model. Architects participate in the design process and the adjustment and change process, and the residents' cooperation is feedback cooperation. In the analysis of shading and blocking indoor lighting, when the inner area of the modular

unit is reduced from 100% to 60%, the shielding solar radiation coefficient is reduced by one level, while the natural lighting is increased by three levels; when the inner area of the modular unit is reduced from 100% to 40%, the shielding solar radiation coefficient is reduced by two levels, and the natural lighting is increased by four levels. The conclusion is that it is recommended that the coverage area of the material should be 40% to 60% of the total area of the modular element (wood frame) in the modular elements that completely block the windows of the building. According to types A and B, the opening mode and shielding area of the open modular system are recommended as shown in the figure. (Figure 87, 88, 89, 90, 91)

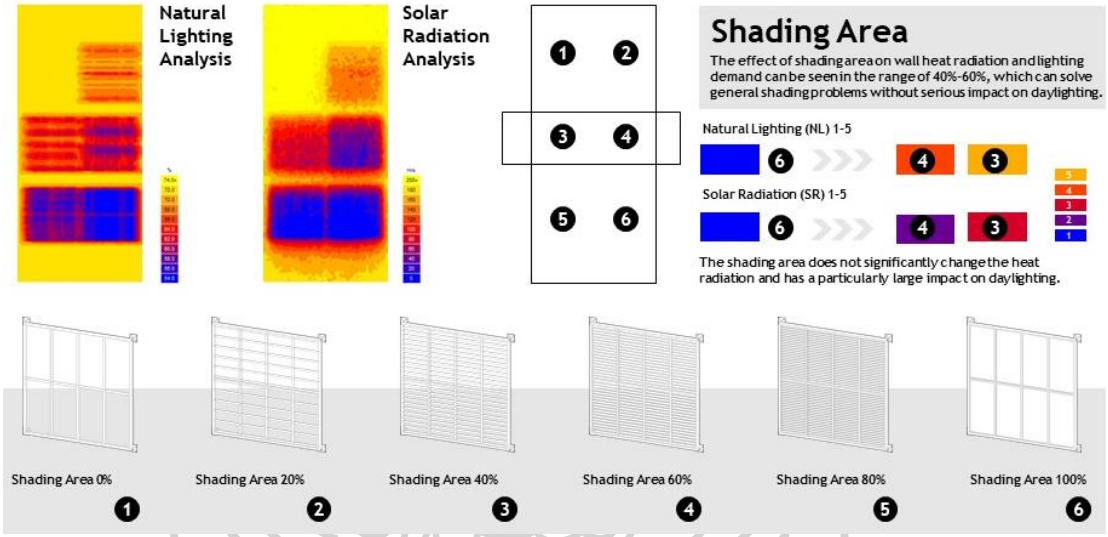

Figure 87. Analysis of Shading Area

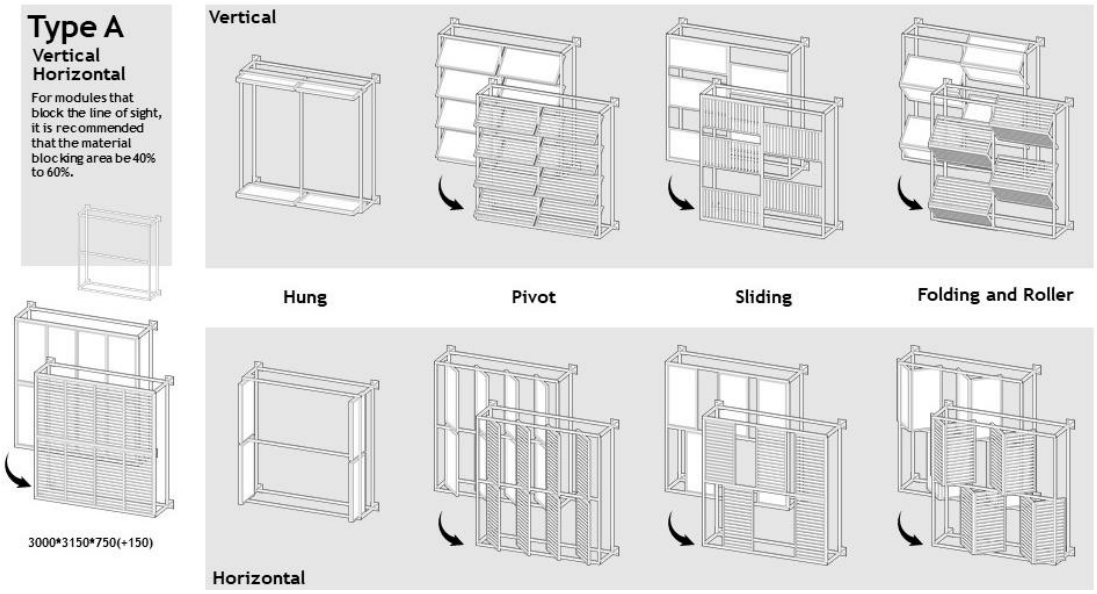

Figure 88. Type A of Frame

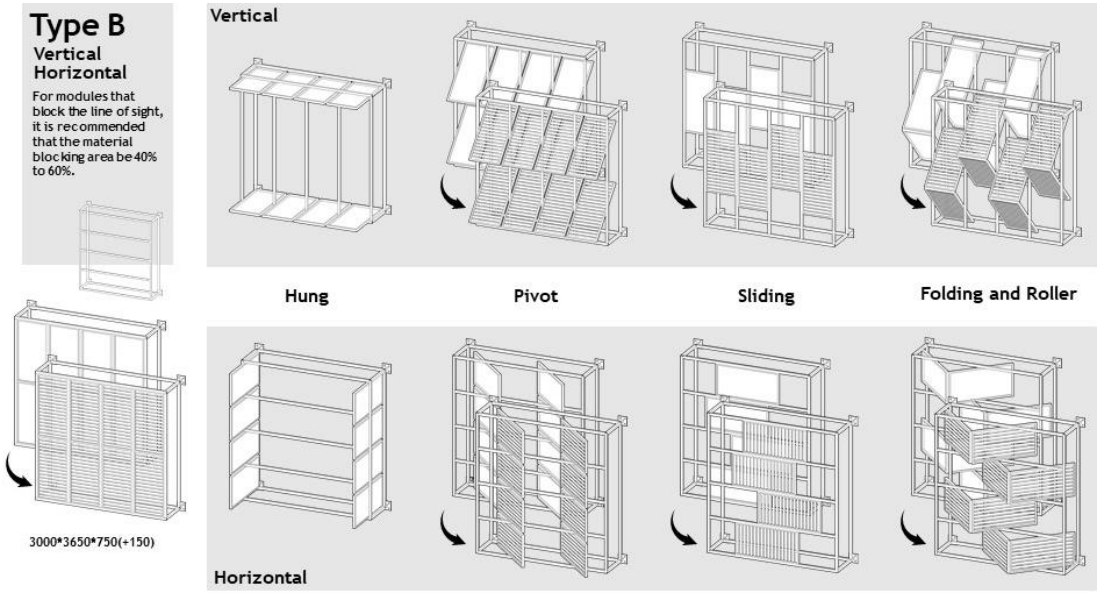

Figure 89. Type B of Frame

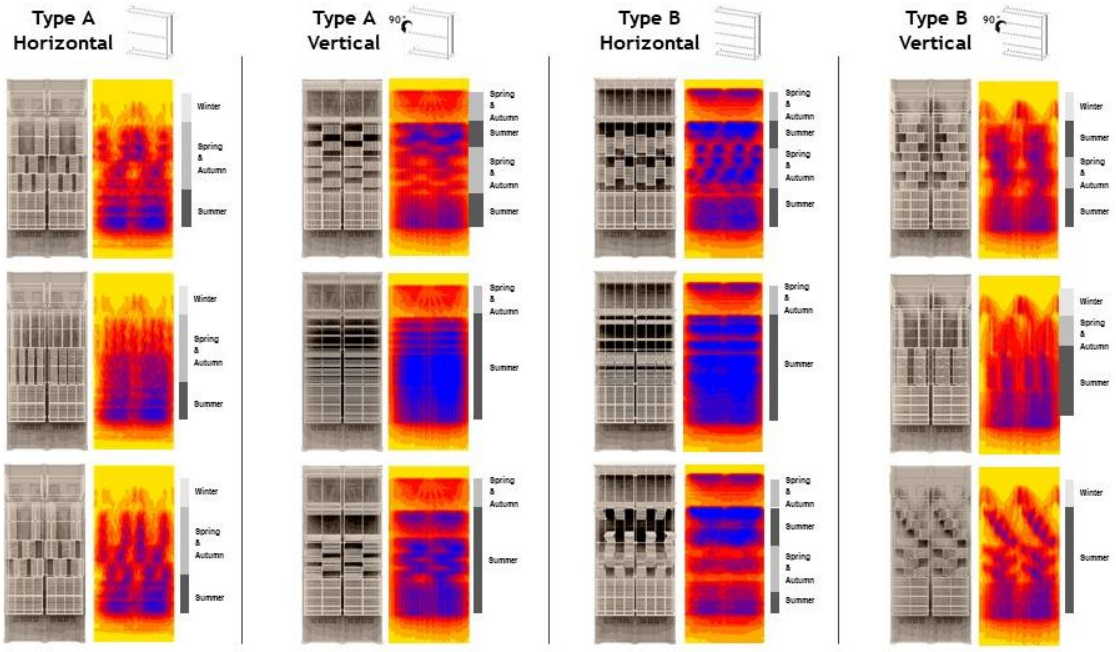

Figure 90. Solar Analysis for Different Season

Figure 91. Framework Sample

5.2.2 Building Surface Design

According to the existing site, combined with the wishes of residents' investigation, the existing 26 houses will be selectively transformed. Among them, there are 5 modern style buildings, 3 brick concrete structure buildings, 2 wood structure buildings, and 3 completely damaged buildings in traditional architectural style. The final statistics show that 10 buildings have been updated and 3 buildings have been rebuilt. Meanwhile, the road repair and overall repair works have been carried out on the street. (Figure 92, 93, 94, 95)

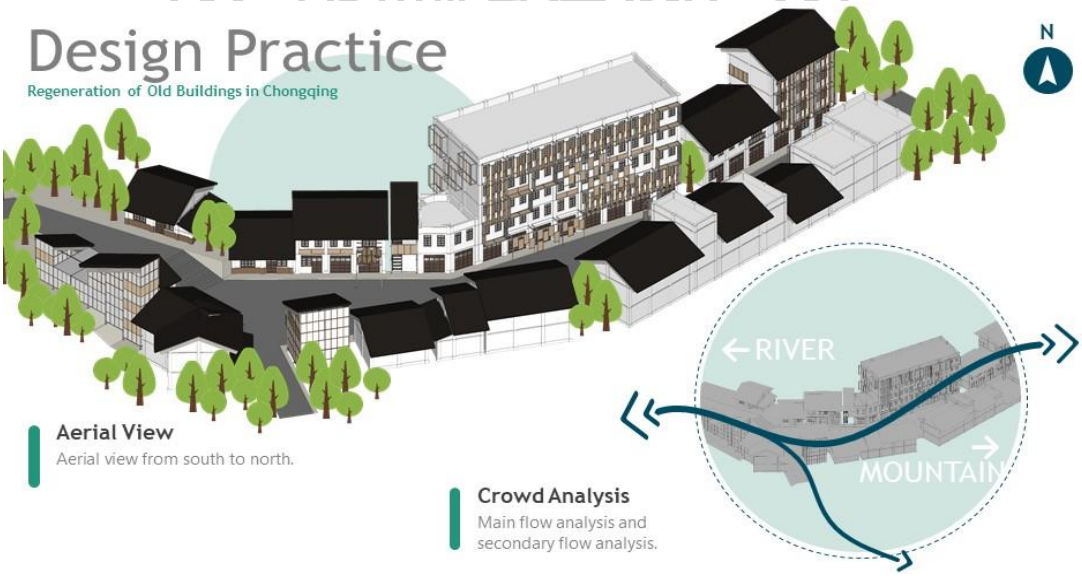

Figure 92. Aerial View and Crowd Analysis

Figure 93. Aerial View and Buildings' Elevation

Figure 94. Aerial View and Building Category Regeneration

Figure 95. 3D Rendering of Reconstructed Building Categories

The modular design of modern style buildings is relatively simple, and the buildings follow the size rules of building modular. Among the 5 buildings, 4 are single buildings, and the modular design is made according to the needs of individual residents. One building is a collective residence, seeking the wishes of each household. The window facade of residents who are willing to improve is designed, and the residents who are not willing to transform are not adjusted. In the facade design, combined with the changeable attributes of the opening modular, the design scheme is optimized by using the basic principles of architectural facade aesthetics and typology. (Figure 96, 97)

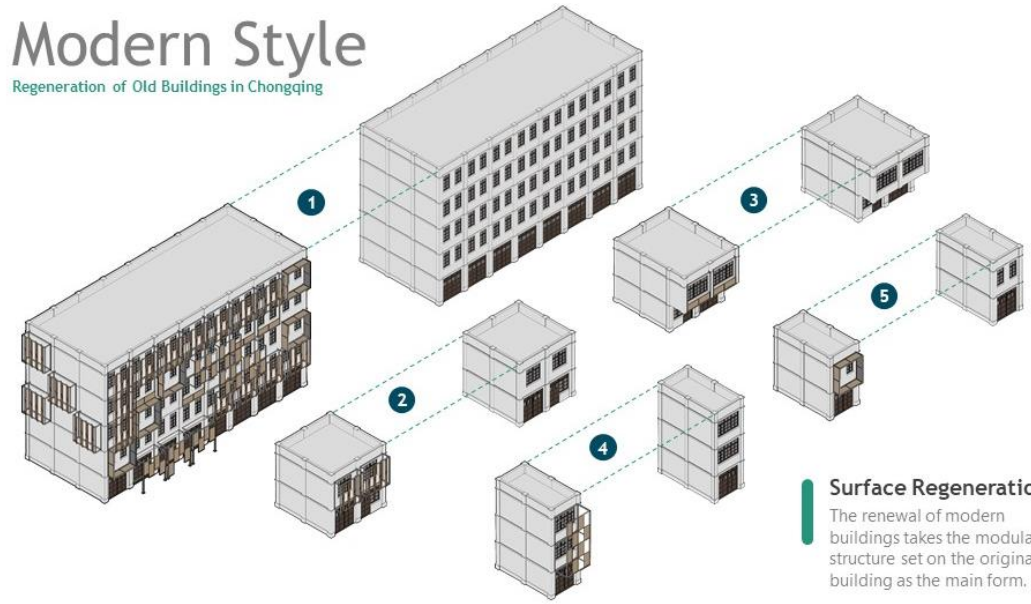

Figure 96. Surface Regeneration of 5 Modern Style

Figure 97. Modular System of Modern Style as Analysis Facade

In the traditional architectural style, the structure of brick and concrete building is a modern architectural structure form, which can be designed according to the mode of modern style architecture. The wood structure of the building support cannot fix the welding of steel bars, using the bottom support mode, fixed modular. (Figure 98, 99)

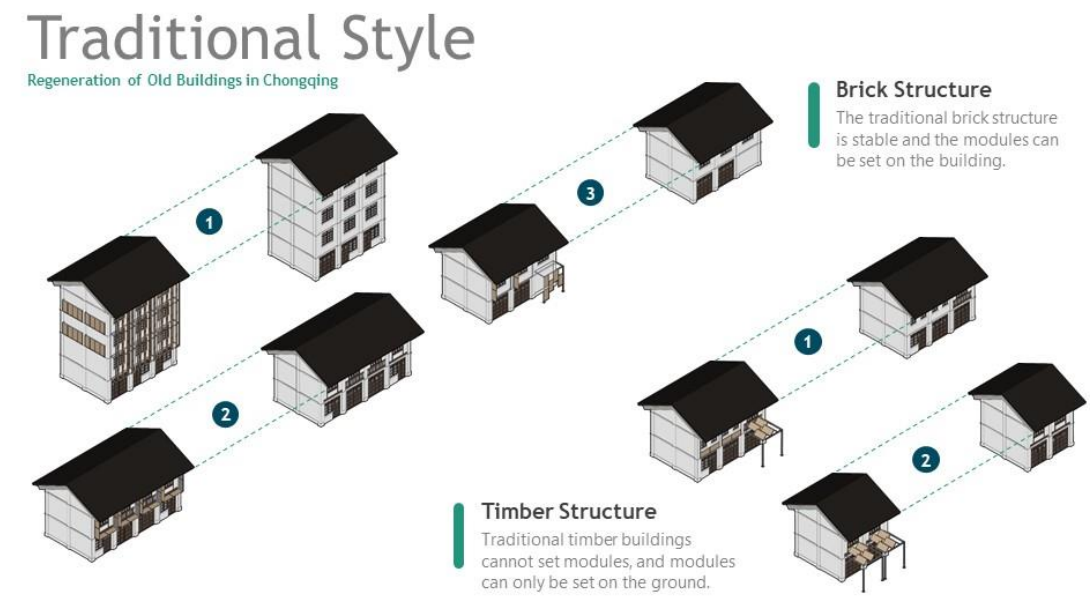

Figure 98. Surface Regeneration of Traditional Style

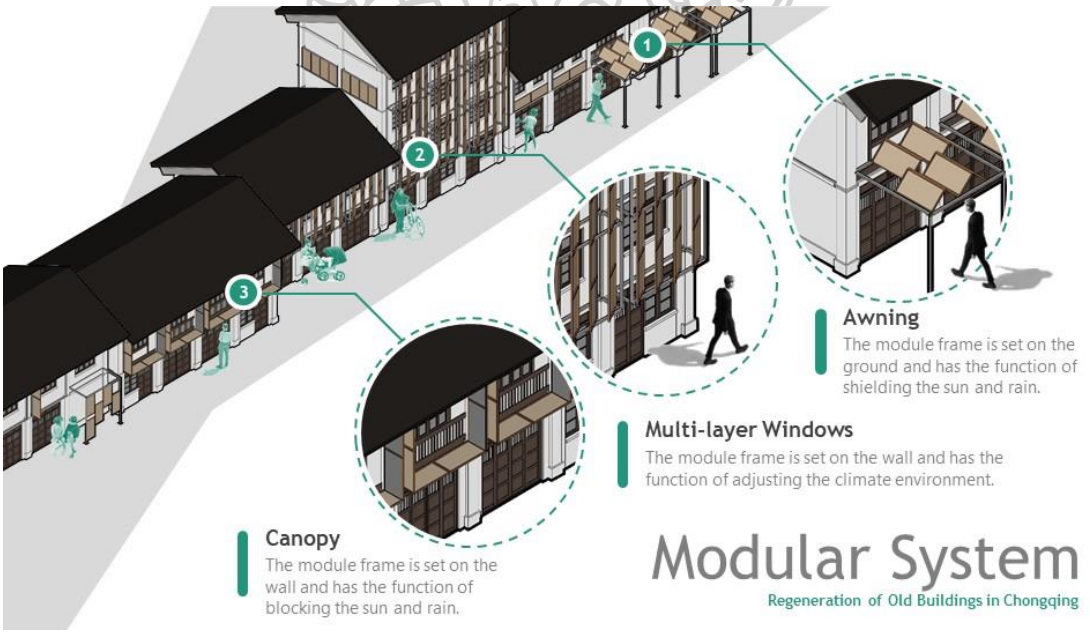

Figure 99. Modular System of Traditional Style

According to the needs of the existing streets, three types of buildings are designed. First, in the area with a large elevation difference, and design the relatively large shared space. Combined with the problem that there are no public buildings such as reading and children's playing in the old streets, a changeable shared space environment is designed. The height difference is used to design the reading activity area and lecture hall, and outdoor plants are introduced into the space to increase the green volume vitality of the community. (Figure 100, 101, 102, 103)

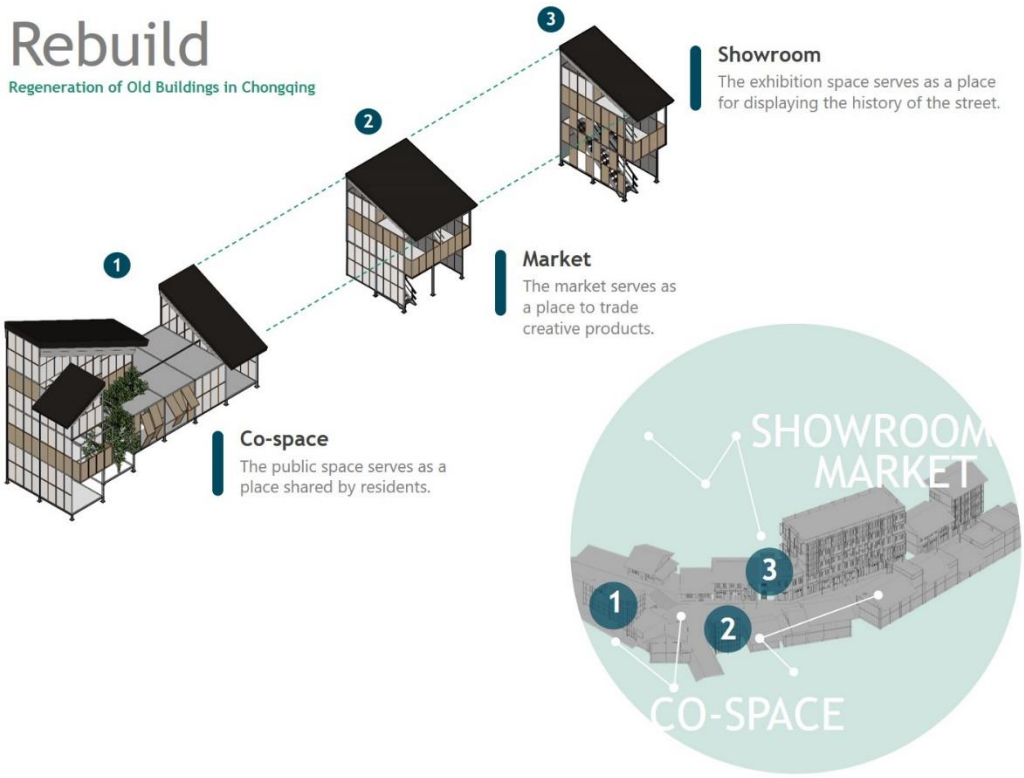

Figure 100. Concept of 3 Buildings Rebuild

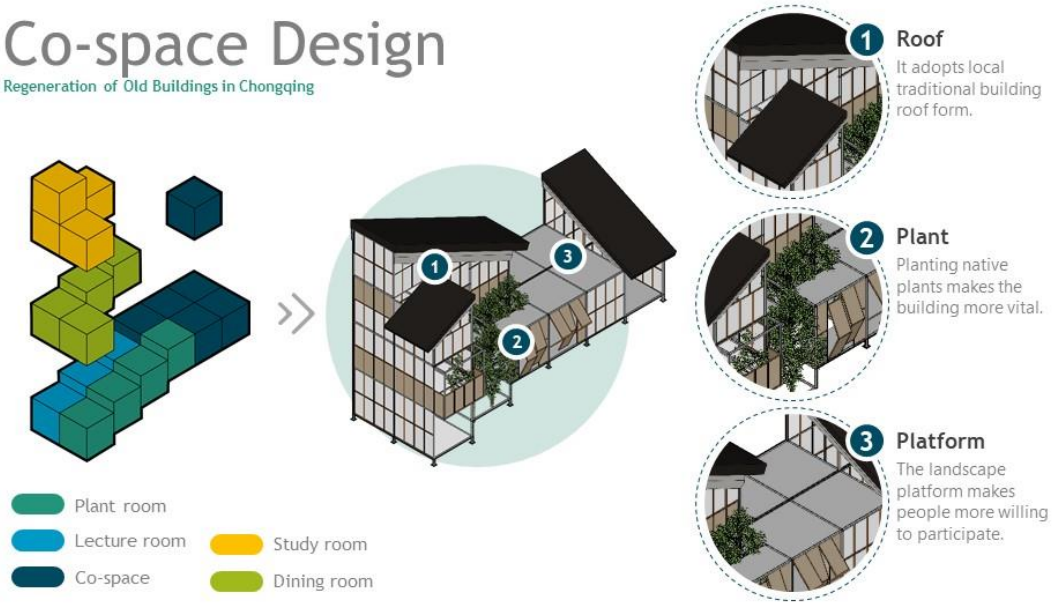

Figure 101. Co-space Design

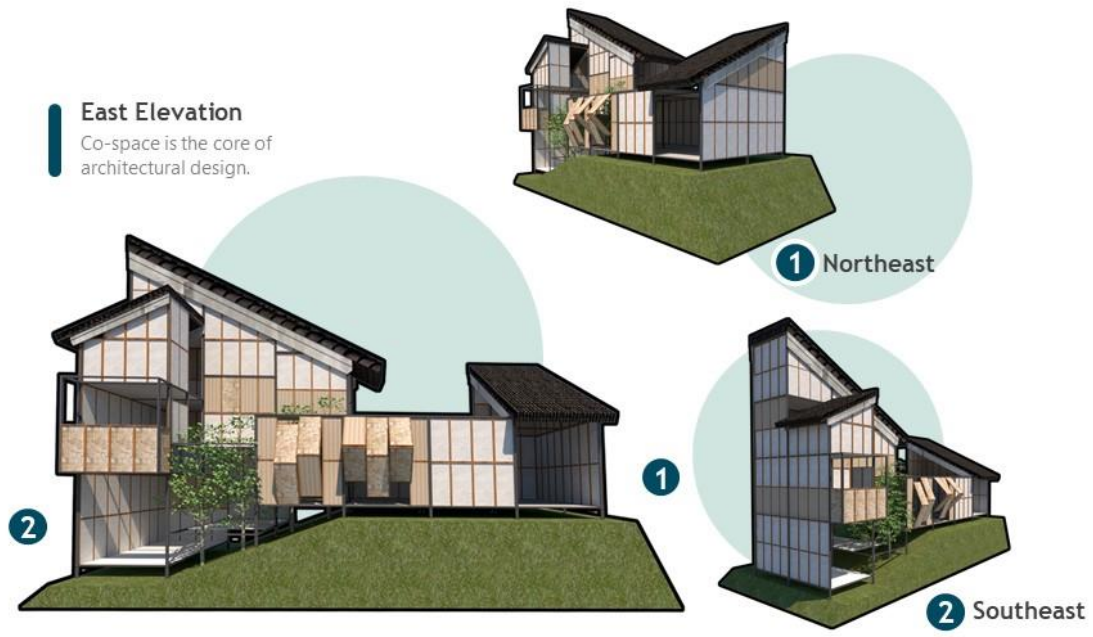

Figure 102. Co-space Elevation

Figure 103. Co-space 3D Rendering

Secondly, the commercial area is designed in the middle of the street, and the modular commercial single building is designed in the form of a modular facade. The single building can be repeatedly changed into a composite building. Here, it is designed as a centralized community business and can carry out activities such as creative markets on weekends. (Figure 104, 105)

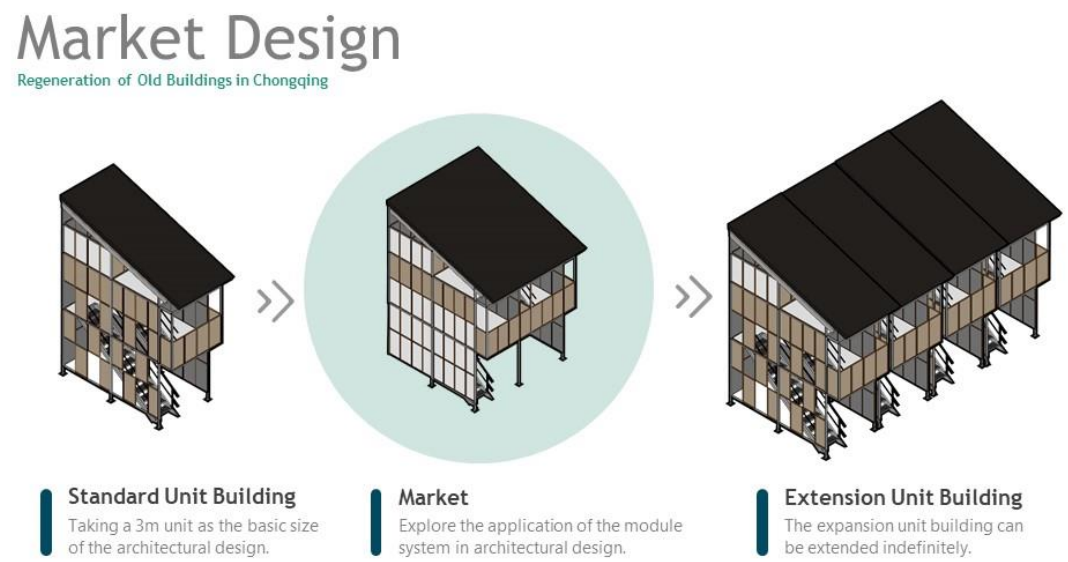

Figure 104. Market Design Comprised with Standard and Extension Units

Figure 105. Market 3D Rendering

Third, the long and narrow blank area is designed with surrounding buildings to form an interesting exhibition space. The display is not only the display of pictures but also the manifestation of architectural form and living environment. Spiral traffic is used to integrate new buildings and old buildings, reflecting the harmonious coexistence of new and old buildings. (Figure 106, 107)

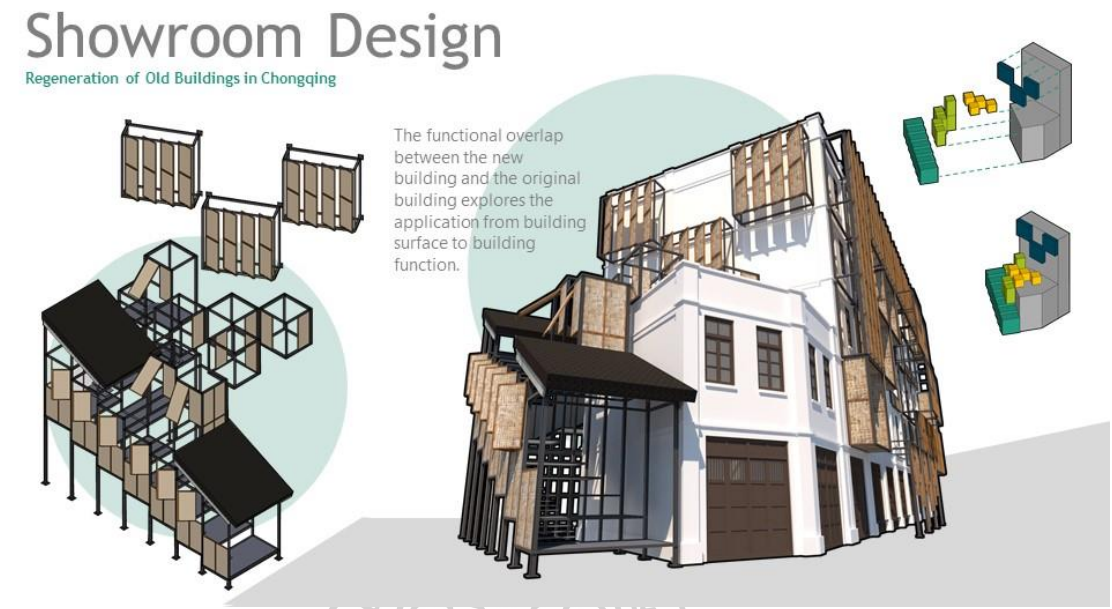

Figure 106. Showroom Design: Overlapping of the Original and New

Figure 107. Showroom 3D Rendering

5.3 Co-creation for Building Surface

5.3.1 Design to Residents' Co-creation

The project is located in the core area of Chongqing. The urban architectural style includes the traditional architectural style (Diaojiao Building) with the characteristics of Chongqing, the early Western masonry architectural style in the

port opening culture, and the Chinese and Western architectural style in the period of the Republic of China.

In the part of cultural elements, the most representative folk culture in Chongqing is selected. In the intangible cultural heritage list of Chongqing, there are bamboo weaving, New Year pictures, summer cloth, coarse pottery, and other traditional craft products. (Figure 108)

Figure 108. Cultural Symbol of Chongqing

The image of the city takes Chongqing as the hot search keywords of the Internet top-rated to search for images, such as punk-cyber, hotpot, mountain city, bridge city, and 8D magic city. (Figure 109)

Figure 109. City Image of Chongqing

In the design of modular elements, the classification of materials is the basis. The first step of material selection is to give priority to designers and make a conventional selection of materials according to the culture and architectural form of the city. The part of residents' cooperation is the core link of material selection and combination, which mainly includes three parts: the first is the style and form of urban architecture itself; the second is the cultural symbol of the city; the third is the transformation from urban image to symbol combination. The first two are direct

utilization mode, and the last one is through transformation and reuse mode. (Figure 110, 111)

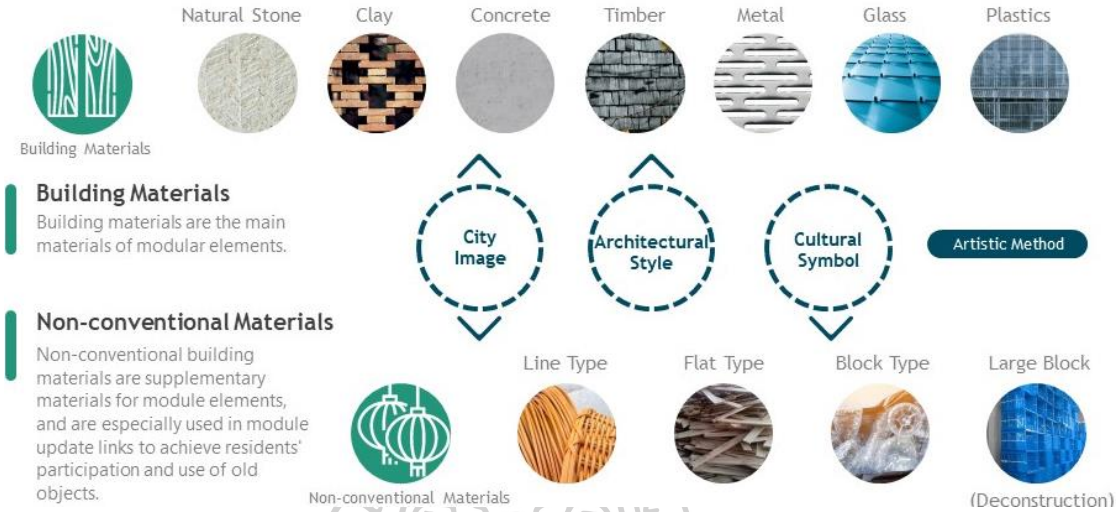

Figure 110. Method of Modular Elements

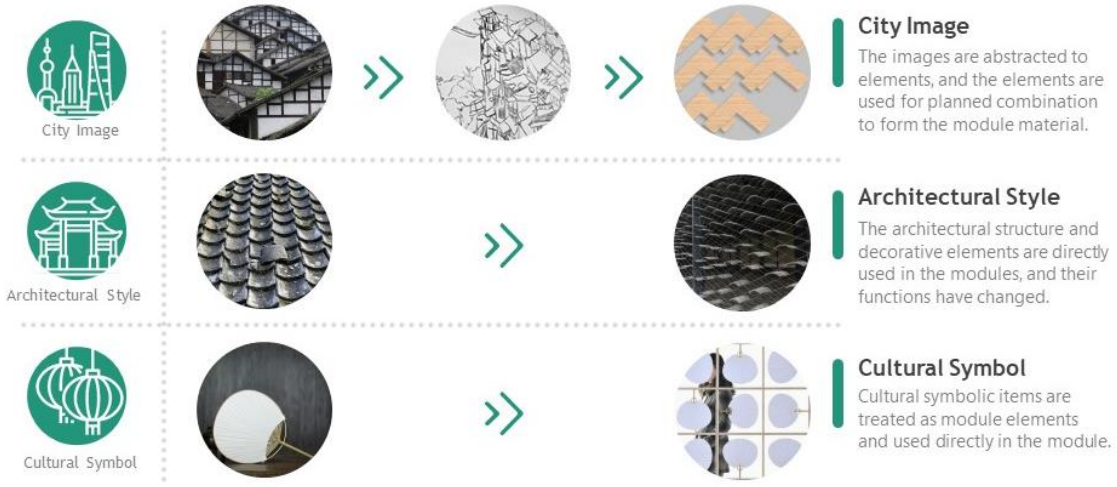

Figure 111. Material Selection and Combination

Finally, some column elements are obtained as the material of modular unit element creation. Then according to the proportion of building materials and non-conventional materials, the modular unit combination design is executed. In the part of the blank, combined with the existing design and contemporary art creation, complete the final modular element design scheme. (Figure 112, 113)

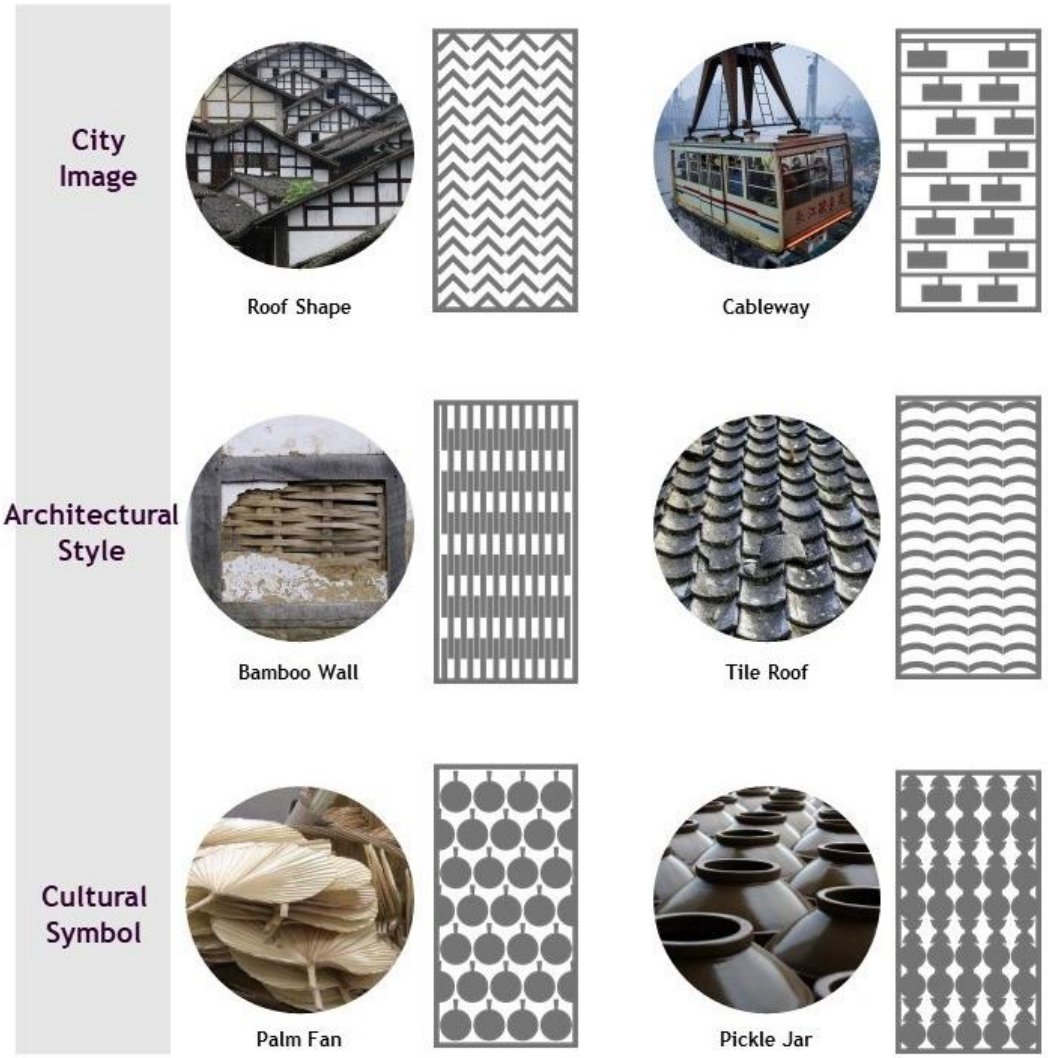

Figure 112. Basic Pattern Modular Elements

Figure 113. Comprehensive Composition of Non-conventional Materials

5.3.2 Design from Residents' Co-creation

To find the characteristics of the city, and combined with the design creation, the pattern, color and texture of the city are applied in the modular elements. Taking Chongqing as an example, by extracting three keywords that are most difficult to represent Chongqing: architecture, transportation, and life. At the same time, these keywords are also universal, which can be used for reference in other design practices.

Six representative figures were selected for sample collection, including 2 architects, 2 photographers, and 2 internet influencers. Architects can pay attention to and record the style changes of urban architecture, photographers can capture the most expressive local and instantaneous images of the city, and internet influencers are good at recording urban life's content continuously. A total of 2449 image samples were collected from six representative figures. The image samples were classified according to urban elements: architecture, transportation and life. Each category initially selects 50 photos, and then selects 20 photos from the 50 photos that best represent the characteristics of this category. (Figure 114)

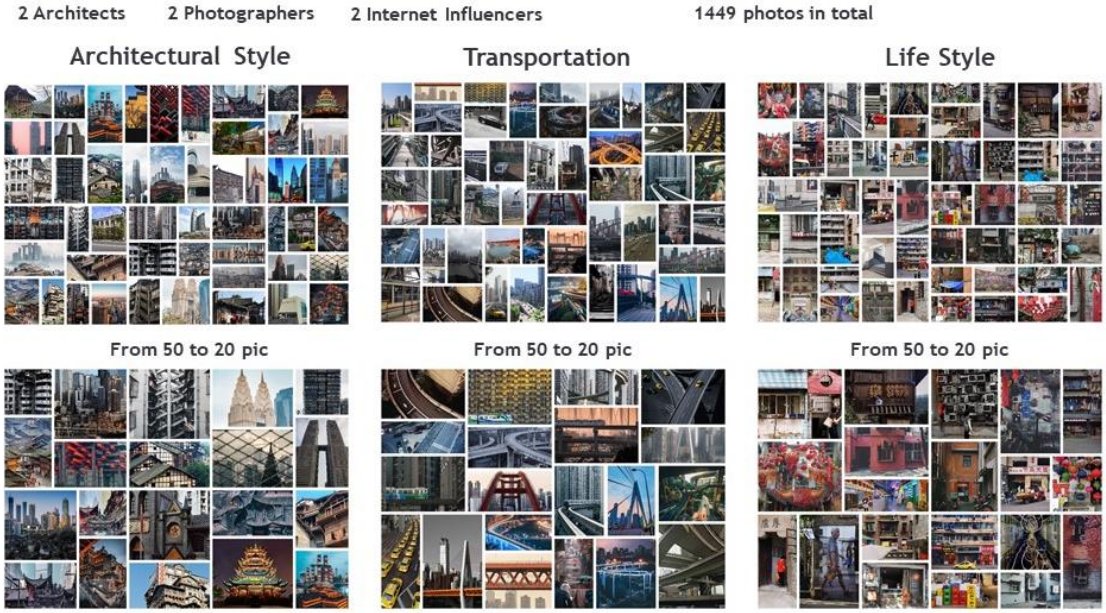

Figure 114. City Characteristics Data Collection

Taking 20 photos as creative materials, the frame style photos, detail style photos and image color are extracted. The framed photo is decolored and made into a black-and-white silhouette of the city, which can extract most city'

characteristics of the image symbol. Using the extracted urban color, and the principle that the main color constitutes a large area, and the secondary color as the auxiliary, make excellent color map, and color the city pattern. Finally, select the details of the city, and use real materials to complete the creation of urban texture. (Figure 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130)

Figure 115. Architectural Style

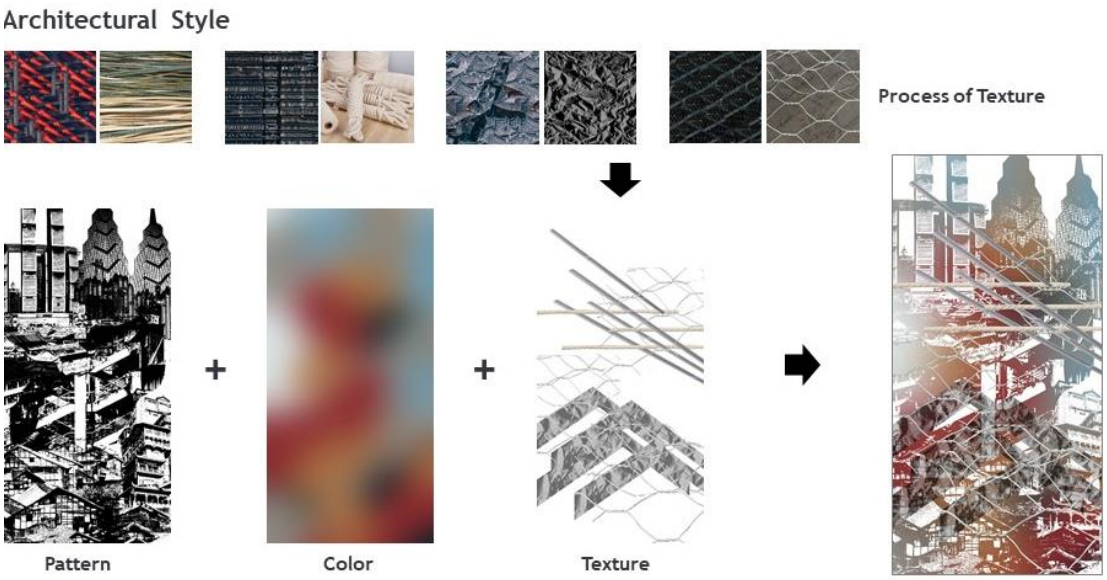

Figure 116. Element (Architectural Style) Creation Process

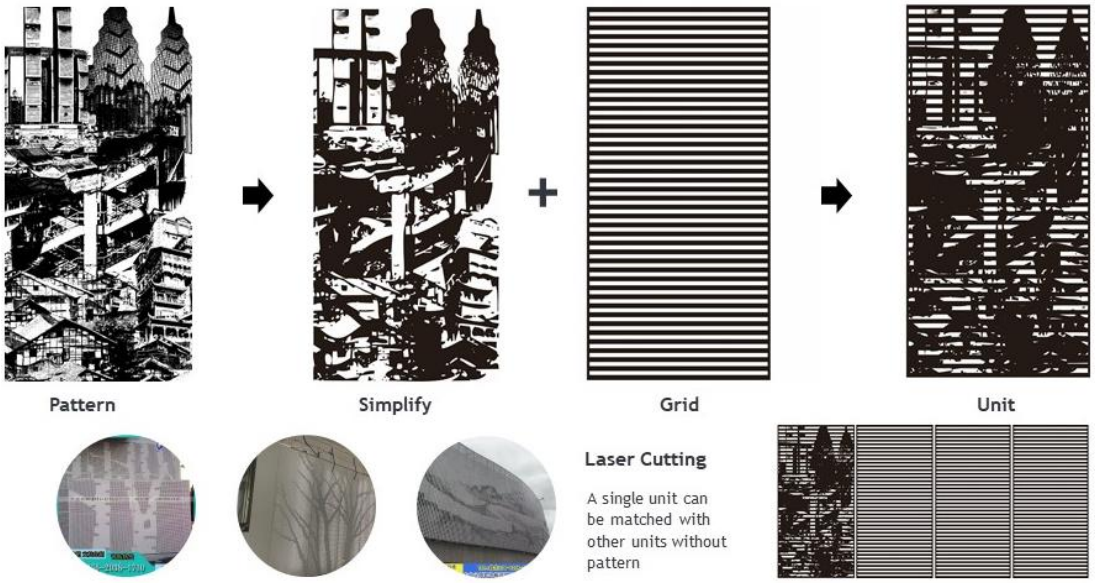

Figure 117. Pattern (Architectural Style) Abstraction Process

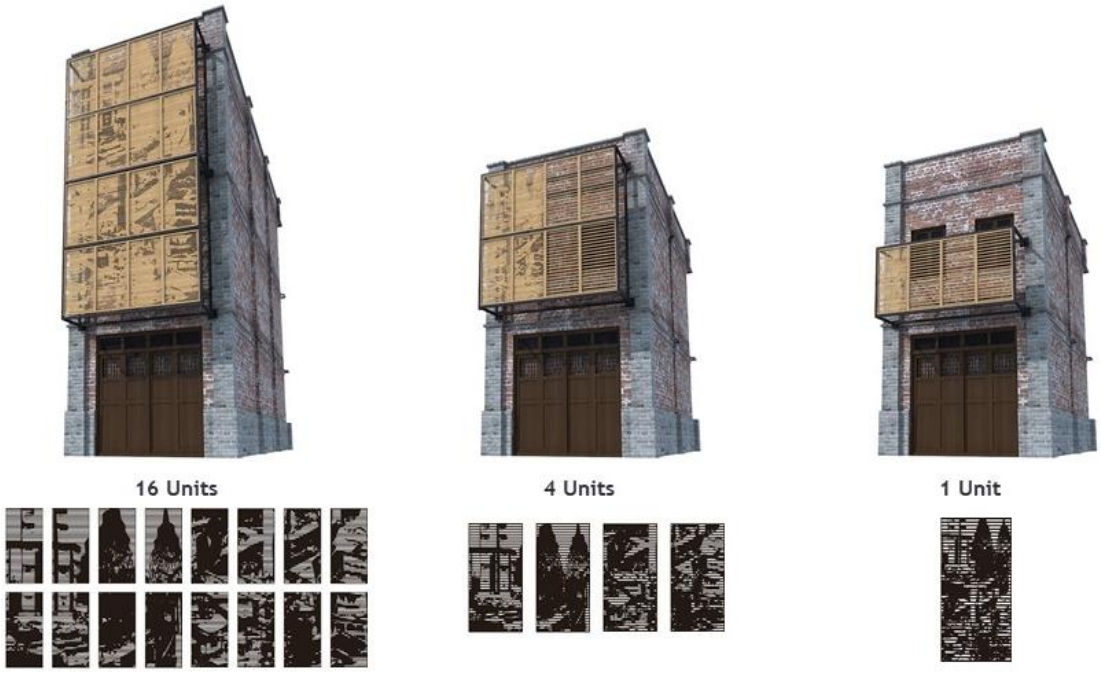

Figure 118. Application (Architectural Style) of Different Size

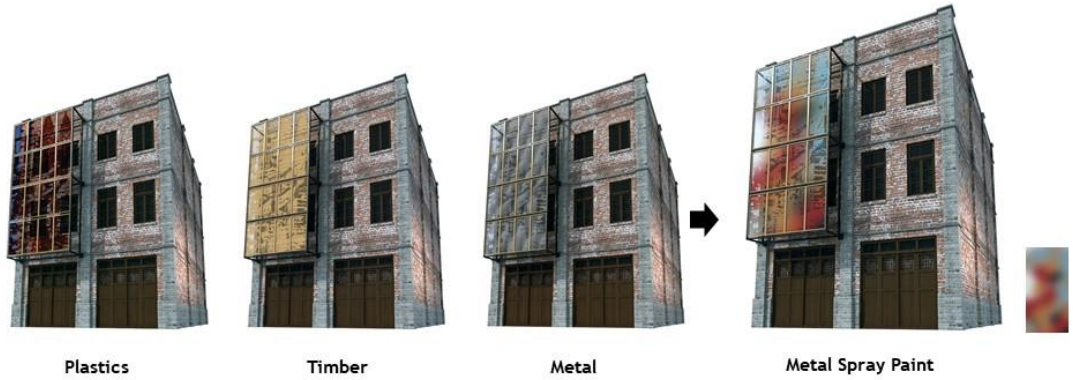

Figure 119. Application (Architectural Style) of Different Material

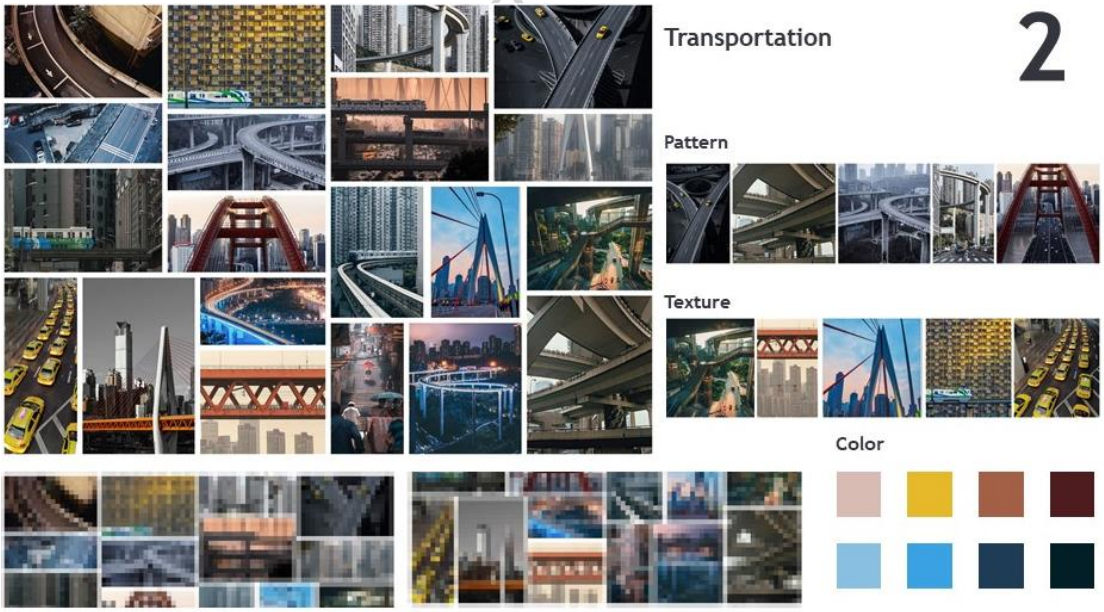

Figure 120. Transportation

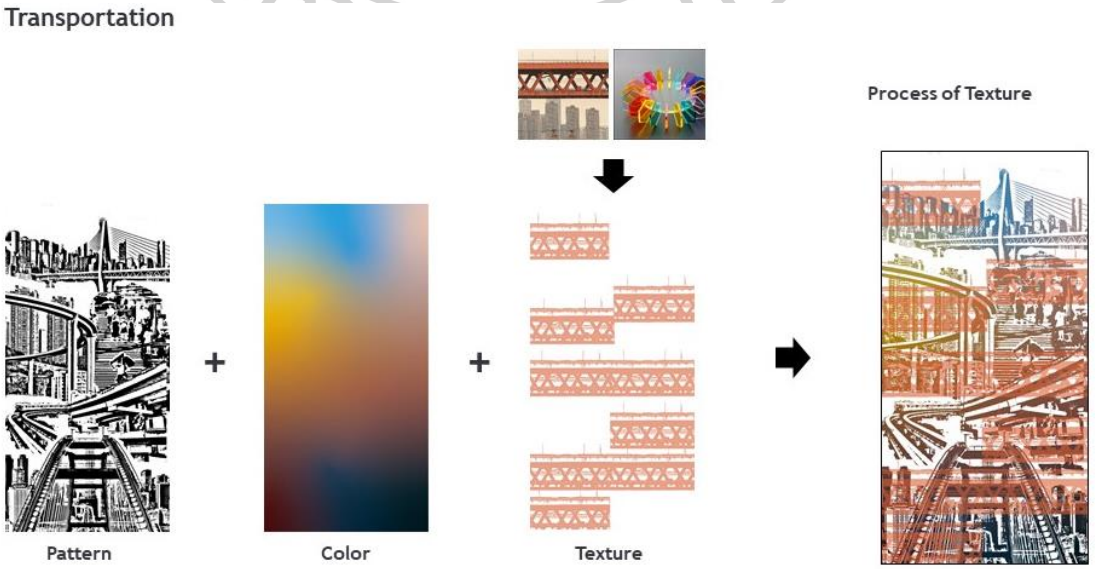

Figure 121. Element (Transportation) Creation Process

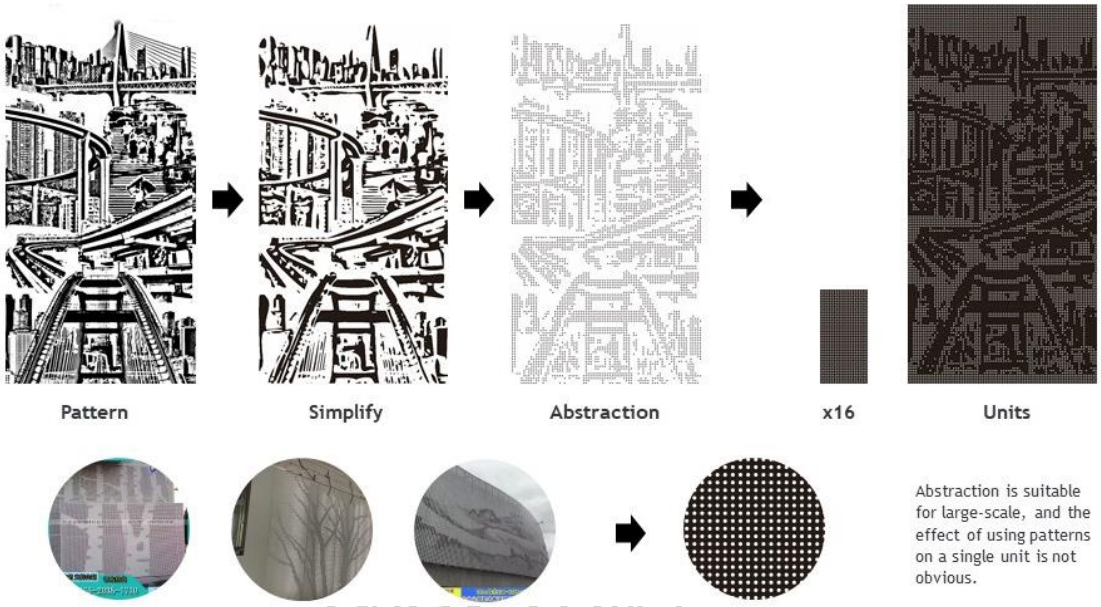

Figure 122. Pattern (Transportation) Abstraction Process

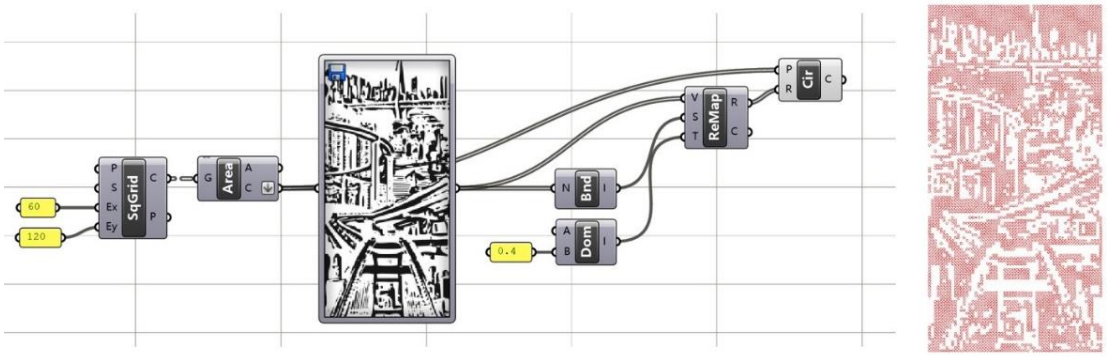

Figure 123. Operation Process of Rhino and Grasshopper

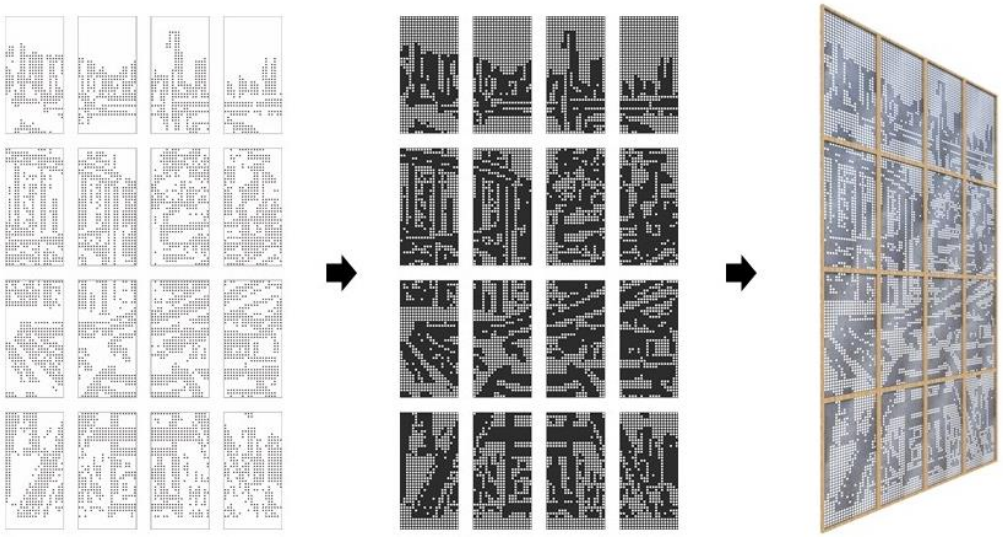

Figure 124. Application (Transportation) of Different Size

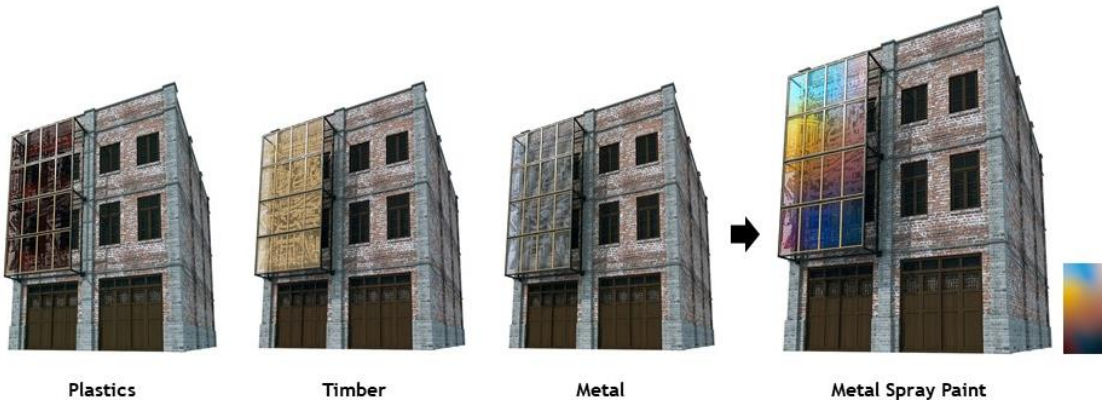

Figure 125. Application (Transportation) of Different Material

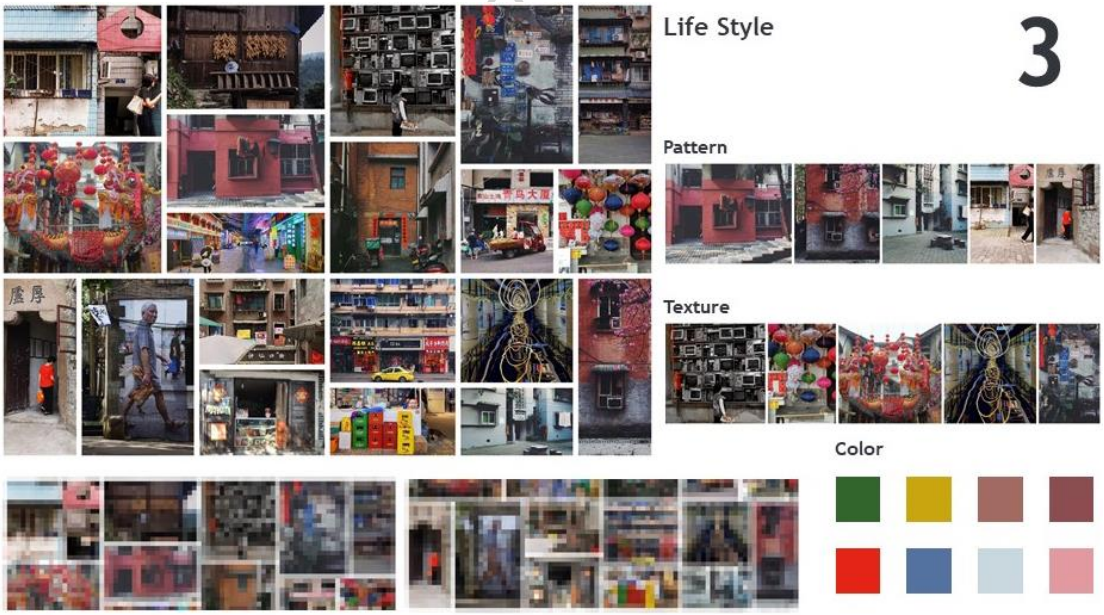

Figure 126. Life Style

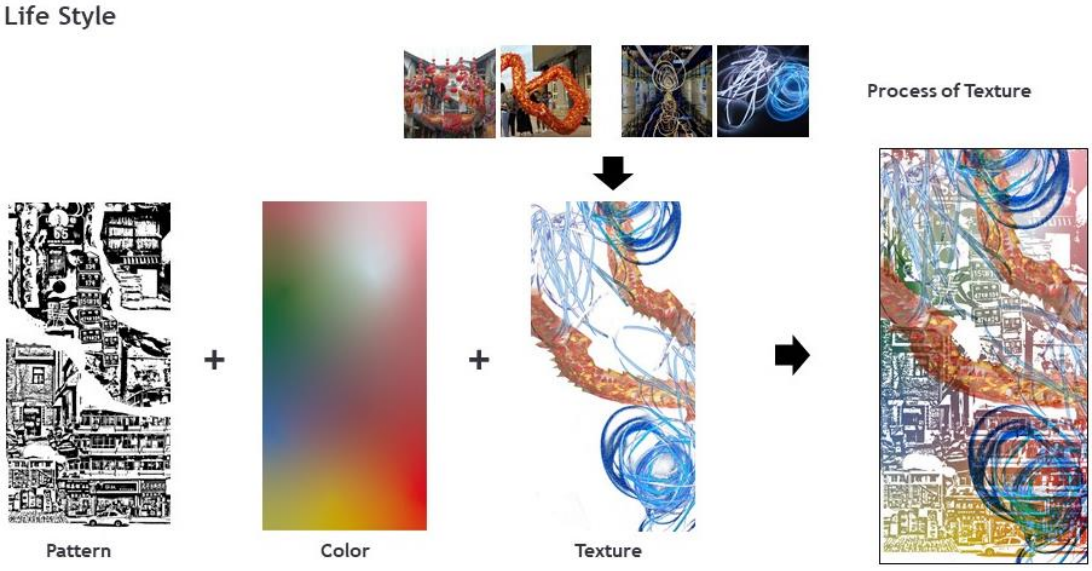

Figure 127. Element (Life Style) Creation Process

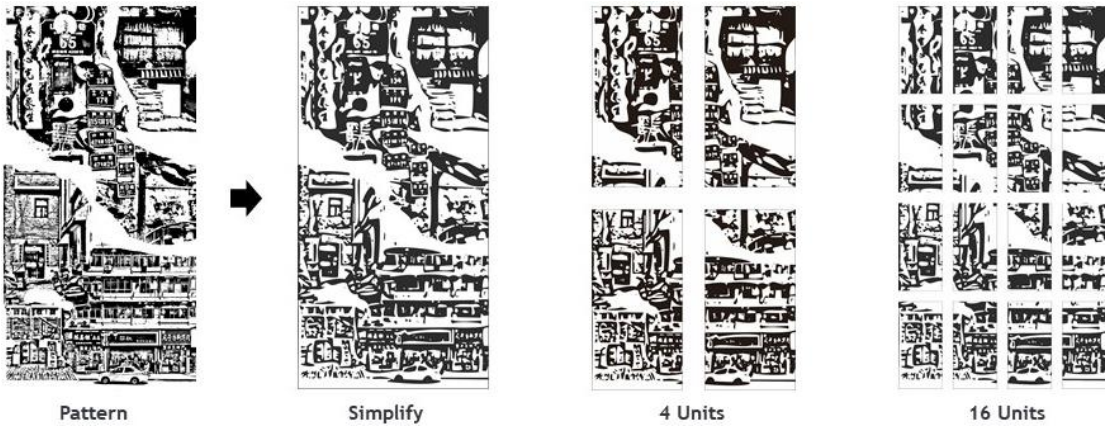

Figure 128. Pattern (Life Style) Abstraction Process

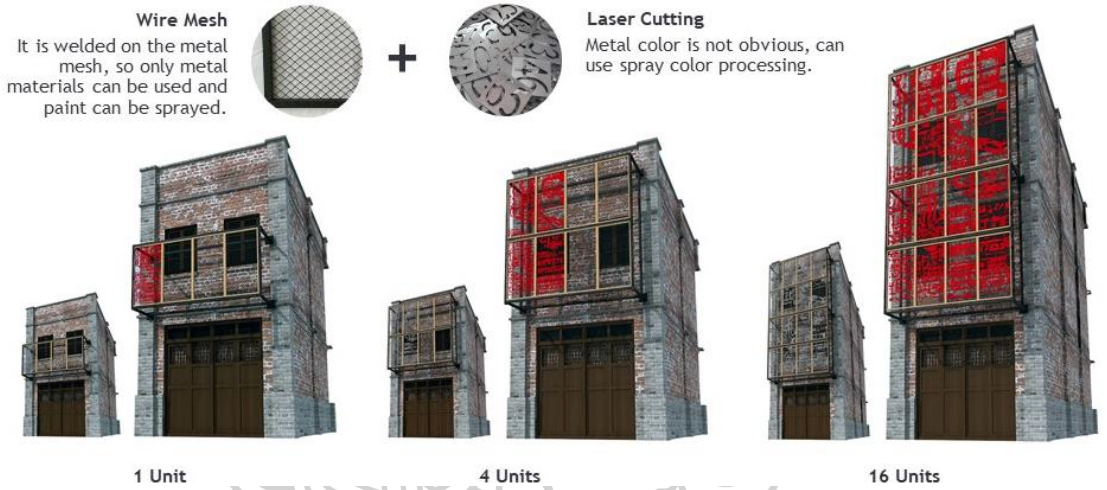

Figure 129. Application (Life Style) of Different Size

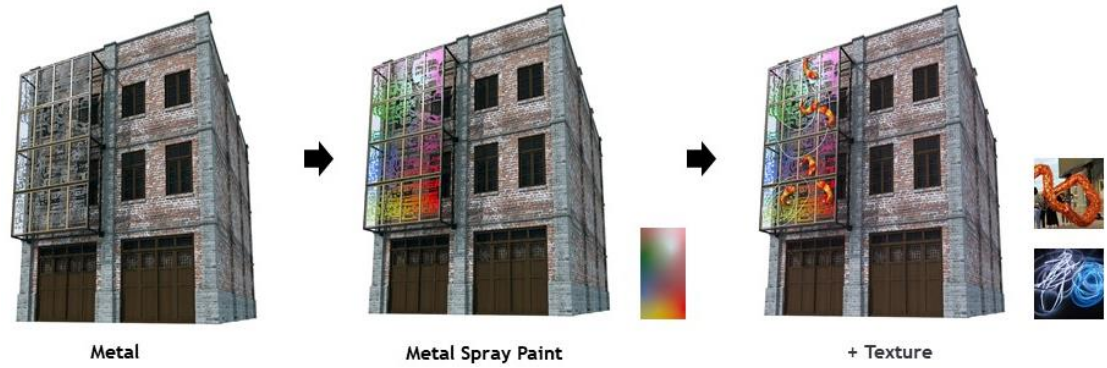

Figure 130. Application (Life Style) of Different Material

5.3.3 Local Art for Co-creation

Using collage art to collect the main elements of the city, according to the rules and principles found in the front, focusing on city architecture, transportation and city life. The second step is to adopt the expression methods of post-modern art and contemporary art, and choose the overlapping art forms.

Combined with the composition principle of Chinese painting art, it realizes the transformation from traditional aesthetic foundation to modern artistic expression. This form of expression is a common method in artistic creation. In the same way, the abstract representation is used to realize the conversion from overlapped images to linear images. In the classic design principles and design elements, the basic unit of design are point, line, surface and body. This realizes the transformation from image to artistic expression, to abstract as design elements. Then the parametric technology and laser cutting technology are applied to complete the design and practice of the pattern to the building surface material. (Figure 131, 132, 133, 134)

Figure 131. Collage of City Images

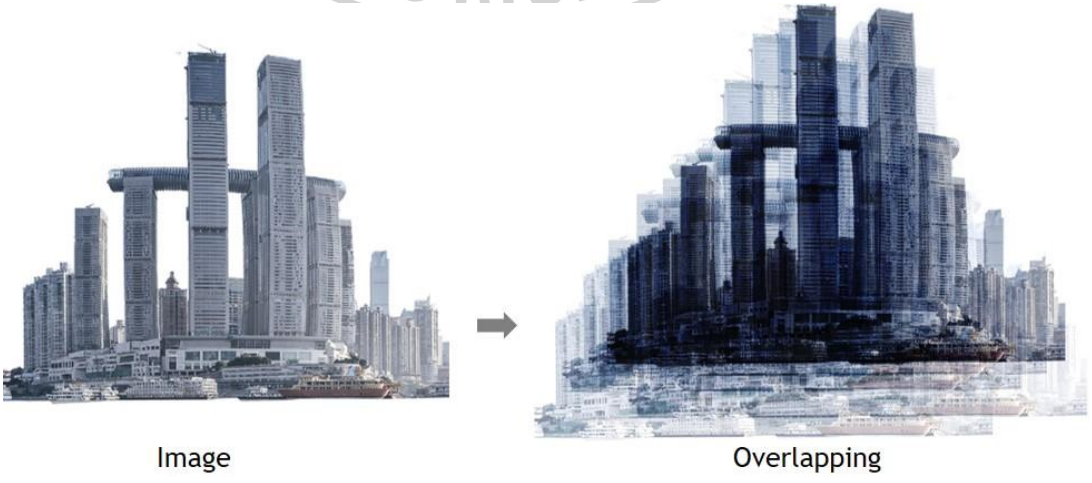

Figure 132. Overlapping Postmodern Art Expression

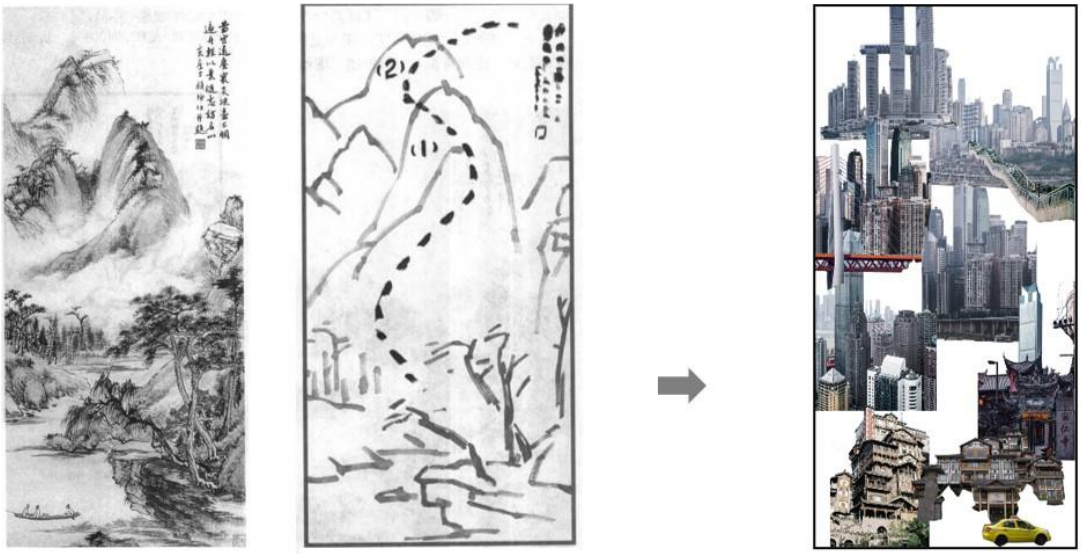

Figure 133. Using Chinese Form as the Composition of Collage Art

Figure 134. Application Process from Art pattern to Architectural Surface

From Chongqing's unique traditional art forms to find a deeper combination. Chongqing Liangping New Year pictures are based on traditional Chinese prints and one of Chongqing's intangible cultural heritage. There are some similarities between the traditional form of Chinese printing and the postmodern form of silk-screen printing in contemporary art. They all use black and white images, and the composition of Chinese prints is full, which is the connection with the form of decorative arts. China's printmaking is centered on a single theme, so the most

representative city characteristics are selected as the objects of performance. Chaotianmen modern architecture group and Hongyadong traditional architecture group, which are the most representative buildings in Chongqing, are selected as the creation objects, combined with traditional humanistic elements, such as dragon and lion dance. Then the Chinese characters are the symbol of the largest amount of information, in the form of traditional printmaking, integration. Finally, the blank part of the application of print lines for decoration, improved the work. At this stage, professional illustrators are invited to design together to realize the cross-border cooperation between artists and designers. At the same time, combined with the participation of residents in the basic stage of co-creation, the cooperative model of residents, designers and artists can be established. (Figure 135, 136, 137, 138, 139, 140)

Figure 135. The Process of Local Art Intervene in Creation

Figure 136. Co-creation with Cultural and Creative Products

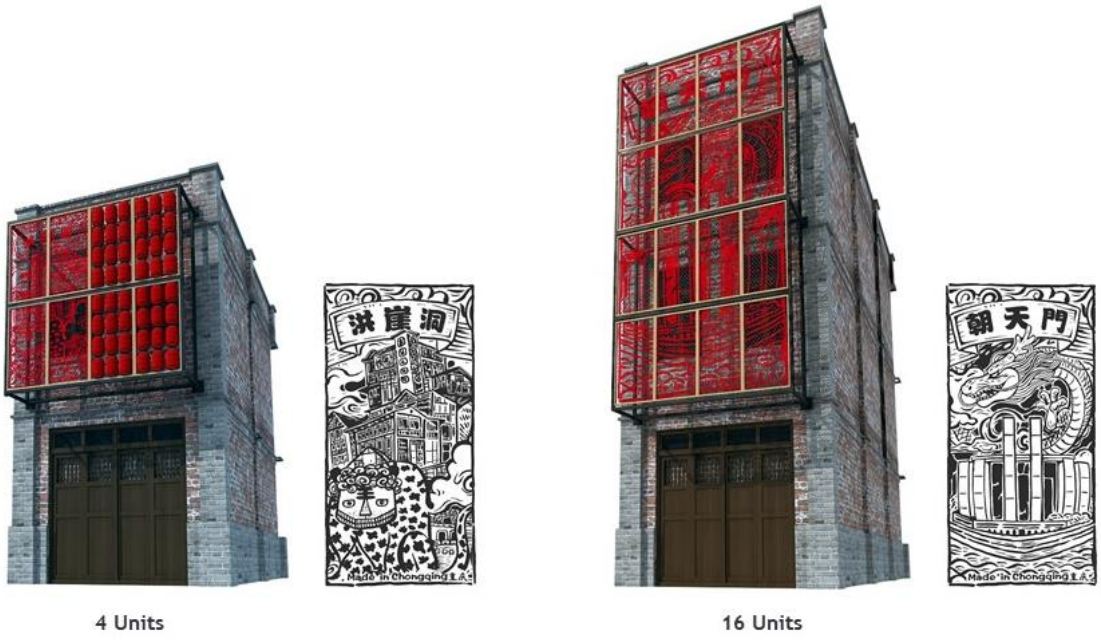

Figure 137. Chinese Printing For Elements Creation

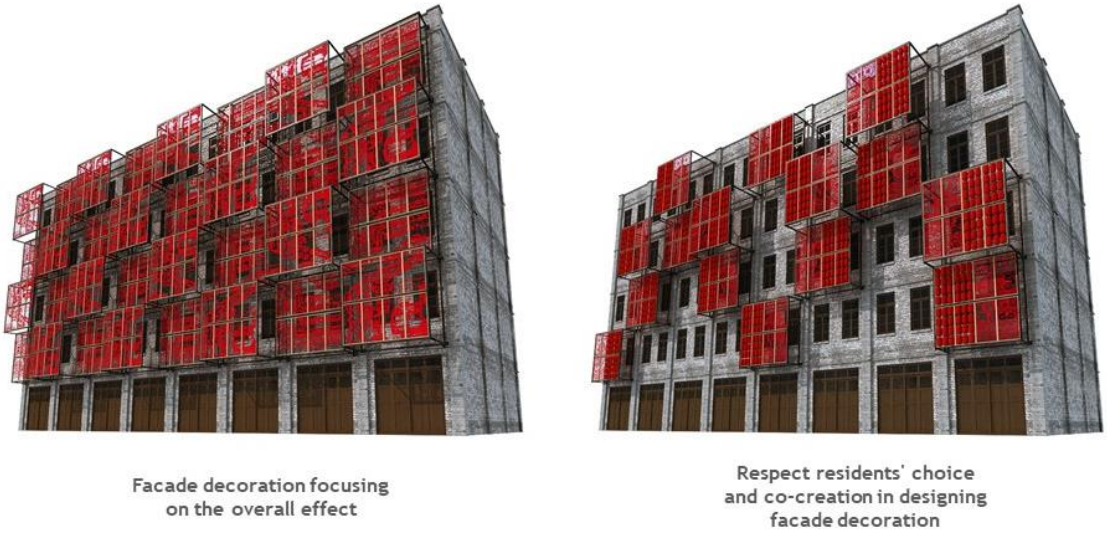

Figure 138. Different Application Methods in Old Building

Figure 139. The Co-creation of Residents and Artists

Figure 140. 3D Rendering of Comprehensive Application

Chapter 6 Conclusion

6.1 Restatement and Results

Urban development is not static, it is a complex dynamic process, like metabolism. The efficient construction mode that resulted from the rapid development and expansion of cities, especially in the beginning of modernist architecture, has rapidly increased the number of new buildings. Meanwhile, old buildings cannot meet the material needs of people. The renewal period of buildings is shortening, and new buildings cannot fully replace old ones (Rowe, 1984). The death of the old is accompanied by the emergence of new things, and it is a state of coexistence for a long time (Ellin, 2013). This is the case with the buildings in the city, especially in the old urban areas. A large number of old buildings exist, and it is impossible for new buildings to completely replace them. These old blocks represent the context, memory, and character of the city (Rowe, 1984). It is the key to solve urban problems to seek the integration relationship of the old urban area with new buildings.

An increasing number of urban planners and architects are realizing that the regeneration of old buildings is the sole means of urban development (Caves, 2005). In the process of renovation, architects generally use conventional methods of architectural design, which ignore the differences between old and new buildings and disregard the needs of residents in old buildings. Similarly, they also ignore that the residents living in it are the stakeholders in the renovation and renewal of old buildings.The primary demand of residents for renovation is a functional improvement, followed by beautification of appearance. To meet basic living needs, residents transform and repair the facade of old buildings in a simple way usually by using low-cost building materials and recycled garbage. This method lacks aesthetics and destroys the original style and features of the street.

Although this kind of spontaneous transformation, like an urban patch, destroys the consistency of the urban environment in the popular aesthetic, it creates another interesting phenomenon of resisting the template of the modern city. Modernist architecture and Internationalist architecture have made our city lose its

social vitality (Jane Jacobs, 1961) and obliterate the old urban blocks whose diverse architectural forms express the unique local lifestyle (Caulfield, 1994). If the theory of collage city tries to connect the history of history again by collage (Rowe, 1984), the residents' hand-made collage is the perfect application of postmodern art in modern urban blocks.

From the theory and phenomenon, from the perspective of stakeholders, it is concluded that the main problems is residents spatially repair the facade of the old buildings, destroying the city aesthetics. From this, we can get the research objectives, questions and develop research methods. The research objectives include:

1). To analyze co-creation in the surface decoration of old buildings.

2). To create co-creation method to realize the art intervention in the old building surface decoration.

3). To test the co-creation method in Chongqing Xiahao Street.

The first goal is to define the concept, which needs to answer how to realize co-creation in the surface decoration of old buildings. The study mainly adopts the methods of literature review and case study, and the result is art intervention as a decoration method.

The second goal is the core of the research and three sub-objectives are derived from it. To select art form to realize co-creation; to develop art transform into decoration for co-creation; and to evaluate co-creation method with residents. For the three secondary goals, we need to answer the following questions: what art form is used to realize co-creation; how to transform art into decoration for co-creation; and how to organize co-creation with residents. It takes participatory action research as the methodological framework, adopts the workshop method as the main method, and combines various methods such as field investigation, interview feedback and design practice. The result is principles and organizational methods for co-creation.

The third goal is to evaluate and verify, which needs to answer how to apply co-creation in Chongqing Xiaohao street. The study mainly adopts the method of design practice, comprehensively applies the practice collection of architectural

design technology and co-creation, and the result is the design project of Chongqing Xiahao street.

The study analyzes the problem from the perspective of participatory behavior research, and the most important one is to define the stakeholders. The research adopts co-creation with residents as the main body rather than participatory design or co-design. Co-design is more likely for designers to complete design projects, and residents only participate in them. Co-creation is a kind of cooperation with residents as the core and designers as the assistant. Residents are the main participants to participate in the early, middle and later stages of co-creation with different identities. Whether the residents can choose the location independently needs cooperation and cooperation time, and if they are not satisfied in the later stage, they can cancel the cooperation. The research method takes the cycle model of participatory behavior research as the research framework, and adopts the method of the workshop to seek to establish the co-creation mode with residents as the core.

The surface decoration of old buildings is the research field. Firstly, the literature defines the difference between old buildings and historical buildings, and defines the old buildings without historical protection value as the main body of transformation. Then from the Renaissance building facade separated from the whole building, to the modern building surface independent from the building structure. This paper analyzes the development process of building surface and the change of building surface function, which is the theoretical basis of old building renewal from the skin. The definition of building skin is also the theoretical basis of the classification of old buildings. The biggest demand of modern urban streets for transformation is the old buildings of modern architectural structure. The complete separation of building structure and building skin is the theoretical basis of the old building skin renewal of modern building structures.

Art intervention is the method of architectural renewal. Literature first defines the application of art expression in architecture, from the new art movement to the style school, and finally finds the similarity between artworks and architectural skin decoration from contemporary art. From the development and change of post-

modern architecture, find out the law of building surface from reappearance to non-reappearance, and conclude that the development trend of future architecture is the reappearance of human emotion. Combined with the current methods of art intervention in public art, it is concluded that art intervention in building surfaces is the representation of human emotion in building surfaces, and provides the theoretical basis of art intervention as a method.

6.2 Discussion

The emergence of postmodern architecture is the opposite of modernist architecture. The early masters of postmodernism declared war on modernism with exaggerated expressionism, and the symbolic combination of collages made the building an exaggerated stage set in the city, such as Charles Moore's Plaza Italia. From the early *The Language of Post-Modern Architecture* to *What is Post-Modernism*? (Jencks, 1991, 1996), Charles Jencks illustrates that postmodern architecture is the inheritance and development of modernism, not the opposite. Postmodern architecture is a series of experimental building entities in the process of complex changes. It is not a system, and there is no standard construction model. It can be seen as a process of improvement and speculation depending on the modern architecture system, and this process is still going on. From the late 1970s to the early 1980s, the decoration method of historical eclecticism was the initial form of post-modernism. Using historical symbols to explore and convey the meaning of architecture. At this time, the architectural significance is reduced, and the historical style is not a part of the whole society. This is only part of the elite's exploration of modern architecture, which can be understood as the memory and representation of historical achievements.

6.2.1 From Postmodern to Local Art

Local art intervention to the artistic creation of the local people, and also includes the people who live here. Local art is not limited to tradition, it is the result of various artistic styles precipitated by local people's habits and ways of thinking. It reinterprets the local culture, which is unique, national and pure. It is an original local art form and a form of integrated development of traditional culture.

Local art is not an absolute localization because of the blurring of regional boundaries; it has increasingly integrated into the field of internationalization and is a central part of internationalization. Globalization, on the other hand, is a double-edged sword for local art. Globalization has the potential to not only significantly encourage local art creativity and growth, but also to gradually blur and lose the connotation and self-renewal capacity of local art. The scope of its range is also expanded, traditional folk art performance or modern art school performance; can be static painting art, and can also be dynamic dance art. Local art intervention deepens the concept level of art intervention and expands the connotation of architectural surface regeneration. Local art intervention adds artists to the co-creation design mode of designers and residents. This is the advanced stage of modular elements. It is not only the formal image that represents the characteristics of the city, but also the artistic conception of the modular elements that are integrated into the city.

6.2.2 Artists in Co-creation

In the context of post-modernism, contemporary art forms such as installation art and performance art make ordinary people feel that the boundary between art and life is not so obvious (Spring, 2014). In the eyes of artists, the objects in daily life and the forms created by ordinary people, under certain environmental conditions, are also works of art. The reality is that to maintain the most basic functional needs, residents use low-cost materials to improve their living conditions. Artists can see the beauty of non-conventional materials in part, such as the new and the old, the hard and soft, the collision of colors, etc. These are the inspiration sources in artistic creation. However, the reconstruction projects completed by the residents by chance cannot coordinate the relationship between the locals and the environment as a whole. Of course, the residents pursue the basic aesthetic feeling under the condition of the functional requirements of the transformation. However, the residents do not have enough understanding of beauty. Such reconstruction projects are more likely to cause damage to the context of the block, confusing the overall style.

6.2.3 City Culture in Co-creation

In the definition of American postmodernist architect Jane Jacobs, urban culture (or city culture) is a kind of cultural phenomenon produced by a large number of different strangers in a very limited urban space (Jane Jacobs, 1961). They influence each other through proximity, but they are relatively independent. People in the long-term life phase construct urban culture, which is a cultural paradigm of urban characteristics. It's the amount of the city's climate, culture, and customs. Urban culture mainly includes three levels. The first is the historical tradition and social development of the city. The change of urban society is a major cultural issue. Its external manifestation is urban construction and the human landscape. The second is the cultural construction and cultural products of the city, which is the state of urban culture reflected in the narrow or common sense of culture. Third, the lifestyle and quality of life of citizens are the deep foundation of urban culture (Yang, 2006).

The historical tradition is the inner foundation of the city, the cultural symbol is the external manifestation of the city, and the material life of the residents is the material basis of the city. These three aspects correspond to the co-creation, which shows the aesthetic characteristics and inner temperament of the city with art, transforms the art into the temperament of the design in line with the contemporary urban style, and shows the urban lifestyle through the process of residents' participation in the cooperation. Looking for the essence of the city through the social phenomenon, when we find that the results of residents' spontaneous repair of the building surface can produce a post-modern artistic effect, there is actually a cultural phenomenon in the city. The surface of easily accessible waste materials is the symbol of the contemporary city, and the repair of the building surface is also the basic pursuit of urban material life. Therefore, co-creation takes urban culture as the carrier, and art intervention takes urban culture as the element.

6.3 Contribution

In theory, the research has solved that under the current background, the designer assists the residents in realizing the beautification of the surface of the old building with artistic intervention. Take participatory action research as a framework,

especially to make a new definition of participants in participatory action. Residents are the core of the assisting design process and can participate in all stages of co-creation. The designer is the assistant and guide of the co-creation, helping the residents to complete it. The artist is an advanced level of co-creation and can enhance the aesthetic level of design. The action involved is to realize the surface decoration of the old building using art intervention. Contemporary art intervention is an effective way to realize the beautification of the architectural surface, which is proved from the historical perspective and current practice. Architectural technology is a necessary condition to maintain the structure and function of the building. In research and practice, modular frame retrofitting is used to realize the building structure of the old building surface decoration. City culture is the inner spirit of the continuation of architecture, and can represent the temperament and aesthetic characteristics of the city. It can be seen that the participants of co-creation are residents, designers and artists. The actions of co-creation are complex behaviors based on art, technology and city culture. (Figure 141)

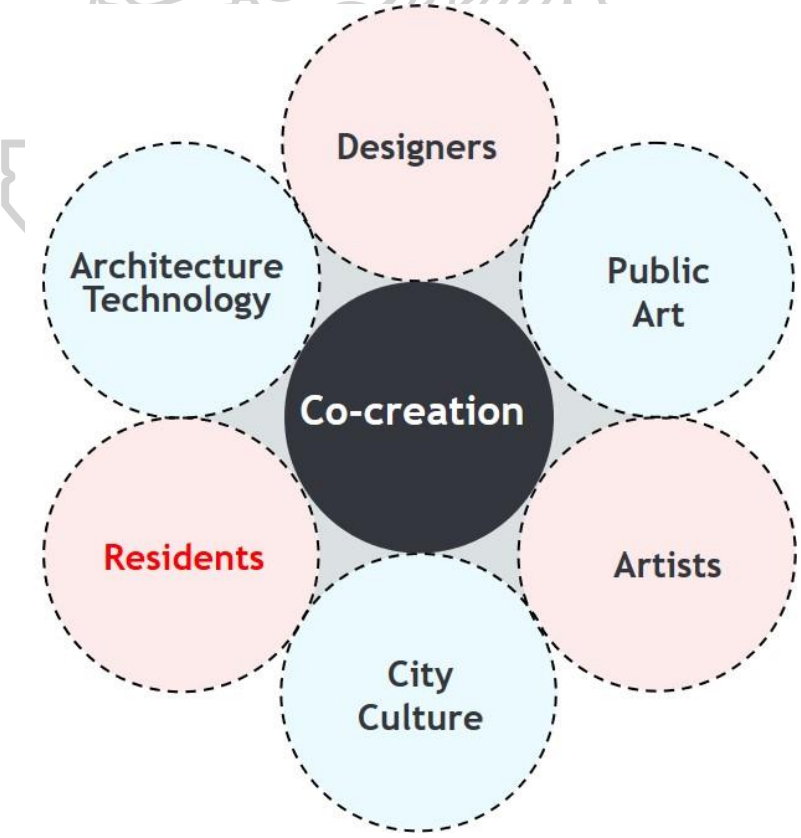

Figure 141. New Co-creation with Residents

In practice, the practice method of transforming art into design symbols was established, and the principle of organizing residents to cooperate in design was established. Using the method of workshops and the cooperation mode of artists and designers, we found a suitable method of artistic expression to express the cultural characteristics of the city, and obtained the means of transforming the artistic mode into abstract design symbols for the decoration of the building surface. In the same way, using the workshop method and the cooperation model between designers and residents, we find practical and effective methods, through education and guidance, cooperate with residents to complete co-creation, and summarize and complete the guiding principles and methods of co-creation. In the design practice, the application of architectural modularization technology and the co-creation method of residents have realized the reconstruction plan of the old street in Chongqing. In practice, it has been verified that the co-creation mode of residents and construction technology can be combined.

There are three levels of co-creation for residents as the core, including: 1). Design to residents' co-creation; 2). Design from residents' co-creation; 3). Local art for co-creation. They are the basic level, medium level and high level. (Figure 142, 143, 144)

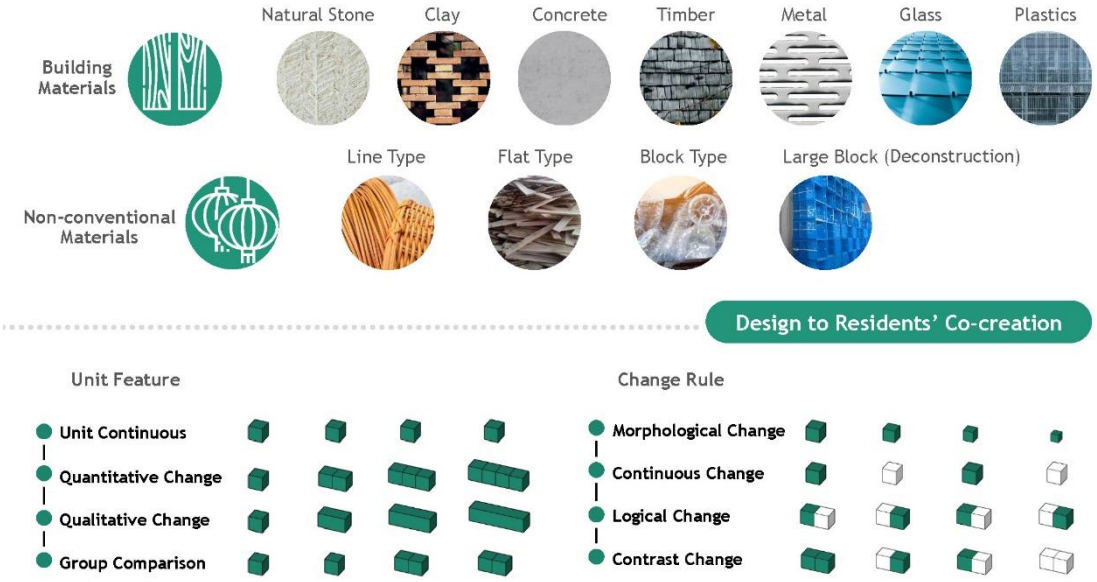

Figure 142. Design to Residents' Co-creation

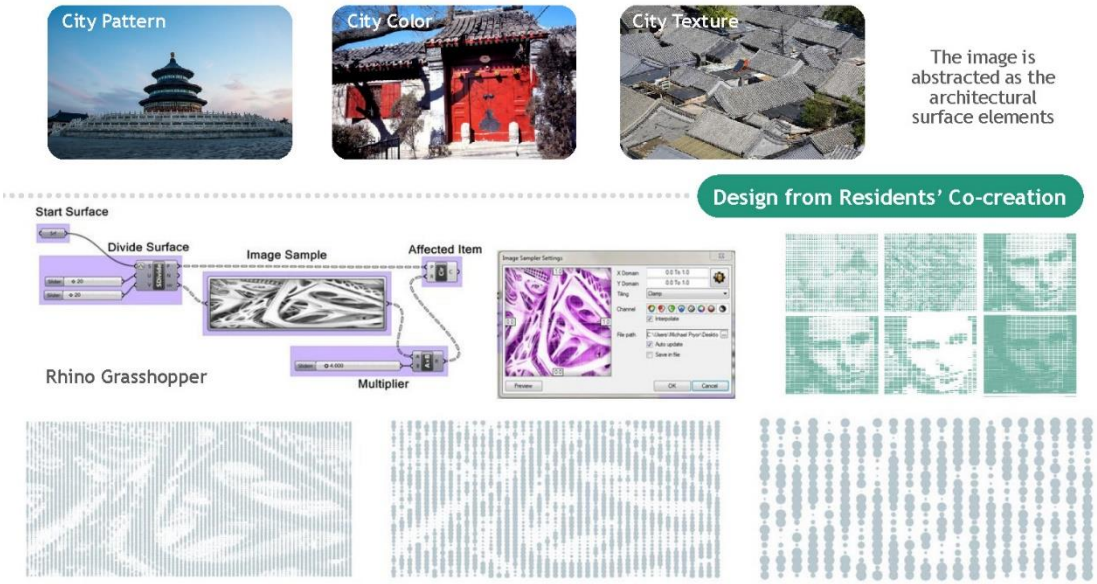

Figure 143. Design from Residents' Co-creation

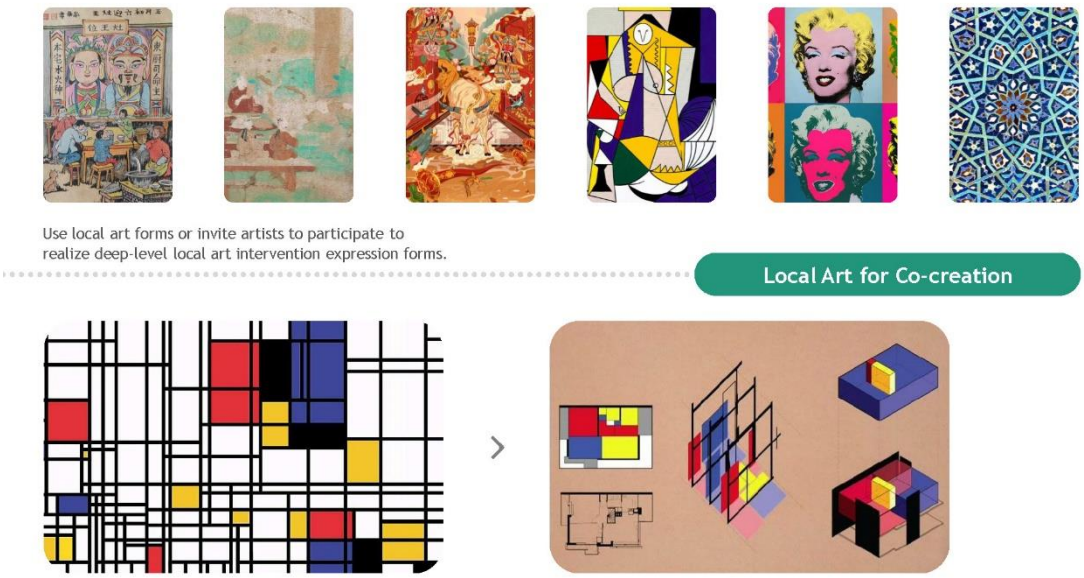

Figure 144. Local Art for Co-creation

The process of abstraction and simplification of city image pattern is too complex for residents to participate in the core co-creation design. Residents' participation is the basic level, which is mainly the repeated combination of pattern elements and existing non-conventional materials. Participation focuses on the process of co-creation and the sense of belonging to the street. In the medium level of the creation of the pattern elements of city characteristics, the participation of residents is mainly based on the shooting and selection of city images, which is also

in line with the feedback of residents at the basic level. The pattern elements of post-modern mode image reflects the modern urban style, but lacks the local art expression form. It is a high level of the pattern elements to explore the local representative art forms and let the local art intervene in the reconstruction of building surface, so that the co-creation of residents and designers can become the co-creation of residents, designers and artists, and the design level will be richer.

6.4 Recommendation

The limitation of participatory action research makes design research suitable for solving specific problems, and the setting of co-creation mode of residents' combination is to solve the universal problem of old building transformation adapting to the new urban environment under the rapid development of urban architecture. The overall study only uses Chongqing Xiahao street as a practical case to verify that the combination of co-creation mode and modular architectural design is used in the reconstruction of old buildings. However, different cities, different communities and different methods of building technology have not yet carried out more extensive design verification, which is not convincing enough. In the later research, we will continue to carry out workshops and practice design with the existing modules to verify the effectiveness of co-creation as a problem-solving method.

Art intervention only involves the most basic aesthetic of residents, using students as art practitioners, connecting residents and designers as disseminators of module element creation, the positive role of art intervention has not been fully played. The cooperation of selected artists is relatively independent, not fully involved in the process of co-creation. In the later stage of research and development, the co-creation mode of artists and residents will be carried out to realize the purpose of art driving emotion and emotional activation of old blocks.

In the practice of old building transformation, the architectural design principle of a modular system is used as technical support, and co-creation as a method can also cooperate with other building technologies to complete the transformation practice of old building surfaces. If the co-creation of residents' participation meets the construction conditions of the new building facade, it is also

suitable for the construction of new buildings. The core of the research is the co-creation model of residents' participation. In the later research, it will take the cooperative design mode as the core method, expand to other architectural design-related principles and technologies, and carry out the co-creation research of new buildings. The stakeholders are pre-set in the building, so that the facade design of the building can be just like the interior decoration, and the stakeholders can participate in the design and decoration of the building surface.

In the level setting of stakeholder participation in participatory action research, the self-mobilization model is the highest stage of PAR. The co-creation model extends the iterative process of design. The design activity is not only to complete the transformation design, but also to design a framework system conducive to residents' self-mobilization in the later stage, which is the next research direction. Residents have the intention of self-mobilization. Within the limited scope, residents can create the architectural surface decoration independently. In the early stage of design, the renewal link is considered, so that the updated decoration effect will not damage the overall style of the building, but will make the building form a certain difference in a unified and coordinated environment, which is the embodiment of the original environment culture and history. Co-creation aims at the self-renewal of the residents in the later stage of the building, extends the design steps in the design process, and is the development and supplement of iterative design. Iterative design is not only to increase the verification link of product development, but also to update and transform the product itself, which is the development trend of repeated design.

REFERENCES

Alberti, L. B. (1986). *The Ten Books of Architecture: The 1755 Leoni Edition*. New York: Dover Puplications.

Alexander, C., Beale, N., Kesby, M., Kindon, S., McMillan, J., Pain, R., & Ziegler, F. (2007). Participatory diagramming: A critical view from North East England. In *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place*. https://doi.org/10.4324/9780203933671-26

Almusaed, A., & Almssad, A. (2019). City Phenomenon between Urban Structure and Composition. In *Urban Design*. https://doi.org/10.5772/intechopen.90443

Baudrillard, J. (1983). *Simulations*. Los Angeles: Semiotext(e).

Bédard, J. F. (1994). The measure of expression: Physiognomy and character in Lequeu's "Nouvelle Methode." In *Chora 1: Intervals in the Philosophy of Architecture*. Montreal: McGill-Queens University Press.

Berlage, H. P. (1996). *Hendrik Petrus Berlage: Thoughts on Style, 1886-1909*. Santa Monica: The Getty Center For The History Of Art.

Berlin in Brief: History. (n.d.). Retrieved from https://www.berlin.de/berlin-im-ueberblick/en/history/the-fall-of-the-wall-and-reunification/

Bertens, H., & Fokkema, D. W. (1997). *International Postmodernism: Theory and literary practice*. Amsterdam: John Benjamins Publishing Company.

Better, M. S. (2018). Understanding the careful urban renewal and critical reconstruction of Berlin: eco-projects of the Internationale Bauausstellung 1987. *EAUH*.

Blanco-M, A. (2020). Co-creation , Co-design and Co-production, Similarities in Their Definition. Retrieved from https://www.projectco3.eu/2020/10/26/co-creation-co-design-and-co-production-similiraties-in-their-definition/

Brooks-Harris, J. E., & Stock-Ward, S. R. (1999). *Workshops: Designing and Facilitating Experiential Learning*. Thousand Oaks: SAGE Publications.

Broudehoux, A. M. (1994). *Neighborhood Regeneration in Beijing: An Overview of Projects Implemented in the Inner City Since 1990*. Montreal: McGill University Libraries.

Caulfield, J. (1994). *City Form and Everyday Life: Toronto's Gentrification and Critical Social Practice*. Toronto: University of Toronto Press.

Caves, R. W. (2005). *Encyclopedia of the City*. Abingdon: Routledge.

Chaslin, F., & Picon-Lefebvre, V. (1989). *La Grande Arche de La Défense*. 215.

Chevalier, J. M., & Buckles, D. J. (2019). *Participatory Action Research: Theory and Methods for Engaged Inquiry*. Abingdon: Routledge. https://doi.org/10.4324/9781351033268

Corbusier, L. (2013). *Towards a New Architecture*. New York: Dover Publications.

Crane, P., & Richardson, L. (2000). *Reconnect Action Research Kit*.

Donnelly, J. E. (2018). *The Physiognomy of a Collection: Architectural Legibility and Historical Expression at the Musée des monuments français, 1795-1816*. University of Pittsburgh.

Ellin, N. (2013). *Integral Urbanism*. New York: Routledge.

Feng, L. (2008). *Contemporary Surface Architecture: The Correspondence Between Surface and Space*. The University of Sheffield.

Frampton, K. (2001). *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*. Cambridge: The MIT Press.

Frayling, C. (1993). Research in Art and Design. *Research Papers*, *Volume 1*(Royal College of Art).

Ghirardo, D. (1996). *Architecture after Modernism*. London: Thames & Hudson.

Giedion, S. (1959). *Space, Time and Architecture: The Growth of a New Tradition*. Cambridge: Harvard University Press.

Grand Arche de la Défense. (n.d.). Retrieved from http://paris.dukegill.com/defense.htm

Hämer, H.-W. (1990). 12 Principles of Cautious Urban Renewal. Retrieved from https://www.internationale-bauausstellungen.de

Hara, K. (2007). *Designing Design*. Zurich: Lars Müller Publishers.

Highfield, D. (2003). *The Construction of New Buildings Behind Historic Facades*. London: Taylor & Francis e-Library.

ICOMOS. *The Venice Charter 1964*. , (1965).

ICOMOS, T. A. *The Burra Charter*. , (2013). Australia.

Inoue, M. (1998). Evaluation of Local Resource Management Systems as the Premise for Introducing Participatory Forest Management. *Journal of Forest Economics*, *44*(3), 15–22. https://doi.org/10.20818/jfe.44.3_15

Inoue, M. (2004). *Guidelines and Recommendations for Participatory, Sustainable Forest Use and Management*. IGES.

Islami, S. Y. (2009). *The Architecture of Surface: the Significance of Surficial Thought and Topological Metaphors of Design*. The University of Edinburgh.

Jameson, F. (1991). *Postmodernism, or, The cultural logic of late capitalism*. Durham: Duke University Press.

Jane Jacobs. (1961). *The Death and Life of Great American Cities*. New York: Penguin Random House.

Jencks, C. (1982). *Free-style Classicism*. Minnesota: Architectural Design.

Jencks, C. (1991). *The Language of Post-Modern Architecture*. New York: Rizzoli.

Jencks, C. (1996). *What is Post-Modernism?* Cambridge: Academy Press.

Kaufmann, E. (1952). *Three Revolutionary Architects: Boullee, Ledoux, and Lequeu*. Philadelphia: American Philosophical Society.

Kipnis, J. (1997). A Personal Reflection on the Architecture of Herzog & de Meuron. *El Croquis 84*.

Kristeller, P. O. (1964). The Modern System of the Arts. *Renaissance Thought II*.

Leatherbarrow, D., & Mostafavi, M. (2002). *Surface Architecture*. Cambridge: The MIT Press.

Lewin, K. (1946). Action Research and Minority Problems. *Journal of Social Issues*, (2), 34–46. Retrieved from http://bscw.wineme.fb5.uni-siegen.de/pub/nj_bscw.cgi/d759359/5_1_ActionResearchandMinortyProblems.pdf

Liepe, S., Poppitz, M., Scheffler, N., & Sept, A. (2010). *Wissenschaftliche Studie IBA '87 in Berlin*. Berlin: Senatsverwaltung für Stadtentwicklung Berlin.

Loos, A. (1982). *Spoken into the void : collected essays, 1897-1900*. Cambridge: MIT Press.

Loos, A. (1998). *Ornament and Crime: Selected Essays*. Riverside: Ariadne Press.

Mallgrave, H. F. (2006). *Architectural Theory Volume I An Anthology from Vitruvius to 1870*. Cambridge: Blackwell.

McIntyre, A. (2007). *Participatory Action Research*. California: Sage Publications.

Miles, M., & Hall, T. (2005). *Interventions: Advances in Art and Urban Futures*. Bristol: Intellect Books.

Moughtin, C., Oc, T., & Tiesdell, S. (1995). *Urban Design: Ornament and Decoration*. Oxford: Butterworth-Heinemann.

Pierce, T. J. (2015). *College*. Oxford: Oxford University Press.

Plattner, H., Meine, C., & Leifer, L. (2012). *Design Thinking Research: Studying Co-Creation in Practice*. London. https://doi.org/10.1007/978-3-642-21643-5

Raizman, D. (2010). *History of Modern Design*. New Jersey: Pearson Prentice Hall.

Reason, P., & Bradbury, H. (2008). *The SAGE Handbook of Action Research Participative Inquiry and Practice*. Sage Publications.

Rosier, K. (2015). Participatory Action Research. Retrieved from CFCA website: https://aifs.gov.au/cfca/publications/participatory-action-research

Rowe, C. (1984). *Collage City*. Cambridge: The MIT Press.

Schuler, D., & Namioka, A. (2009). *Participatory Design: Principles and Practices*. Hillsdale: Lawrence Erlbaum Associates.

Schumacher, T. L. (1987). The Skull and the Mask: The Modem Movement and the Dilemma of the Facade. *Cornell Journal of Architecture*.

Self-Construction Experiment Wohnregal. (n.d.). Retrieved from https://www.internationale-bauausstellungen.de

Semper, Gottfied. (2011). *The Four Elements of Architecture and Other Writings* (Reissue). Cambridge: Cambridge University Press.

Semper, Gottfried. (2004). *Style in the Technical and Tectonic Arts, Or, Practical Aesthetics*. Los Angeles: Getty Publications.

Shields, J. A. E. (2014). *Collage and Architecture*. New York: Routledge.

Somers, M. (2019). Emotion AI, Explained. Retrieved from https://mitsloan.mit.edu/ideas-made-to-matter/emotion-ai-explained

Spring, J. M. (2014). *Unexpected Art: Serendipitous Installations, Site-Specific Works, and Surprising Interventions*. San Francisco: Chronicle Books.

Stern, R. A. M. (1977). *New Directions in American Architecture*. New York: George Braziller.

Stern, R. A. M., & Gastil, R. W. (1988). *Modern Classicism*. New York: Rizzoli.

Sterner, G., & Fahr-Becker, G. (1982). *From Individualism to Mass Society*. Hauppauge: Barrons Educational Series Inc.

Venturi, R. (1966). *Complexity and contradiction in architecture*. New York: The Museum of Modern Art.

Venturi, R., Scott, D., & Steven, B. (1988). *Learning from Las Vegas*. Cambridge: The MIT Press.

Waste, U. (n.d.). Urban Metabolism. Retrieved from http://www.urban-waste.eu/urban-metabolism

Wilde, O. (1982). The Decay of Lying (1889). In *The artist as critic*. Richmond: Alma Classics.

Windasari, N. A., & Visita, L. (2019). User engagement mechanisms of online co-design service: Does user innovativeness matter? *Asian Academy of Management Journal*, *24*(1), 59–82. https://doi.org/10.21315/aamj2019.24.1.3

Yamazaki, R. (2017). *The Era of All People Participating in Community Design*. Beijing: Ocean Publishers.

Yamazaki, R. (2019). *Community Design*. Beijing: Beijing Science and Technology Press.

Yang, D. (2006). *Urban Monsoon: The Cultural Spirit of Beijing and Shanghai*. Beijing: NEW STAR PRESS.

Zhao, R. (2005). *A Study on Contemporary Design Strategy of Western Architectural Form*. Southeast University.

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