The Relationship between Urban Memory and Typology: Utilizing Typology as a Design Tool to Preserve Urban Memory

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Abstract: Urban memory is the soul and vitality of the city, which is created and maintained by people's memory of the living environment. However, urban planning and architecture increasingly lose attention to urban memory, resulting in the loss of uniqueness of urban appearance, and then affect people's sense of identity of the city. Therefore, using the theory of typology for reference, a new design tool - urban memory typology is proposed, which focuses on and introduces historical elements into urban design, and maintains urban memory through the protection of cultural heritage. This method involves clarifying the intrinsic relationship between existing buildings and urban space through typology theory, identifying carriers of urban memory, and, on this basis, proposing strategies and technologies for urban renewal. This study verifies the validity of urban memory typology through case analysis, such as the conservation planning of Qingdao Old city. The results show that using the typology theory can protect the city memory, maintain the stability of the city form, and enhance the local identity of the residents, which is a new method of urban planning and design in line with the concept of humanistic care and sustainable development. This research work provides new theoretical guidance and practical strategies for the protection of urban memory and urban planning and design.

Keywords: Urban memory; Typology; Urban design; Protection of cultural heritage; Urban planning and design

1. Introduction

As a unique cultural and historical imprint of a city, urban memory plays an irreplaceable role in shaping our cognition and emotions towards the city. With the rapid development of urbanization, modern urban planning and construction often ignore the protection and inheritance of these memories, resulting in the loss of urban personality and residents' sense of local identity, which has a negative impact on social stability. This paper puts forward the application of typology theory in urban design to promote the protection and inheritance of urban memory with its unique advantages. Starting from structure and form, typology provides a new perspective and

tool to help us understand and protect urban memory and promote sustainable urban development by revealing internal laws and classifications. The validity and feasibility of this idea are verified by an example analysis. In short, urban memory typology brings a new concept to urban design, aiming to achieve the stable development and preservation of the uniqueness of the city through the protection of historical elements and memories.

2. Concept and importance of urban memory

2.1. Definition of urban memory

Urban memory refers to the collective memory of urban space, architecture, culture, and historical events accumulated through people's cognitive and emotional experience in the process of urban development [1, 2]. It covers not only the material heritage of the city, such as landmarks, historic districts, and cityscapes, but also intangible cultural elements, such as traditional customs, local legends, and social practices. These memories not only carry the historical and cultural value of the city, but also affect the identity and sense of belonging of the residents. The existence of urban memory makes the city unique and continuous, and becomes the core part of the city's soul. In the process of the rapid development of modern cities, urban memory is often neglected or destroyed, which leads to the homogenization of urban appearance and weakens residents' emotional connection and sense of identity to the city. The recognition and preservation of urban memory has become an important issue in urban planning and design, to preserve the character and history of cities, promoting psychological connections and preserving valuable cultural heritage for future generations [3].

2.2. Function and value of urban memory

Urban memory is an important part of urban culture, and its function and value are reflected in many aspects. Urban memory is not only a collection of common living experiences of citizens in a specific space, but also an important factor in shaping the uniqueness of a city. By carrying historical events, cultural practices, and social activities, urban memory promotes emotional cohesion within communities. Its existence enables the city to connect the past with the present in a living way, enhancing the historical continuity of the city. Urban memory enhances residents' sense of local identity and is also a great attraction to outside tourists, enhancing the tourism charm and economic potential of the city. In the context of rapid economic and cultural globalization, urban memory provides a means for cities to resist the trend of homogenization and maintain the diversity and individuality of cities. By preserving important urban memories, cities can not only continue their historical context but also maintain their unique identity in a rapidly evolving modern society.

2.3. Challenges of contemporary urban planning to urban memory

In the process of modernization, urban planning often takes development efficiency and economic growth as priority goals, ignoring the maintenance of urban memory. This trend leads to the increasingly serious homogenization of cities, the simplification of architectural styles, and the gradual forgetting or elimination of traditional neighborhoods and unique cultural elements. In the process of old urban renewal, excessive emphasis on function replacement may cause irreversible damage to historical buildings and original urban texture, and weaken residents' sense of local identity. This neglect of urban memory not only causes cities to lose their individuality but also affects the inheritance of historical and cultural values.

3. Overview of typology theory

3.1. Definition and development of typology

As an analysis tool and design method, typology originates from the development of philosophy and art, and its definition involves the classification and pattern recognition of things [4–6]. Typology is concerned with the similarities and differences between objects by identifying and classifying different types, to reveal the deep structure and law. In architecture and urban design, the use of typology aims to identify and perpetuate the historical and cultural character of a community or city. Its development can be traced back to the taxonomic studies of the 18th century, through the classification of architectural elements and styles, to help designers understand and inherit the traditions of the past. With the progress of The Times and the intensification of urbanization, the application of typology has gradually expanded to the study of the whole urban spatial structure, to meet the dual needs of cultural heritage protection and urban development. Through the study of existing architectural forms and urban space, typology method strengthens the dependence of design on historical context, makes the coexistence of old and new possible, and thus plays a crucial role in the protection of urban memory. This theoretical framework not only promotes academic research but also provides powerful guidance for urban planning practice [7].

3.2. Application of typology in architecture and urban design

As an analytical tool in architecture and urban design, typology provides a framework for designers to identify and interpret urban structures and architectural forms. By examining the type and formal language of architecture, typology helps designers understand the cultural and historical context of the existing environment, to incorporate these elements into the design process to maintain urban memory [8–10]. In urban design, typology promotes the preservation of historic buildings and traditional neighborhoods, supporting the harmonious coexistence of modern design and historical environment. This method emphasizes the continuity of architectural form and advocates following the morphological characteristics of existing urban space in urban renewal, providing theoretical support for urban design to maintain local characteristics and protect urban memory. The application of typology further promotes the sustainable development of urban planning and design.

3.3. Theoretical framework and main contributors of typology

The theoretical framework of typology originates from the systematic study of form and function in architectural and urban design, emphasizing the analysis of recurring design forms to reveal the internal relationship between spatial structure and human activities. In this area, Rossi was a key contributor to the development of the theory of typology, and in his book Typology of Architecture, he saw typology as a unique expression of collective memory based on the history and culture of the city. Krier further enriched the practical orientation of this theory through his research on classical urban forms. The theoretical framework of typology provides designers with an effective tool to maintain urban memory by analyzing and learning from historical forms.

4. The relationship between urban memory and typology

4.1. Typological characteristics of urban memory

As a complex social and cultural phenomenon, urban memory shows its unique characteristics from the perspective of typology. Typology identifies and analyzes the commonality between architecture and urban space to reveal its internal structure and development logic. The typology of urban memory emphasizes the attention to historical form and cultural connotation, which reflects the unique historical evolution and cultural accumulation

of the city through the identification and reconstruction of typical elements. This feature is not only reflected in the protection of historical buildings, but also in the inheritance and innovation of urban spatial organization forms. Under the framework of typology, urban memory is seen as a continuum with temporal depth and spatial breadth, which is both dependent on concrete material carriers and perpetuated through human activities and social interactions. The typological characteristics of urban memory not only help to understand the historical context of urban development but also provide important reference and guidance for future urban planning and design, ensure the coexistence of history and modernity, and inject sustainable vitality into the city.

4.2. Analyze the persistence of urban memory by using typology theory

Typology theory plays an important role in analyzing the persistence of urban memory. By identifying and classifying typical elements of architecture and urban form, typology helps to reveal the physical features that sustain the enduring memory of a city. This method can identify the carrier significance of historical blocks, landmark buildings, and traditional spatial layout for urban memory, to ensure that urban memory elements are not ignored in urban renewal and development. The typology theory can be used to analyze the relationship between the existing spatial structure and the historical context of the city, so that designers can maintain these internal connections in the planning and design, to realize the synchronization of functional modernization and cultural inheritance without destroying the urban memory. In this practice, typology not only helps to identify which urban spaces and architectural features are important carriers of urban memory, but also provides techniques and methods for urban design to maintain these features and effectively protect the continuity and stability of urban memory. In this way, urban planning can even enhance residents' sense of local identity, allowing urban memory to coexist harmoniously with modern development.

4.3. Urban memory conservation strategies from the perspective of typology

From the perspective of typology, urban memory can be achieved by identifying and preserving the unique historical forms of the city, including the preservation of representative architectural forms and block textures. Emphasizing the integration of traditional elements with modern design, encouraging the renewal of existing structures to ensure historical coherence and cultural continuity, to enhance urban identity and sustainability.

5. Practical application of urban memory typology
5.1. Construction of urban design tools based on typology

The design tool of urban memory typology builds on the basis of the typology theory, and forms a set of systematic design methods by identifying and analyzing the deep historical elements of the city. At its core lies the identification of representative buildings and urban spaces as carriers of memory that, by combining them with cultural heritage, harmoniously co-exist between historical textures and modern developments [11]. This design tool surveys and classifies the types of buildings in the city, identifying those elements that represent the city's memory and embedding them into new design schemes. The design tools include spatial layout, stylistic features, and material use to ensure a harmonious symbiosis between old and new elements. This design tool has been applied to urban renewal and development projects to preserve and show the unique memory of the city in improving the level of urban modernization [12]. Through the meticulous control of building height, form, and spatial relationships, the tool seeks to maintain the character of the city amid rapid development and to enhance the sense of belonging and identity of the residents.

5.2. Application cases of urban memory typology in urban planning and design

The protection planning of Qingdao old city reflects the concrete application of urban memory typology in urban planning and design. In this case, the plan emphasizes the connection between the existing buildings and the historical context, re-examines the historical district of Qingdao, and explores the typological characteristics of its core landmarks and characteristic buildings through a typological perspective. This approach involves a detailed analysis of the existing building, determining its role in the city's memory, and, based on this, developing a renewal plan. In the planning process, the balance between conservation and development is emphasized to maintain the urban form and historical continuity. Finally, through typological tools, the planning ensures the continuation of the value of historic buildings and cultural landscapes, and enables residents to enhance their sense of identity with the city, thus achieving effective protection of urban memory.

5.3. Analysis of the impact on urban memory protection

As an innovative design tool, urban memory typology has had a profound impact on urban memory protection. By introducing typology theory into urban planning, it is possible to identify and preserve urban Spaces and building types of historical and cultural value. This approach not only helps maintain the continuity of urban form but also enhances residents' sense of identity with the city. According to the case of protection planning of Qingdao old city, the application of typology theory can effectively protect urban memory and maintain the uniqueness and ancient charm of the city. Urban memory typology emphasizes the value of cultural heritage, promotes the balance between development and protection, promotes the comprehensive consideration of urban planning from the material to the spiritual level, and provides a profound and meaningful path of cultural inheritance for modern urban design [13].

6. Summary
6.1. Research conclusions

Research shows that urban memory is a core component of a city's cultural and social fabric, and its preservation is essential for urban identity and sustainable development. With the help of typology theory, it provides a new perspective and method to identify and preserve urban memory. Typology becomes an effective urban design tool by revealing the inherent connections between existing buildings and urban spaces. This study verifies the effectiveness of urban memory typology through the case analysis of Qingdao old city conservation planning, and realizes the stability and enhancement of urban form and local identity. As a design tool, typology can introduce historical elements into urban renewal, ensuring the continuous protection of cultural heritage and thus maintaining the uniqueness of the city. This approach aims to preserve not only the physical form of the city, but also its underlying cultural and historical values. This theoretical and practical innovation provides new guidance for current urban planning and design, and puts forward effective strategies for promoting urban development with social, cultural, and environmental sustainability. This study provides important theoretical basis and methodology support for future urban planning practice [14, 15].

6.2. Inspiration for urban planning and design practice

Urban memory typology is of great significance in urban planning and design practice. Integrating typology theory can provide a structured approach to urban design, emphasizing the compatibility of historical context with modern needs. By identifying and protecting the memory carriers in the city, urban planning is no longer

only concerned with spatial layout, but is more concerned with the continuation of culture and emotion. Practice has proved that the typology method can keep the form stable and avoid the homogeneity tendency in urban renewal. The core of its humanistic care emphasizes the local identity of residents and improves the quality of life. Typology also encourages designers to reflect and innovate, and to come up with sustainable solutions based on respect for history. This comprehensive approach provides a solid theoretical basis for creating a unique urban environment [16].

7. Conclusion

By introducing the theoretical framework of typology, this study discusses the importance of urban memory and its relationship with urban design, especially how to use typology as a design tool to protect and strengthen urban memory. The results confirm that the typology of urban memory not only helps to maintain the cultural characteristics and historical continuity of the city, but also enhances the residents' sense of belonging and identity to the city. However, the practical application of urban memory typology also faces some limitations, such as the lack of historical data, conflicts among stakeholders, and existing regulatory and policy frameworks that may hinder the implementation of new approaches. Therefore, future research is needed to find more effective strategies to overcome these barriers and further optimize typology tools to ensure their wider and more effective application in urban planning and design. In addition, interdisciplinary collaboration and deep multi-stakeholder involvement will be key to further promoting the urban memory typology approach. This study not only provides a new perspective and tool for the protection of urban memory, but also provides theoretical and methodological support for the sustainable development of urban planning and design in the future. It is hoped that this study will inspire more scholars and urban planners to pay attention to urban memory conservation and promote more innovative empirical research and practical exploration.

Disclosure statement

The author declares no conflict of interest.

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