

# LSRM FINAL ASSIGNMENT

## Self-Assessment on Research Methods

### Synergetic Interrelation

Armin Fuchs  
4748816

#### I INTRODUCTION

The architect's perspective is unique in its versatility. Within his work he gets in touch with a continuously increasing number of disciplines. New impulses often emerge from other, more specialized working fields. Different scientific or professional backgrounds result in different approaches, outcomes and research methods. Nobody would ever question the different methodological approaches of mathematics and journalism, backgrounds that are wide apart but had a considerable influence on the Pritzker Architecture Prize winners of 2000 and 2004. For an architect it is important to be aware that different methods are based on completely different world views and subsequently produce different outcomes. Therefore, your own aims and priorities should be reflected in a clear definition of methods. Otherwise there is a high risk of having a wrong focus and therefore missing important data and parameters for a successful design.

The choice of a method starts with a position and should not only be done by intuition. The knowledge about research methods helps to widen your horizon willingly into the right direction and increases its relevance in the desired field. During the research methods course, I got triggered by the discussion about typology. The architectural discourse around Quatremère de Quincy that developed along with evolutionary theories and especially the discipline of morphology enabled me to have a new view on my project. Looking at sequences of buildings, identifying types and distinguishing it from models became one part of a method triad that I use in my research.\*

I graduate in Architectural Engineering and within the Shared Heritage Lab, an interdisciplinary design studio in the context of Bandung, Indonesia. Students from Architectural Engineering, Heritage, Landscape and Urbanism do their one-month field research trip together while approaching problems on a completely different scale. This consequently leads to fertile discussions because different research methods produce different views and emphases on problems.

The architectural engineer, as promoted by the studio, is environmentally sensitive and driven by innovative thinking. According to Asselbergs, "It merges building technology research with architectural education"<sup>1</sup>. Circular thinking is understood as the ability of closing energy and material cycles and the architect's most valuable contribution towards a sustainable environment. For me, this is an absolutely essential aspect of architecture because it actively deals with the world's biggest man-made challenge, climate change. However, the focus of my thesis topic is broader than this. With my thesis question "*How can a Mosque become the catalyst to implement a decentralized water supply system in the informal urban settlements of Tamansari, Bandung?*", I aim to close more than waste and energy cycles and I use methods that go beyond the horizon of building technology research.

## II RESEARCH-METHODOLOGICAL DISCUSSION

To define my research approach I would like to introduce the term of *Synergetic Interrelation*. It can be understood as architectural design that works as a catalyst to connect technical, social, cultural and political aspects, creating multifaceted synergies. With my approach I aim to provoke a highly synergetic kind of design solution. My thesis question touches upon different areas within architecture that are defined as three potentials. Exploring each potential requires a different research method with design as a synthesis.

*Metabolic Potential:* To develop a concept of a decentralized water supply system, I need reliable technical data. Hard facts about the flows of water, sewage, money, energy etc. are absolutely necessary as well as an understanding of how they are interact. The research approach is focused on understanding and quantifying metabolic systems. The building, the neighborhood and the city are being analyzed regarding inputs and outputs of energy and water and nutrients. It is often referred to as Material Flow Analysis (MFA)<sup>2</sup>. According to Lucas, it would be defined as quantitative research, aiming for objectivity and being quite far away from research practices that deal with architectural humanities.<sup>3</sup>

The expertise of system researchers within our discipline often lies in Urbanism and Landscape Architecture. The city is treated as an ecosystem. Smaller systems within the urban ecosystem cannot be looked at separately but as integrated open systems. However, since the scale of my design is going to be much smaller, their methods of data collection are too broad and labor intensive. Water systems specifically have to be looked at from a cultural perspective, as it is done in "Improving sustainability by technology assessment and systems analysis: the case of IWRM (Integrated Water Resource Management) Indonesia"<sup>4</sup>. They state that "sanitation systems in particular can be regarded as socio-technical systems, their permanent operability is closely related to cultural or religious preferences which influence acceptability"<sup>5</sup> Even though they do not aim for any architectural output, their methods of life-cycle assessment (LCA) and life-cycle costing (LCC) are very useful. Their research looks at small scale systems and has therefore a similar perspective.

*Collective Potential:* To implement the improved water system, non-technical aspects become more important. Habits, social behavior and relations, neighborhood structures, educational processes and other internal dynamics have to be researched in a different way. Most systems fail because of *soft factors* and not because of a technical error. A methodological approach with a sociocultural focus is needed that is able use the collective potential for the design process. Tom Avermaete has done research on how the public can shape the architectural approach and produce buildings that are suited to the specific local context.

Ooze, an Architecture and Urbanism office has many aims that match with my project. Their main approach is system based, with a special focus on water while their methodological approach is very context related. They aim to close resource cycles while acting on different scales, from households and small urban interventions up to urban designs. The emphasis on underlying systems and flows is expressed in their work, they try to make them visible and enjoyable. Their method includes several steps and is multilayered. Despite from collecting technical data, they spend much time at the site and do interviews with locals that are processed in movies and maps. The direct contact to local specialists such as botanists is crucial. The implementation of projects is stepwise and becomes part of the method: urban prototypes are implemented as part of a higher strategy. The system and the public reaction can be tested, improvements can be made and big scale realizations are more likely to follow afterwards.

*Typological Potential:* First drawn conclusions made me consider the potential of Mosques as the architectural catalyst that I was looking for. However, it created the need for another kind of research. When visiting mosques in the informal urban settlements, I discovered that typological thinking would bring me further: Mosques are often built on basis of a stereotype or model. That bears both, risks and chances for sustainable buildings<sup>6</sup>: on the one hand, if repeated irrationally from one place to another

even within an identical climatic region gives rise to some grave problems which can compromise multiple dimensions of sustainability<sup>7</sup>. On the other hand, this shows the potential for the wide-spread impact of an improved and more sustainable mosque prototype. For me, that's the most important reason why typological research adds relevance to the design.

### III RESEARCH-METHODOLOGICAL REFLECTION

*Metabolic Potential:* Preindustrial circular systems disappeared with the ongoing globalization in the western world and had to be reinvented and adapted to the new society. Disastrous living conditions in metropolises such as London and Berlin in the late 19<sup>th</sup> Century were drivers to come up with systems to improve the ecological aspects of cities and therefore the physical and mental health of the people. Ebenezer Howard's concept of the Garden City<sup>8</sup> met the current zeitgeist and started the Garden City Movement. Different versions of a self-sustaining city including agriculture, and waste treatment were realized. These systems could work at a city level like intended in the Garden City Letchworth close to London or at household and community level like in the Garden City Falkenberg, Berlin<sup>9</sup>.

Both, English and German reformers acted on basis of Howard's theoretical concept. However, the practical implementation was always seen as an experimental basis for the further development of the Garden City idea.

*Collective Potential:* Bad living conditions in the urban centers in the late 19<sup>th</sup> century did not only trigger new approaches of circular thinking. They also provoked progress in public participation and architecture. Building cooperatives within the German reform movement empowered the people to shape their living environment according to their own ideals of a more healthy city. Architects working together with these cooperatives had to adapt to a new type of client that was often driven by strong reformist ideals. The Garden City Falkenberg serves as an example how the architect (Bruno Taut) and members of the building cooperative explored ways of participatory methods that resulted in a place with strong identity and mutual trust of the inhabitants. These values got lost within the almost enforced conformity of modernist post war architecture. Examples such as Gropiusstadt in Berlin or the Bijlmermeer quarter next to Amsterdam proved that there was no overall formula for housing and that architecture should be more about the people than the dictate of economy and industry. In "*The Architect and the Public: Empowering People in Postwar Architecture Culture*" Avermaete analyses the consequences for the role of the architect, who no longer is "an exclusive artistic genius serving a private client but rather an inclusive engaged architect playing a public role"<sup>10</sup>. "As a facilitator for public participation, all barriers between builders and users must be abolished"<sup>11</sup>, which requires a new set of methods and tools. Peter Rice and Renzo Piano's mobile workshop serves as an example for this participatory method that enables the dialogue of residents and architects.

*Typological Potential:* The emergence of typological studies is closely related to Antoine-Chrysostome Quatremère de Quincy (1755-1849), architectural theorist and secretary of the *Académie des Beaux-Arts* in Paris. The analytical approach of looking at sequences of related items to draw conclusions about a set of underlying principles did not only occur in architecture: morphological studies investigated on the origin and development of species while Quatremère was looking for the origin of architecture<sup>12</sup>. He defined these principles as types, that present "less the image of a thing to copy or imitate completely than the idea of an element which ought itself as a rule for the model"<sup>13</sup>.

Quatremère's distinction of type and model was rooted in platonic ideas and has been an important reference point for later approaches.

In postmodern times, typological and morphological studies of the housing as well as urban plans were used as a tool to counter the late modernist movement. They emerged from the rising interest of architects such as Rossi in the grown city and their underlying principles. The CIAM and Le Corbusier's Ville Radieuse were blamed to provide models, that were applied regardless to any context, destroying inner cities and creating desolate suburbs<sup>14</sup>.

#### IV POSITIONING

To position myself as an architect *Synergetic Interrelation* plays an important role again because it describes the potential of architecture as I see it. Separate research methods about the metabolic, public and typological potential of the place are required to get an optimal data output. Conclusions are drawn in between these research themes.

It is a common argument that the architect's position is redundant due to his lack of specific knowledge and one could argue that choosing several research methods reduces the total depth of the research. In fact, this position paper with its limited length could be seen as an analogy to this problem: if I had only chosen one method, I could have elaborated it much more. However, every research theme reveals its own restrictions while the central position of the architect allows him to overcome them creatively by integrating other disciplinary fields. Closing circles sometimes requires transdisciplinary thinking. Restrictions on one thematic field are seen as chances on another. The water engineers perspective does not cover the aesthetic and recreational potential of a filtering container. The local inhabitant doesn't see the possible correlation of sewage in his pipe and money on his account. The Imam has no clue that his mosque could significantly reduce fire hazard in the area. The building becomes the central relay station of several integrated circuits, the catalyst for social, cultural and technical potentials. The active search for synergies within the design is a method itself but requires different pools of knowledge that have to be investigated separately.

As part of this process I find Tom Avermaete's research on the participatory potential of the public very inspiring and the methods that he proposes convincing. What he defines as commons are the unique resources of a place that can be physical, cultural or intellectual<sup>15</sup>. Within the research process, the commons can be identified. Within the design process they become unlocked by using the tools of collective work. The outcome is a design that strengthens the communal identity of the place.

It is this synergy of using existing public structures while contributing to its empowerment where I draw parallels to my own research. Like Avermaete I see the potential of resources in various fields and public structures as the key to unlock them.

The work of Ooze has been the most relevant for my research because of three reasons: first, their focus on water systems and social structures enables them to close circles through different disciplines. They see both: metabolic and collective potential and chose their research methods according to it. Second, they work on different scales from one small household system to combined systems on city scale. Third, the use of design prototypes is efficient and something that I want to elaborate within my typological research. The technical system can be tested and improved. But more importantly, the new type can be adapted, copied and combined without the involvement of the architect. I do not agree with John turners plea for an architecture without architects<sup>16</sup>. But we have to face the fact that the fast growing informal areas around the world would never be able to hire an architect, nor are governments able to meet the need for housing of their growing cities. To have an impact, buildings have to be types that reproduce themselves like a plant species that conquers a new ecological niche. A "fertile" design requires all aspects that I try to cover within my research, defined by the interplay of local potentials as the backbone of the building. In that sense, the architect is less creator but arranger of a systems flows in the most efficient way.

- 
- 1 Thijs Asselbergs, *The New Architect: Integrating Innovation into Architectural Assignments; In Search of a New Role* (Delft: TU Delft Open, 2017), p. 300
  - 2 Agnès Montangero, 'Material Flow Analysis for Environmental Sanitation Planning in Developing Countries: An Approach to Assess Material Flows with Limited Data Availability.' (Fac. of Civil Eng., Leopold-FranzensUniversity Innsbruck, 2006).
  - 3 Ray Lucas, *Research Methods for Architecture* (London: Laurence King Publishing Ltd, 2016), p. 37
  - 4 S.Nayono and others, *Improving sustainability by technology assessment and systems analysis: the case of IWRM Indonesia, Applied Water Science* (2016), 279-92
  - 5 S.Nayono and others, *Improving sustainability by technology assessment and systems analysis: the case of IWRM Indonesia, Applied Water Science* (2016), p. 2
  - 6 Ergün. Erkoçu, Cihan. Buğdaci, and David politiek McKay recht, vertaler., *The Mosque : Political, Architectural and Social Transformations* (Rotterdam: Nai Publishers, 2009), p. 2
  - 7 Tayyab Ahmad and others, 'Implications of Stereotype Mosque Architecture on Sustainability', *Procedia Engineering*, 145 (2016), 96–103, p. 3
  - 8 Ebenezer. Howard, *Garden Cities of To-Morrow.*, 2nd ed. (Charleston : BiblioBazaar, 2008)
  - 9 Christian Böttger, *Zum Leben in Den Genossenschaftlichen Siedlungen 'Eden' Und 'Falkenberg' Vom Beginn Ihres Bestehens Bis 1933, Eine Vergleichende Volkskundliche Untersuchung Der Lebensweise Und Kultur von Bewohnern Zweier Siedlungen Im Berliner Raum*, 1993.
  - 10 Tom Avermaete, *The Architect and the Public: Empowering People in Postwar Architecture Culture*, p. 61
  - 11 Tom Avermaete, *The Architect and the Public: Empowering People in Postwar Architecture Culture*, p. 59
  - 12 Jonathan Noble, 'The Architectural Typology Of Antoine Chrysostome Quatremere De Quincy (1755-1849)', University of Tlie Witwatersrand Johannesburg, 1997, p. 147
  - 13 Jonathan Noble, 'The Architectural Typology Of Antoine Chrysostome Quatremere De Quincy (1755-1849)', University of Tlie Witwatersrand Johannesburg, 1997, p. 155
  - 14 Henk Engel, *Rationalist Perspective* (TU Delft Open), p. 183.
  - 15 Tom Avermaete, *Delft Lectures on Architectura Design Edition 2015/2016* (TU Delft Open, 2017).
  - 16 John Turner, *The Squatter Settlement: An Architecture That Works*, 1968.