EXPERIMENTATION WITH DUAL RESEARCH APPROACH.

Integration of research methodology within design process of the graduation project

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I   INTRODUCTION

Importance of the architectural research.

      Lucas Ray provides a very generic definition of architectural research as *".. process by which you understand the world in a verifiable and consistent manner."[1]* .Research is an essential tool of the architect that enables not only collection of specific information, but more importantly by use of consciously chosen research methods processing the data and finding accurate conclusions. I find is as the most important to be able to via conscious analytical process pose the questions that refer to actual problematics, not irrelevant ones. Moreover it has to be followed by an structuralized and logical research structure organized within a specific methodology. That results in a process that complements the architectural design quality and constitutes of a value for general architectural knowledge.

Personal findings and improvement of research methods.

      This ordered logic and overall consciousness of research approach choice is the crucial result of attendance in the lecture series and lecture of several scientific documents related to research methods. I have used research as an integrated design tool, I have experimented with various methods to enrich the reliability of design and its qualities, whereas beforehand it had never been an "designed" process, where I have not consciously used specific approach. Following the lectures I have created a conceptual framework of my graduation research in advance, basing on the scheme of Fransje Hooimeijer[2], as well as, diagram showing "The methodological practices of strategies and tactics within system of inquiry and schools of thoughts"[3]. Beforementioned diagram constitute of significant help during the beginning of the process for organization of it.
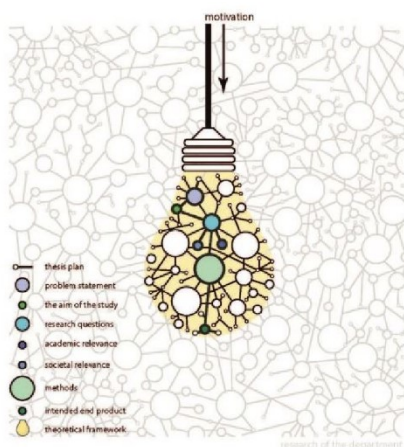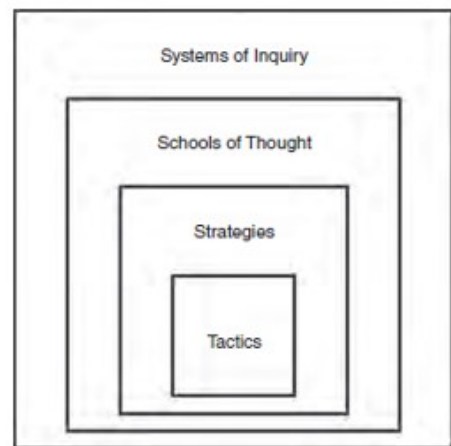

Figure 1.
Research process organization.[4]

Figure 2.
The methodological practices[5]

The result is an organized conduction of research presented on figure 3. In chapter II, instead of chaotic, not structuralized "methodology" that I have used to apply in the previous research processes.

END NOTES:
1   Lucas, Ray. Research Methods for Architecture. London: Laurence King Publishing, 2016.
2   Hooimeijer, Fransje. "Architecture Methodology", retrieved from https://prezi.com/5ukgddp8mp-q/architecture-methodology/, 2019
3   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013
4   Hooimeijer, Fransje. "Architecture Methodology", retrieved from https://prezi.com/5ukgddp8mp-q/architecture-methodology/, 2019
5   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013

Graduation studio approach.

My master graduation studio is Architectural Engineering, with main emphasis put on search for innovative technical, spatial solutions that serve for improvement of the build environment. My graduation project is located within the realm of "Valuable Neighbourhoods" and "One Million Homes" sub-studio groups, where graduation projects are aiming to reflect on contemporary residential architecture problems and envisioning the future of the living environments (with a general requirement to contextualize the project within Netherlands).

Graduation project & research introduction.

As Architectural Engineering Studio is allowing each of the students to formulate their own fascination and specific approach towards the general thematic I have conveyed preliminary data and literature research to specify evidence based problem statement for Dutch housing sector. Basing on the statistics, governmental reports and housing-related issues highlighted in the media I have formulated problem statement for my graduation project. It relates to the issues of housing unaffordability among starters and young families, omnipresent urban loneliness issue and negative environmental impact of housing construction.

To formulate the hypothesis and research questions I have conducted literature study related to affordable housing design, resilient residential developments, future-oriented housing schemes, housing organizational models. The study has showed an overall scope of directions, either existing and historical studies and future-oriented conceptual visions.

The result had been an aim of the project to respond to the stated problem via "Sustainable affordable Community" housing project. The theoretical framework studies led to the hypothesis that "private commissioning models possess the potential to innovate, as it lacks profit-oriented investor and the potential to build communities via communal living and sharing spaces, objects and so forth" It resulted in more in deepened elaboration on non-profit oriented housing organization models hand in hand with lecture about the sustainable innovation in residential architecture that reduces its environmental impact.

My research question has been a form of conclusion out of those investigations, with a challenge to find a notion that can bind together social, spatial and technological aspects of living environments. I have formulated question that refers to shared economy, envisioned as one of the key areas of development by EllenMacArthur Foundation think-tank towards future-proof design[7]. To conclude I have focused on elaboration on "What qualities, values can sharing on the scale of the neighbourhood provide in social, spatial and technical domains for living environment?"

END NOTES:
7   Ellen Macarthur Foundation. "Cities in the circular economy: an initial exploration.", Ellen Macarthur Foundation, 2017
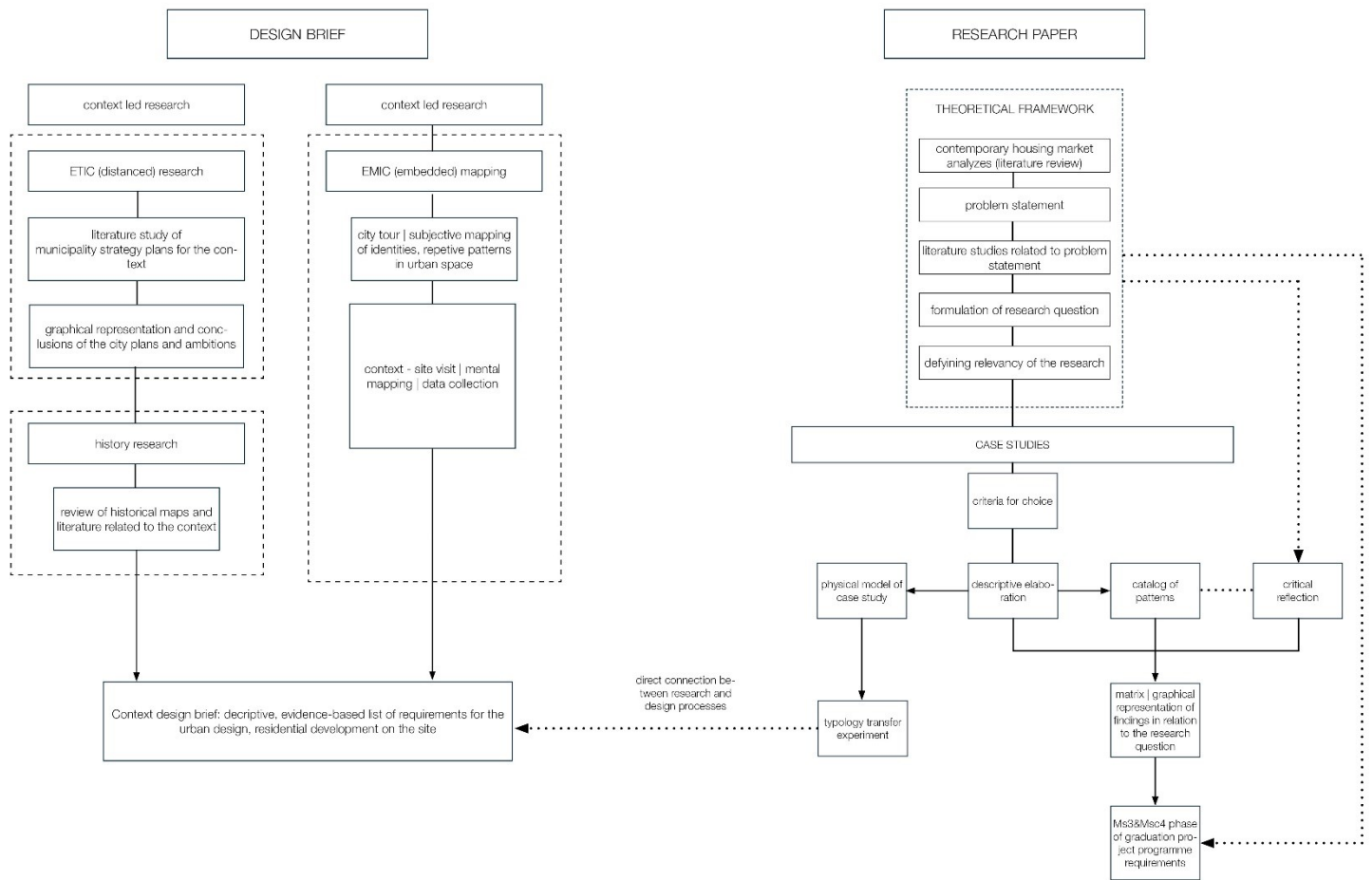
II   RESEARCH METHODOLOGY.

Fig.3 Research structure organization.

Research duality.

In the Architectural Engineering studio approach, it is expected that the project site would be chosen in the early stage. Therefore preliminary design phase starts simultaneously with the research path. I wanted to develop my research methodology as a form of constant support for the design part of the graduation project. I have formulated a system, with two researches. Firstly, the context-led research to elaborate on the chosen project location focused on gathering data relevant for direct design decisions. Second part, that constitute of the research paper is a context-led research (where context is defined by the case studies analyses) that aims to formulate an extensive answer for the beforementioned research question.

Location analyses.

I have decided to research the location in etic context-led research[9], approach, of objective urban mapping, collecting data about spatial relations and interconnections between the chosen plot and the surroundings. Moreover, a booklet summarizing the city strategy plan related for the design site area has been created. That enabled organization of data and critical reflection on them, as a distanced observator (in form of epistemic urban scale map drawings).

END NOTES:
9   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013

Although for architects, designers of spaces utilized by people, it is necessary to combine it with emic, embedded and more subjective anthropological methods. To add this layer of impressive and embedded in the context research, I have used approach referred to personal experiences from Borders&Territories studio. I have conveyed a "derive"[10] a city walk, that aims to stimulate the awareness of psycho-spatial surroundings. It provided reflection about intriguing characteristics of the city, mapped in form of photographies and sketches. Final result of this approach had been a collage map that represents the subjectively observed identity of the city, set of repetitive aesthetic, spatial correlations between objects that are especially characteristic for the context.

On the project site I have conveyed praxeological type of analyses via drawings. As in the embedded observatory approach, series of sketches with key notes about the use of spaces, spatial territories, borders, potentials and challenges were created.

Those two different approaches combined constitute of design directions brief, describing a set of requirements and goals for the site developments.

Research paper.

Research document related to the question of "What qualities, values can sharing on the scale of the neighbourhood provide in social, spatial and technical domains for living environment?" required reflection on the most appropriate methodology to look for response to that question. The aim of this research paper is critical reflection on existing case studies, that fulfil specific and formulated criteria of choice with knowledge from theoretical framework. An reflection on what qualities had been achieved via sharing, as well as, what could have been achieved according to the state-of-art literature about the domain.

As mentioned before, each of the case studies had been chosen basing on the criteria that increases relevancy of their context for the graduation project site, therefore location criteriu (analogical conditions to the graduation project site). Moreover different periods of realization had been applied, as well as, literature support evidence of presence of sustainable and sharing oriented ambitions of the projects.

Each of the case studies had been analyzed in linear-analytic research method[11] It combines descriptive and exploratory elements via introduction of crucial data, description of the project, answering research sub-questions of spatial, social and technological aspects related to shared economy present in the context. Those aspects are graphically represented in form of diagrams forming "catalogue of patterns (types)" [12] . Finally epistemic axonometric drawing showing the physical location of architectural elements that refer to those sharing aspects within the analyzed architectural project.

Final part of the research paper is organized graphically into a matrix showing the relevancy of each of those patterns for the research questions. Finally, we can critically assess the value and quality of these aspects.

III   RESEARCH-METHODOLOGICAL REFLECTION

Introduction to reflection.

The interrelation between design and research is formulated by application and experimentation with "Typology transfer" [13] method where specific context typology is theoretically placed in new context and being analyzed. I have built physical model of each of the case studies and via location on the design context I could have conveyed an observation of the scales and spatial relations between graduation project site and the case study project.

This experimentation together with the methodologies mentioned in the previous chapter results in an interdisciplinary approach, where social, architectural and technological aspects are combined by common notion to look for a holistic answer to the research question.

END NOTES:
10   Debord, Guy. Theory of the Derive. .Les Lèvres Nues #9, 1956
11   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013
12   Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. A Pattern Language : Towns, Buildings, Construction. New York: Oxford University Press, 1977
13   Christ, Emanuel and Gantenbein, Christoph, "Typology transfer – towards an urban architecture", ETH Zurich, 2011

That incorporates the reflection on statement that various research disciplines that are not directly correlated should be integrated with each other to bring innovation to the research on the appropriate level of relevancy for real improvement in the built environment.[14]

Research method – case study analyzes.

The analytical method in form of case study research is scientifically treated as a reliable research tool. In an extensive study of this method Robert Yin formulates a definition – " *A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident…*"[15] In it particularly supportive for the case of this graduation research paper, where presence of the phenomenon of specific approach towards living environment (shared economy principles) within multiple cases is being analyzed.

In the research paper analyzes and reflection on future of residential and urban developments is conducted, therefore it is important to refer to the impactful studies of Jane Jacobs, where clearly formulated strategies for her case study investigation, articulating a logic, that had been later elaborated in literature about case study research methods.

Those methods were later implemented by a study of Fernando Lara in Belo Horizonte [16] that investigated modernist housing. It was an early example of structuralized case study research with clear strategy and methodology: historiographical research in archives about social and spatial backgrounds of the projects, formal analyses of aesthetics, interviews with representative number of residents. This significant amount of reliable data resulted in very detailed explanation of the research question.

I have defined the need for multi-case study research method, basing on the research question. A bigger scope of the study projects provides potential of higher number of types, each of cases should represent residential architecture project with evidence based relation to the research question. Their number should be sufficient to create a base of types for final elaboration.[17]

I have reflected on how to apply the method with its main principles:[18]:
  a)   cases studies and their relation with real-life context,
  b)   explanation of correlations and links,
  c)   interrelation between case study and development of the supportive theories;
  d)   basing on multiple sources for evidence;
  e)   the potential of the method to generate theory.

Analyses of case studies that are embedded in the real-life context is not only a simple study of phenomenon in the surrounding. It has to be explanatory about the broader circumstances that has formed and led to the specific real-life condition.[19] Therefore I have integrated that to the case study research via descriptive study of the decision-making and organizational process behind the realization of the case project, answering the question "What led to the achievement of those specific qualities?". This enabled better understanding of the correlation of the processes, that could be further integrated in the graduation project programme.

The development of the theory, general knowledge about the phenomena is essential, when the purpose of the research is to elaborate on it within the context. Is essential to have sufficient supportive theoretical "grid" for the process, not necessarily an extensive theoretical study[20].

END NOTES:
14   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013.
15   Yin, Robert K. Case Study Research : Design and Methods. Fifth ed. Applied Social Research Methods Series, V. 5. Los Angeles: SAGE, 2014.
16   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013.
17   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013, p.431
18   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013,
19   Yin, Robert K. Case Study Research : Design and Methods. Fifth ed. Applied Social Research Methods Series, V. 5. Los Angeles: SAGE, 2014.
20   Yin, Robert K. Case Study Research : Design and Methods. Fifth ed. Applied Social Research Methods Series, V. 5. Los Angeles: SAGE, 2014.

In response to that the theoretical framework had been formulated before the start of the case study analyzing procedure, the study of the history of "sharing" in the living environment and the contemporary examples ("The new architecture of the Collective),[21] the theories about relevant residential models ("Learning from co-housing initiatives"[22], and "Profiles of a Movement: Co-operative housing Around the World"[23]). Finally the researches about future of residential architecture and urban systems had been reviewed ("Exploring the brave new world of shared living"[24] and "Cities in the circular economy: An initial exploration"[25]).

That allowed finding relevant cases to analyses, as well as, provided knowledge about what to particularly analyze and look for within this theoretical framework.

Basing on the multiple sources of knowledge is essential for the data reliability, therefore I have looked for case study projects that had been well documented, with existing scientific reports, most importantly with livability assessments conducted by professional parties. That would allow the conclusive part be as close to the factual realm as possible.

IV   ARCHITECTURAL POSITION

As mentioned in the previous chapter, I have adopted the linear-analitic approach towards case study analyses[26] to achieve the most substantiated results via including of descriptive, elaborative and exploratory part of the research.

To add a connection to the question of the direction for future-proof residential development (the theme of my graduation project) I have added theory study of the conceptual visions and predictions within the topic. Critical reflection on each of the cases in relation to the future oriented concepts would constitute of a balanced assessment of those predictions. As an analytical approach, whether those directions possess evidence-based relation within existing built environment.

It is an adaptation of the case study method to achieve an assessment of not realized visions, that are rooted within the existing projects, that possess specific values, conditions. Those consciously chosen cases constitute of a theoretical and practical guideline for incorporation of the newest visions for residential architecture in the built environment.

To conclude the research paper thrived to look for interconnection between the present and the future of the residential architecture, as a response to the problem statement and research question.

I find it essential to analyze the future oriented concepts, conducting beforehand theory studies about the past and the present of the research domain. This future oriented thinking is strongly rooted in my personal observations of the contemporary changes in the built environment.

Like stated in most of the interviews from "Future practice". Conversations from the edge of architecture" [27] there's an ongoing rapid technological, social and economical change in the built environment that architects will have to respond and adapt to.

Especially Indy Johar is elaborating on this topic and changing role of the architect, and broadening his scope of interest and responsibilities. The changing role of the architect is a great threat and simultaneously a great opportunity for the profession. Architects managerial role in the design process could potentially redevelop into creation of spatial conditions, a bigger influence on systems in the built environment. Architects from the role of the elements of the building development process, should become more anthropocentric and interdisciplinary to be able to respond to the complexities of the contemporary built environment[28].

END NOTES:

21   Vitra Design Museum, and Centre D'innovation Et De Design (Hornu, Belgium). Together! : The New Architecture of the Collective. Edited by Mateo Kries, Mathias Müller, Daniel Niggli, Andreas Ruby, and Ilka Ruby. Weil Am Rhein: Vitra Design Museum, 2017.
22   Tummers, Lidewij. Learning from co-housing initiatives. Architecture and the Built environment, 2017
23   CECODNAS Housing Europe and ICA Housing. "Profiles of a Movement: Co-operative Housing around the World", CECODNAS Housing Europe and ICA Housing, 2012.
24   Space10, Urgent.Agency. "Exploring the brave new world of shared living". SPACE10, 2018
25   Ellen Macarthur Foundation. "Cities in the circular economy: an initial exploration.", Ellen Macarthur Foundation, 2017.
26   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013
27   Hyde, Rory. Future Practice : Conversations from the Edge of Architecture. Hoboken: Taylor and Francis, 2012.
28   Hyde, Rory. Future Practice : Conversations from the Edge of Architecture. Hoboken: Taylor and Francis, 2012.

I personally agree that we are living in the times of change, and the necessity for a new role of the architectural practice is evident. It should be considered on many platforms, to respond to questions how research is conducted, how it integrates the newest technologies to it, what is its relation and implementation within design, and finally, how architects will actually design to respond to the recent challenges.

Another necessity is the growing trend of democratization within architecture, the given opportunity to the end user that then possess influence on the built environment. That is more and more present, for instance in form of public consultation of the governmental developments, private commissioning projects in housing or "bottom up" civic society initiatives in the built environment.

I find it essential to develop my architectural practice into a form of co-design, where research and design are interwoven and end users are taking active part in the process. That could lead to my more human oriented, human scaled designs. I agree with the statements about the less ego-centrical approach of the architect claimed by J.Gehl in "Cities for people"[29] and I would like to achieve that balanced approach in the future.

Moreover, I believe in the need of implementation of the newest technological developments for the support of the research and design processes. Technologies like Virtual Reality and Augmented Reality possess the potential to improve the simulation researches and research by design, with much more immersive experience of the process. Especially in context of end-users participation in decision-making process it could constitute of a great communication tool for participants with no architectural background. [30]

I state an evident need for more interactive and immersive research methodologies, that enables better understanding of the process for all of the parties that are involved in it. Architecture is becoming more and more interconnected with various other disciplines, and the need for clear and precise communication between each of the domains. This approach would be supportive, especially for research by design, where either design parties and end users can immersively affect the spatial qualities of the final architectural design. Architects practice should be then highly inclusive for the recommendations and opinions of external parties, preserving naturally the critical reflection on it.

END NOTES:
29   Gehl, Jan. Cities for People. Washington, DC: Island Press, 2010.
30   Wang, David, and Linda N Groat. Architectural Research Methods. Second Edition / ed. Hoboken: Wiley, 2013.

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5. Christ, Emanuel and Gantenbein, Christoph, "Typology transfer – towards an urban architecture", ETH Zurich, 2011
6. Hyde, Rory. Future Practice : Conversations from the Edge of Architecture. Hoboken: Taylor and Francis, 2012. 2012
7. Gehl, Jan. Cities for People. Washington, DC: Island Press, 2010.
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13. Space10, Urgent.Agency. "Exploring the brave new world of shared living". SPACE10, 2018
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15. Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. A Pattern Language : Towns, Buildings, Construction. New York: Oxford University Press, 1977
16. CECODNAS Housing Europe and ICA Housing. "Profiles of a Movement: Co-operative Housing around the World", CECODNAS Housing Europe and ICA Housing, 2012.