Reflection on Graduation Research and Design Process

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Materialisation: TALL Vertical Cities Asia

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In “Research methods and design practices”, written previous semester for the MSc 3 lecture series, I have explained the research and design methodology of the TALL: Vertical Cities Asia studio, today part of the Complex Projects chair:

In order to solve a complex problem one should look at the specific context of that problem in order to find a fitting solution. This solution might result in the creation of even more complex problems if failing to address to core issues of the initial problem. This is exactly what happens, according to Petraeus, former General and commander-in-chief of the United States Army, in situations of war. Without proper understanding of the situation at hand, (old) established tactics and tools are being implemented without knowing its effectiveness, creating even bigger, more complex, problems (Petraeus, 2006).

Petraeus defines the terms: design and planning, two interrelated activities essential for solving problems, which are directly projectable on the field of architecture. Design achieves a greater understanding of a complex problem in order to create a new framework for that specific problem, corrupting the old established framework every time a new and unique situation emerges. Planning in turn applies the currently used tools to this new established framework. Design makes the complexity first rational, then logical and understandable so planning, which is analytic and reductionist, can apply its logic and intuition by breaking the design into manageable pieces, transforming the design into an executable plan through a stepwise process in which each step produces an output necessary for the next step. In short: design is problem setting, planning is problem solving (Petraeus, 2006). The same logic is described by Peña with his theory on programming defining ‘The problem definition phase’ and the ‘problem solving phase’ (Peña, 1987). Without design one would never know in advance if the used planning tools will have any desired effect, or even undesired side-effects. Design does not stop at the formulation of a framework, it will need refinement during the process, i.e. design adjustment, altered by feedback of the outcome of planning. Without planning it is impossible to know if the designed framework suffices (Petraeus, 2006). This cyclical process is also mentioned by Gerald Susman consisting of diagnosing, action planning, action taking, evaluating and specifying, shown in figure 2 (Susman, 1983). In the field of architecture, adjusting the design after its plan is tested, in this case built, leads to complications. For this reason some level of flexibility in the final plan is essential, to allow complexity to flourish.

Figure 2: Action-research diagram (Susman, 1983)
In this graduation studio the first quarter is used for designing, or problem setting. The last three quarters are used for planning, or problem solving. In order to understand the complexity of the subject, Vietnam in general and Hanoi specific, the first quarter is totally occupied by creating a framework for planning by means of making a research booklet. The studio is divided into four groups researching four fields to unravel the complexity: quantitative data, qualitative data, the design-site specific data and one group to understand the theme of the competition: harvesting. After one quarter all the information is gathered and combined making the subject understandable for anyone, the true nature of the problems are visible together with the direction of the solutions.

This is the departure point for the planning phase, where architectural tools are shaped and implemented towards forming a plan which accommodates the existing complexity and directs it into a more sustainable and preferable future. In order to plan for complexity all aspects unraveled in the problem setting phase need to be accounted for, otherwise a shortsighted plan will arise. Hence I do not believe using a single episteme will lead to a fully proper plan serving the complex world. Every aspect requires different episteme in order to find the proper shape and scale of implementation in the final plan. Together all these aspects will be braided into a layered complexity suiting the needs of the subject at hand. Adding more layers into the final composition will lead to a better overall plan.

After the second quarter, which was used for planning the masterplan for Hanoi, the third and fourth quarter of my graduation were used for planning the specific building complex within the created masterplan. As seen above in my previous writing planning is a step by step endeavor where each decision made will have an influence on the next decision which has to be made. Throughout this process a hierarchy of decisions has to be found based on the building concept or the essence of the building.

The methodical approach I used for this planning phase differs from that of the design phase in the first quarter, where the former looks into existing solutions and finds the best fit within the framework, e.g. researching different existing dwelling types from different cultures and choosing the best fit according to the current chosen aspects in the project, where the latter simply collects all the raw data that is available and orders it by subject in order to make the complexity understandable. This is and should be a clear distinction otherwise subjectivity will infiltrate the design process, which will corrupt the design framework and the starting point for planning. Only in the planning phase subjective decisions can be made based on the planner’s experience or preferences next to objective considerations based analytical research.
In “Research methods and design practices” I planned to use epistemes or research methods described in Groat and Wang, 2002, like: correlation research for finding patterns for making vibrant public streets; typology research for finding the proper dwelling type for use in high dense environments; Praxeology research for understanding how to deal with informal activities and expansion drifts of the Vietnamese; and simulation research for finding suitable forms for cross ventilation.

Most of these epistemes made it in the final product, however some of these predictions did not work out the way I planned. I started out doing simulation research with use of software “Autodesk Vasari” for finding the right shape for the building blocks to allow for high wind speeds for cooler living conditions. The outcome of this research was questionable due to lack of precision in the software but mostly due to the fact that this was not the right tool at the right time. Urban layout and block sizes are not solely determined by wind patterns and program, but on a story based on the building concept and for instance by urban patterns described by Christopher Alexander in ‘A Pattern Language’ (Alexander, 1977). Also according to my climate consult mentor these kind of tools are used at a later stadium testing the design, based on other aspects like patterns, adjusting the design slightly accordingly. In other industries like Formula One or Aviation industries, wind tunnels are seldom the starting point for the shape of a design, but much rather a testing place for an already created shape, making it a trial-and-error endeavor. The fact that I chose the wrong tool for the first steps in my planning process meant I was building my project on an urban foundation based on vague wind patterns. The fact that we had little time for the planning phase and were pushed into making a building made me decide to continue developing the smaller scales, hoping that this would solve the underdevelopment of the urban block. It did not. Few weeks before P4 I decided to extend the deadline and redo all the work, starting from the urban blocks, this time making a consistent connection with the masterplan story and using Alexanders’s patterns as a tool for urban development.

Another aspect I misjudged was the use of urban typologies, while the dwelling typologies were rather determined, the block typologies were not. Basically I tried to invent an unprecedented new type of low rise urban block, with a ‘floor area ratio’ of 4.0. While this sounds interesting, my reference projects research proved this density to be nearly impossible to establish and the time restraints before needing to have a finished building and the lack of a proper research setup made this endeavor rather impossible, hence I failed. While restarting my project I therefore also chose to do a simpler, proven, typology: the tower. This decision made the planning process much easier for it literally freed up space to properly plan my building, while inherently giving me the required density from the masterplan.
Bibliography:


