

A world of numbers

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I INTRODUCTION

We are now living in a consumer world, a world where consumerism manipulates our behavior, where we focus on consumer goods and gadgets to change our lifestyles. This radical shift in our society has changed the way we look at spaces. As a creator of space, architects must find their role within this new society in order to react or create spaces that fit within this new world. What type of position you take as an architect can have a significant impact on how the people will foresee and experience the future. Data must fuel this notion of responsibility and creativity in order to create our future world.

Aldo Rossi explains in the architecture of the city that “The transformation of particular parts of the city over time is very closely linked to the objective phenomenon of the decay of certain zones.”¹ This is the reason why research within architecture is needed. Architects created spaces based on our knowledge and comprehension of the world. Thus, architects create space for the unknown, therefore we must explore these uncharted territories in order to understand and comprehend the types of data and information there is, in order to create a better future. In a world where the role of the architect has become more ambiguous, architects must rely on research in order to meet the digital demands of the future.

The series of lectures has broadened my eyes within the architecture research field. Realising that there's no tailor-made research method for a particular design objective but that it is more of a journey and experiences on how to relate different methodologies and design practices within your own body of work. Thus, choosing a type of methodology is more or less based on what you as a researcher/ architect wants to create or learn from that given objective or design hurdle.

With a world based on consumerism, we as architects must cater to the desires of others and therefore need to understand what the consumer wants. The methods to this perception are where research comes in to play in order to reach the core of the desires of that given context or object. Within the architectural engineering studio, we must pursue our own fascinations and interventions within the architecture field. Giving us the freedom to explore different topics without attaching it to any given context (you can choose from a range of preset location). I decided to choose Marineterrein as my location with fascinations in future renewable energy, asking the question: How can renewable energy be produced in our future city and how would it change our public perception of power plants?

This created the problem that I had to search for a reason why Marineterrein would fit within my architectural fascination making the objective much more difficult. Thus, in order to construct an architecture intervention regarding future renewables within cities, there must be a research method to find what the true notion of the location is and how this could be correlated to my architecture intervention.

¹ Bldf Max Vogt, Aldo Rossi: The Architecture of the City (New York: Society of Architectural Historians, 1983).96

II RESEARCH-METHODOLOGICAL DISCUSSION

With a fascination already in mind, I wanted to embrace and experience the context for myself, as each designer sees a context in their own way. Therefore, I wanted to understand what Marineterrein would become with my fascinations in mind. Viollet Le-Duc wrote in his architectural theory book that “Architecture, this human creation, is, in fact only an application of principles born outside us and which we appropriate to ourselves by observation”². Implicating that architecture is a human interaction based upon his/her reaction of that given situation. This type of Qualitative research had to relate with my own studio fascinations which were based on quantitative research regarding future technology and interventions. These were two separate subjects that had to be related to each other in order to produce one final balanced product. There wasn't a clear plan of attack for this research as I had to Improvise or adapt based on the findings of the given context or the findings about renewables technologies.

On that basis, I had to choose two approaches for my research, one that would give me the contextual knowledge and one that would give me hard technical data on different renewable interventions. This led me to the ethnography qualitative research method where it emphasises on in-depth engagement with site-specific settings, most especially through active and thorough observation³. Based on this method I could take a holistic exploratory approach while focusing mainly on observation⁴. This gave me the opportunity to imagine to explore the qualities of Marineterrein through interviews, site visit and other site focused case studies. At the other end of my research, I chose for a Simulation Research in Relation to Qualitative and/or Historical Research method in order to calculate and correlate my technical data to the more holistic approach of ethnography. These simulations are based on energy scenario programs in order to formulate different future energy scenarios for Marineterrein. This method was used to find the correlation between the needs of the Marine terrain and the researched technology.

Based on these methods I could accumulate different types of data in order to get to the core of the project on Marineterrein. However, by doing so it led to an extensive project as the framework would keep getting bigger and bigger as observations and simulations could go on endlessly. Therefore, a framework was created in order to maintain the growth of the research. Using ethnography to research one part of the study and simulation research to research the technical side of the research. This created a paradox where quantitative research battles the qualitative research qualities to find the true balance, where hard technology data meets the need of architecture and the consumer. The literatures and case studies did help to situate my position within the objective, starting from an ethnographic standpoint with an open mind but not with an empty head⁵. Ethnographic analysis is iterative⁶, thus helping and building your ideas throughout the research and design studies. Thus, helping me along the way using the simulation research as a pillar which would be supported by architecture qualities.

² Viollet-le-Duc, Eugène-Emmanuel, and M. F. Hearn. 1990. *The architectural theory of Viollet-le-Duc: readings and commentary*. Cambridge, Mass: MIT Press

³ Groat, Linda N., and David Wang. 2002. *Architectural research methods*. New York: J. Wiley.225

⁴ Groat, Linda N., and David Wang. 2002. *Architectural research methods*. New York: J. Wiley.226

⁵ Given, Lisa M. *The SAGE Encyclopedia of Qualitative Research Methods*. Los Angeles: SAGE Publications, 2008.288

⁶ Given, Lisa M. *The SAGE Encyclopedia of Qualitative Research Methods*. Los Angeles: SAGE Publications, 2008.291

III RESEARCH-METHODOLOGICAL REFLECTION

The core of my project rests on the simulation research scenarios of future renewables within our society. Thus, using qualitative research as a stepping stone to reach the desired prognostications and future scenarios. These types of explorations have become a must in our new society where sustainability has become a necessity.” The increasing interest in building performance as a design paradigm stems in large part from the emergence of sustainability as a defining socio-economic issue and from the recent developments in cultural theory and technology”⁷. This performance-based design is a new phenomenon as we progressed into an information age where computers and programs facilitate our hypothesis’ in various ways.

“Simulation research comes out of a broader human fascination with the replication of real-world objects and settings”⁸. Simulation research can be traced back to early western ideas whereas Aristotle was quoted saying “that art’s very nature is to represent how things could be, not how things actually are, and viewing enactments of these possibilities can be therapeutic. This is because we can experience emotions stirred by the representations without undergoing the dangers of the real things they represent”⁹. Thus, seeing art as a form of expression to frame our future possibilities and hypothesis’. These types of simulation could be seen through various artists and philosophers in order to predict or to imagine our future. Within architecture, we can see simulations being used in various ways in order to enhance the building’s experience. Simulations are used to test human factors, load-bearing systems, urban templates and many more architectural interventions¹⁰.

With that in mind Simulation research was the best form of research in order to figure out how future sustainable technologies could change our future cities power structure. Therefore, a scenario data calculator was created with excel, where raw data could be inserted in order to calculate what the consumption and production of each sustainable intervention would be. Based on different scenarios, an analyzation could be made on how future renewables would change our inner cities perspective of power production. The goal of the research was to search for the technical implications of sustainability and not the tangibility or the socio-economics of it. Therefore, a meta-analysis was made to compare and conclude different scenarios in order to conclude a future city power trend.

Technical diagrams were used as an instrument in order to understand technical interventions and scenario’s creating different energy flow diagrams. These diagrams gave a better perception of the researched data. The hard data was then looked at, through a phenomenological lens in order to understand the technical data’s tangibility within a city. “phenomenology is the interpretive study of human experience. The aim is to examine and clarify human situations, events, meanings, and experiences as they spontaneously occur in the course of daily life”¹¹. Therefore, to truly understand the effects of sustainable technologies within cities, existential phenomenological research is used a method to understand how these technologies would affect human interactions within cities.

‘At the beginning of the 21st century, a new kind of architecture is emerging, using building performance as a guiding design principle, and adopting a new list of performance-based priorities for the design of cities and buildings’¹². With Performative architecture’s emergence, architecture has shifted from pen and paper towards a computer age, where our imaginations and hypothesis’ can be tested in order to improve our buildings/cities performance.

With the basis of knowledge of performative architecture and existential phenomenological research method a future city trend could be concluded in order to understand how our future city could be influenced by sustainable technologies. Existential phenomenological research can be described as researching human experiences regarding that phenomenon gathering descriptive accounts from

⁷ Branko, Kolarevic. "Computing the Performative in Architecture." *Digital Design 21th ECAADe Conference Proceedings*, September 3, 2003, 454-64.

⁸ Groat, Linda N., and David Wang. 2002. *Architectural research methods*. New York: J. Wiley.349

⁹ Groat, Linda N., and David Wang. 2002. *Architectural research methods*. New York: J. Wiley.349

¹⁰ Groat, Linda N., and David Wang. 2002. *Architectural research methods*. New York: J. Wiley.350

¹¹ Seamon, David. 2000. "Phenomenology, Place, Environment, and Architecture: A Review of the Literature." *Kansas State University*. www.arch.ksu.edu/seamon/EAP.html.

¹² Branko, Kolarevic. "Computing the Performative in Architecture." *Digital Design 21th ECAADe Conference Proceedings*, September 3, 2003, 454-64.

respondents regarding their experience¹³. Therefore, simulation research was used as a foundation, creating different data scenarios that could be used for a meta-analysis. This data could be then correlated with existential phenomenological research, where people describe their experiences with different renewable technologies, understanding their perspective of sustainable technologies within living environments. These methodologies could help me prove my research hypothesis proving how renewable energy be produced in our future city and how would It change our public perception of power plants. In order to make a connection between the performance and the aesthetics, I decided to create different vision diagrams that were based on the different scenarios that were created. These diagrams can be seen as an artistic prediction impression that portraits that given simulation. Creating a systemic inquiry and qualitative research that uses data in order to produce a qualitative/ quantitative result¹⁴, giving enough knowledge for an architecture implementation.

IV POSITIONING

Being part of the group that researched territorial scales within architecture and architecture research, opened my eyes about research methods as it could be interpreted in many ways. Territorial scales could be seen as a system, which could be dissected and observed in many ways to truly understand its background and meaning. This way of interpretation correlates with what I did within my research by observing and analyzing through many scopes in order to truly understand the core of my intervention. As the core of Ethnography is to explore topics that are difficult to research and represent using quantitative techniques, and ask research questions that may not be readily accessed through language¹⁵. Thus, correlating with my intervention and the group session that I had, in order to find the background information about that given subject or context.

My findings and literature about the context were very biased, as every single person had a different opinion about that given location. The research was based on these observations in order to create a design framework that could facilitate my fascinations. Thus, creating a space for exploration within the research framework in order to find correlations between quantitate data and qualitative findings of the context. A position had to be taken in order to create a narrower framework, or you could be strayed away from the core of the research. In order to reach the goal, the renewable goal a decision was made to make the technical data to lead the research and make the performance of the building the primary goal.

This led me to a performative architecture where the performance of the building becomes one of the pillars of design¹⁶. As an engineer, I fixate myself with this typology as I don't see a building as a piece of art but as a mechanism that is part of a bigger story. Buildings should not only be pieces of art but should be producers of means that helps facilitate the needs of the world. The notion of designing something for your own amusement is something that I oppose within our field. Within a consumer's world, we as architects must base designs on hard data, in order to fulfill or facilitate the needs of the client. We must not design for other architects but must design for the purpose or performance that it's meant for. It is a vague line to balance, but we as architects must find this balance in order to create a better future.

"Buildings are now designed, documented, fabricated and assembled with the assistance of digital means. Within this new encompassing framework that he designates as digitally mediated design he argues that the emerging architecture of the digital era is characterized by high levels of complexity; this enables more sensitive and inflected response to the exigencies of contextual aspects such as site, program, and expressive intention than was generally possible within the framework of industrial modernism"¹⁷. Rivka describes that the digital age has created an opportunity for architects to elevate

¹³ Seamon, David. 2000. "Phenomenology, Place, Environment, and Architecture: A Review of the Literature." *Kansas State University*. www.arch.ksu.edu/seamon/EAP.html.

¹⁴ Given, Lisa M. *The SAGE Encyclopedia of Qualitative Research Methods*. Los Angeles: SAGE Publications, 2008.856

¹⁵ Delyser, Dydia, Steve Herbert, Stuart Aitken, Mike Crang, and Linda McDowell. 2010. *Qualitative geography*. California: SAGE.

¹⁶ Kolarevic, Branko, and Ali Malkawi. 2005. *Performative architecture beyond instrumentality*. New York: Spon Press.

¹⁷ Oxman, Rivka. 2006. "Theory and design in the first digital age." *Design Studies* 229-265

their design in many ways. By using research methods, we can facilitate our design with data that can create a better tomorrow, which was always the core of architecture. With the world becoming more technologically advanced, our building should meet these criteria's two, where performance and technology is one of the pillars of design and not something that is later added. Thus, coming back to what Aristotle stated in the beginning, using our expression to portray a better future.¹⁸

On that basis I can conclude that my research methods have led me to the answers that I was seeking, having a foundation of hard data that can be compared to the Marineterrein's goal and necessities. This led me to a better concept where the program is based on what is needed and not what I as an architect wanted or fixated with. Creating a design objective where an Architect needs to find the balance between the technical and aesthetics. A position where performance is not only the technical aspects but is showcased as a whole.

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¹⁸ Groat, Linda N., and David Wang. 2002. *Architectural research methods*. New York: J. Wiley.349

