

Typology Methodology on the Research of an Urban Renovation Project

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I INTRODUCTION

Under the pressure of the modern natural science paradigm, the architectural profession faces many doubts from within and outside the discipline. Some people doubt the interaction between research and design, or theory and practice, and even deny the value of architectural research; on the other hand, from Vitruvius (1st century BC) to nowadays, many architects and architectural heurists claimed that architecture is one of the earliest and the first discipline as both art and science, as well as the ultimate goal of all creative activities.¹ Through research methodology, our position of thinking about problems can transit from positive to active. Many heuristic techniques appear in the process of critical thinking and inspire the design process. For architectural design practices, research often starts from experience and helps us to obtain sensible and qualitative samples. At the same time, architectural research and design interact with each other. Enhancing the awareness of research is conducive to the development of architecture. Therefore, the improvement of research methodology also means the improvement of the design process as well as the architectural project.

Through this course Lecture Series Research Methods, I began to think about the research methods of architecture. Roughly speaking, this is related to the subject characteristics of architecture itself, so there is no simplistic answer. Which interested me most is the characteristics of the architecture study from the perspective of research methods and demonstrating the rationality of the discipline under the premise of extensive compatibility. In other words, architecture can be science that has the most rationality and creativity, as the same time its specific methods and approaches are different from other disciplines; moreover, this difference is between the research object and the research purpose in different context. Once they are placed in the overall identity of the human science world, this difference would be very small and intriguing.

As I am a student of Architectural Engineering, I want to explore the possibilities of technology and engineering as an answer to architectural questions. In my graduation project, I chose to make a renovation in Amstel III, which is a monofunctional office zone in the south-east of Amsterdam. There are two main problems in this area: the monofunctional metropolitan and the uncircular construction. As this office zone is developed as a new district in a certain period of last century (the 1970s to 1990s), many buildings in this zone represent a certain type of offices in the Amstel III area. Still, the urban environment is integrated and complicated, so I need to understand the context by typological method along with other methodologies. After the first phase of qualitative research, typological research also helped my decisions in the after phase of scientific calculation and prototype development. I hope this paper could reflect myself on what is the role of typology in my research of renovating buildings in a monofunctional zone by circular technology.

¹ Krufft, H. W., et al. (1994). *History of Architectural Theory*, Princeton Architectural Press.

II DISCUSSION ON TYPOLOGICAL METHODOLOGY IN RESEARCH

In general, my preliminary research starts with qualitative research approaches of reading policy documents, mapping the site, interview and study trip of related urban areas. When studying this office area, the main motivation for my choice of typological methodology is that the functional attributes of office buildings are the hallmarks of Amstel III area in the previews planning of the municipality, and they are also nodes and miniatures of this area. Therefore, my research on them should not be limited to the discussion of their spatial forms but should have more consideration of their urban influence. The new renovating intervention should be consistent with the culture of the region and the image of the city. How to maintain the city's own traditional features without being eroded, and after adding other programs according to the new mixed-use ambition, can the building and urban environment in Amstel III still build a bond between the residents? Through the analysis of different types of office buildings during the development of the region, and research on urban and policy of similar areas, I have gained useful samples of the economic, social and cultural aspects of buildings in Amstel III as typological context.

In my later technical research, more specifically, studying the assessment criteria for detachable connection types in enclosure structures, the typology approaches are also very helpful. Although typology in traditional architecture pays more attention to the laws and developments of architectural ontology and cities, it studies a group of objects with similar forms, structures or characteristics. In this situation, history and culture is not the main message conveyed to me by the types, the main difference between the types are the structural and functional needs. I have summarized the basic nine types of demountable connections from the selected cases: stacking, interlocking, magnetic, bolts, etc. They all have detachable features, but they are different in many other characteristics. So, I combined the assessment of materials in the typological methodology. By testing types and comparing factors such as detachability, environmental impact, tightness, and aesthetic potential, I had deeper understandings of why a certain type appears in the case project, and which type of connection to choose for my own design and research.

On literature review, the previous study on methods and techniques in architectural research had indicated that typological methodologies play a significant role in contemporary designing methods as one of the numerous domains based on verified scientific knowledge, in the situation that design is facing more and more refined practical criteria, such as technical and environmental requirements.² Besides the common three historical phases of typology in contemporary architecture theory, with the development of digital design and production techniques such as parametric design and 3D printing, typological methodology absorbs a new meaning of parametric control of formal types.³

² Niezabitowska, E. D. (2018). *Research Methods and Techniques in Architecture*, Routledge.

³ Carl, P. (2011). *Type, field, culture, praxis*. *Architectural Design*, 81(1), 38–45

III METHODOLOGY HISTORY REVIEW AND REFLECTION

The topic of type has a long history since begun, and if trace it back to the methodology, it has already been applied in Vitruvius's Ten Books on Architecture when it comes to discussion of columns and temples. In the discourse of column types in ancient temples, he also used the methodology of analogy to draw some universal rules.⁴ Here, the methodology is more likely to appear as a means of obtaining inspiration and has nothing in common with one view today (architecture should be "like" something in looking which makes sense).

In contemporary architecture theory, the earliest found typological approach is from the French archeologist Quatremère de Quincy who wrote *Encyclopédie Méthodique* in the Enlightenment. In the discourse of architecture during the twentieth century. Though during the development of modernist architecture, the concept of type lost part of significance, it still gained mainly three recognizable phases according to Peter: besides the first phase of Quatremère's tent, cave and hut, which codified in JNL Durand's design procedures.⁵ The second phase is during the early Modernist Functionalism, architects start to regard both poetics and efficiency for housing, Le Corbusier is one of the represents. His Domino system prototyped the framework with the manifesto's attitude; For Corbusier, the secret of architecture also lies in geometry and proportion. As early as in the book *Towards New Architecture*, he has already involved typology and order. In his view, man created types through geometry and brought his work into harmony with the order of the universe.⁶

According to Anthony Vidler⁷, typology can be subdivided into three currents. The first advocates the imitation of the basic laws of nature; the second one equates architecture with the industrial production, and The School of Venice represented by Rossi and Manfredo Tafuri is classified as the third type of typology theory.

In the first two categories, they both have solidified or figurative or abstract prototypes whether based on natural or industrial backgrounds, while the third kind of typology is different, its prototype can be translated from seemingly unrelated things. For example, Peter Eisenman's series of interpretations based on Casa del Fascio of Giuseppe Terragni. This process is like a moment of genetic mutation, unstoppable but full of imagination. This methodology is still subtly affecting the architects of the younger generation, for example, Toyo Ito and Rem Koolhaas.

Cause I am facing adding new programs into a monofunctional metropolitan, how to integrate new forms into the original context becomes my early biggest challenge. Back to the history, Form was placed in a prominent position in the study of typology as a carrier of collective memory. However, after Adolf Loos' essay about ornament being a crime in 1908, functionalism became popular, and the forms presented an increasingly monotonous decline in the name of industrial aesthetics. In order to solve the crisis of modernism caused by this, the American and European architects have tried in different directions. The New York architects represented by Robert Venturi, advocates "learning from Las Vegas" to save the aesthetic fatigue caused by minimalism through visual diversity; while European scholars centered on Venice chose a more thorough way of reflection, setting sights on a deeper history, looking for architectural prototypes that were hidden but have influenced architecture till now. For this reason, though my technical solution is to find universal typologies of mixed-use buildings, I still insist to learn from the contextual typologies according to the experience of history.

⁴ Pollio, V. (2017). *Vitruvius, the Ten Books on Architecture*, CHIZINE PUBLN.

⁵ JNL Durand, *Précis des leçons d'architecture données à l'École polytechnique*, Paris, 1802–5.

⁶ Corbusier, L., et al. (2007). *Toward an Architecture*, Getty Research Institute.

⁷ Anthony Vidler. (1977). *The Third Typology*, Cambridge: MIT Press.

In my renovation design of Amstel III area, the metaphorical typologies played an important role in my research process this semester. The aim is to make an initial description of the structure of the project, including the cultural, symbolic and experiential context. The typological design learning framework by Robert⁸ summarized the hierarchy of typological interpretation in the design process, which inspired my application of typological methodologies. They extracted three typologies from numerous types of information: Metaphorical, systemic and elemental. The metaphors offered the large overall framework with basic examples while the elemental typology focuses on employing multiple types with less definition of the project. Therefore, multiple ways including mapping, interview, literature study, and field measuring were implemented to develop my further design steps.

IV POSITIONING AND CONCLUSION

My personal research is based on the whole framework of Architectural Engineering Studio, in this studio, the purpose of research is to reinforce the design by facts and argument but not to make a summary of design. It also requires simplicity which requires us to discourse the main research in a paper of eight pages. Cause I am in a cooperative studio with 3XN architects, we wrote a booklet together call Upcycle Amstel in the first three quarters in this semester as the context research. This booklet contains the context about the circular renovation from Europe to Amstel III, as well as some practical tools that extracted from typical cases.

The Types and Typology lecture by Robert Alexander Gorny taught me the definitions in typology. By introducing etymology and historical development, Gorny showed the generativity of types to me. He compared the concepts of morphology, taxonomy, and topology, which delineated the specific meaning of typology in architecture. He also mentioned a modern idea of type and typology, which is reclaiming a generative notion of type. Learning from his arguments, I believe that a typological method is a tool that is both logical and concrete and can flexibly describe architectural concepts.

The lecture on Material Culture by Eireen Schreurs helped to shape my position of research and design. Architecture is a culture of making which represents itself. The lecturer pointed out the close relationship between an understanding of culture and society and the study of material properties. It made me realized that the concept of the type also played a significant role in converting richness into complexity in architecture⁹. I also agree that to be qualified as architecture, everything needed for this purpose should be realized in form, or in other words, materials with their properties like usage, size, and position.¹⁰

This position is very important to my research because that the main objects I am facing in the studio are not only buildings but also metabolic materials in an urban environment. So, I developed my material and component typological methodology based on the elemental typology level including information of material parts, conditions, moments and functions. In the analysis of certain case buildings in Amstel III, I collected the sizes and material content of typical building component like window frames. By analysis the typologies both quantitatively and qualitatively, it became clearer about which part of the original building I should keep for the renovation. Beyond this, a type of component or material also represents the technological development and cultural cognition in a certain historical period in Amstel III. This is also proved by Ka rrholm's historical typological view: Building types "play active parts in societal

⁸ Grover, R., et al. (2018). *The typological learning framework: the application of structured precedent design knowledge in the architectural design studio*. International Journal of Technology and Design Education 28(4): 1019-1038.

⁹ According to the neurophysiologist Colin Blakemore (interview on Radio 4, 1992): 'Complexity is like the molecular structure of the Himalayas, richness is like the human brain or language.'

¹⁰ Carl, P. (2011). *Type, field, culture, praxis*. Architectural Design, 81(1), 38-45

change and in the ongoing power relations in the urban landscape”¹¹. They also impact from our daily behaviors to the whole urban development.

The works of 3XN/GXN architects when we were invited to have a study trip in Copenhagen also inspired in research and design methodology. Their circle house is an exhibition of different building component typologies in an integrated pavilion. Many of their circular projects are a great example to show the power of typological methodologies in different ways. They see building typology as both the start of the design and the part of the result. They use original building typology to verify building concepts and circular indicators. After design, they also have a welcoming gesture for other researchers to use their building and product typologies, which is helpful for the development of a global typological methodology.

For my individual architectural position, typological methodology plays a significant role in my research with design, both in the discourse of Amstel III context which results in a useful booklet and materializes the component detail of my later renovation design. I want to refer to Durand’s view that form is the product of material properties. Then materials impact from our daily behaviors to the whole urban development. As architects, we ought not to worry about designing differently from other buildings on purpose. More fundamentally, by comparing significant differences in typologies of use, history, function, and material, the results including form will be suitable but unique after proper design.

¹¹ Kärholm, M. (2013). *Building type production and everyday life: Rethinking building types through actor-network theory and object-oriented philosophy*. *Environment and Planning D: Society and Space*, 31(6), 1109–1124.

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