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Dynamics of architectural design : a position paper

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Dynamics of Architectural Design. A Position Paper

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Two Perspectives: Creation and Cognition

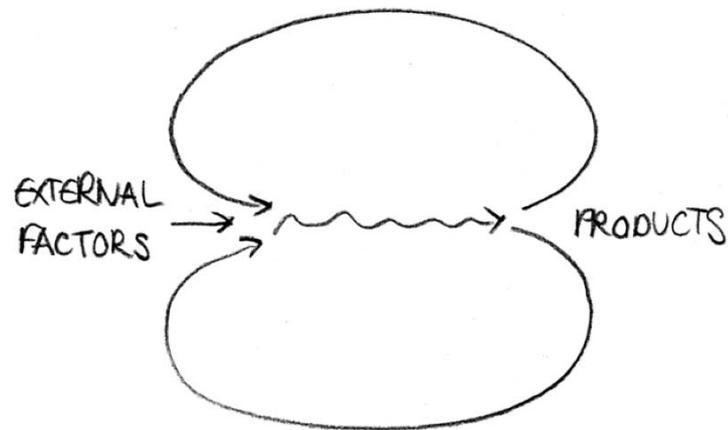
Technische Universität Berlin

Dynamics of Architectural Design

Sabine Ammon

My research interest is in examining design as an epistemic process out of which something novel emerges. The outcome of a design process thus goes significantly beyond what existed at the start. A fundamental aspect of design is that it is a process of both creation and knowing, in which these two activities go hand in hand. Their interplay gives rise to the new: if the focus is on the epistemic process, it results in knowledge; if the focus is on the creational process, it results in artefacts. Looking at the design process in this way reveals two new perspectives, each with a different emphasis. The first perspective looks at designing as creating, developing, and producing artefacts. As a consequence, the focus here usually lies on the edifice in architectural investigations. The second perspective looks at design under the umbrella of the theory of knowledge. Here, the focus lies on designing as a cognitive process. In connecting these two perspectives, we can learn a great deal about the dynamics of design.

Designing: Reinforcement and Multiplication



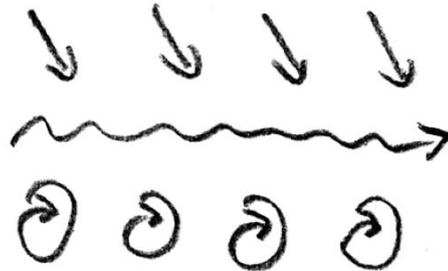
Here it is important to note that the results of the design process enter again into new design processes. The knowledge acquired serves as a basis for the next generation of design, and in this way, significantly influences new design processes. We find that the artefacts undergo a similar effect: they have a significant impact on our living environment, and, in turn, they influence ongoing decisions about future design processes. At the same time, several other factors enter into the design process that are constituted by the contexts in which the processes take place. There are unique individual components as well as a specific cultural and societal background. Due to this circularity, we can identify effects of reinforcement and multiplication.

External processes of transformation

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Looking at the dynamics of design as described thus far, we begin to enter into the manifold processes of transformation taking place. It is helpful to distinguish between internal and external processes of transformation. Internal transformations are those which take place in the design process itself, and which lead to the creation of something new. External transformations are those which are set in motion by the results of the design process. A fundamental characteristic of external transformations is that they have an impact on our living environment. Both knowledge and artefacts trigger changes and modifications in the conditions of this environment. Through the feedback effect in the design process, they can bring about a broad range of developments. On the one hand, they can strengthen and stabilize existing solutions. At the same time, designing is very responsive to influence and change. As a result, either change or continuity can predominate depending on the openness to new developments or conservative tendencies. If changes occur, they can accelerate and multiply significantly due to the feedback loop, which inherently results in intensification.

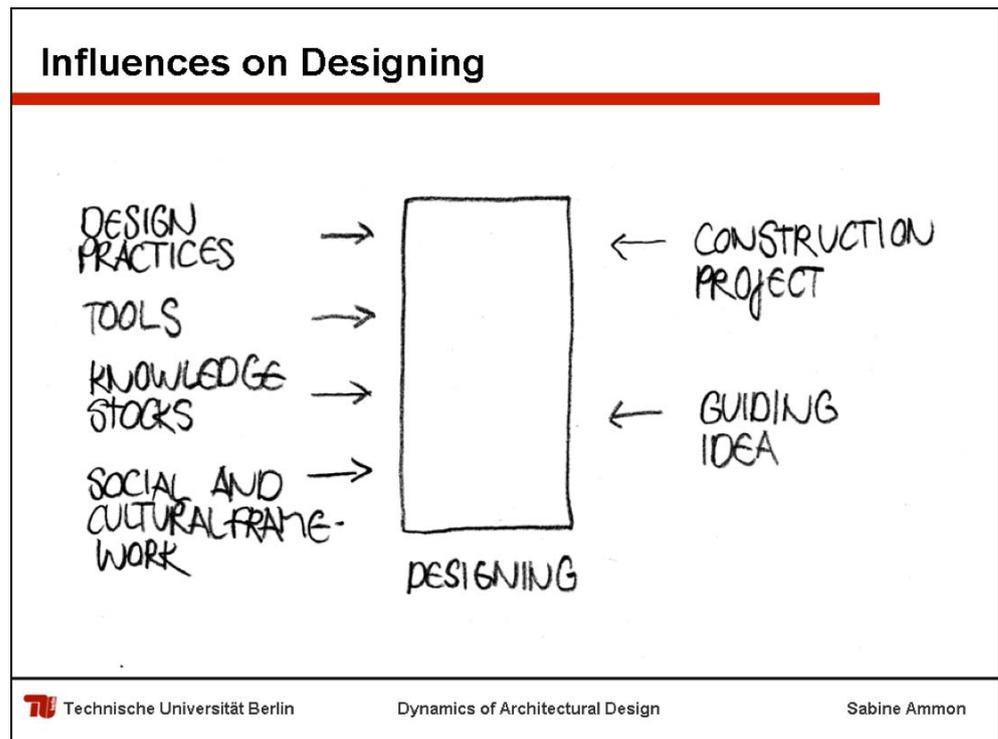
Internal processes of transformation



Looking at the internal transformations, we can learn a great deal about the design process itself. The way I use “design”, the notion describes a comprehensive process. It starts with sketchy early ideas and basic demands and ends with the planning and revision of details, which usually continues until the building is constructed. When the planning starts, it often remains unclear what the actual building will look like. Early constraints include cost limits, ideas of the developer, and constructional guidelines. These early ideas enter into initial sketches that communicate a vague impression of the later building.

Designing is a long-lasting process of specifying, optimizing, and detailing. It can be seen as a complex process of negotiations in which the basic constraints and conditions are defined that will later enter into a solution. It is an active, creative searching and testing that tries out ideas and possibilities, identifies important factors and checks them; it involves weighing and ordering a huge amount of information. The challenge is to fit the criteria involved into a common framework. The new emerges through the process of shaping, reworking, and fitting. Usually, in order to find a solution that works, diverse conflicting factors have to be brought together and negotiated. Numerous modifications and transformations take place: promising ideas are pursued further; ideas that do not hold are dismissed. However, not only the design object is refined and defined; its determining criteria and constraints become clearer and more precise as well.

If the process is successful, the design object takes on sharper contours – although we will hardly ever find an absolute final ending to this process. The process of refinement could go on, but pragmatic constraints usually end the process due to a lack of time and money. If the design is sound and stable, construction can begin. Also in this stage of a building’s development, we find many aspects closely interrelated with the planning stage. Certain details need to be refined; mistakes and unclear aspects are identified and need to be solved. At this stage of the development, we still find revisions and reworking that are rooted in the demands of the building process.

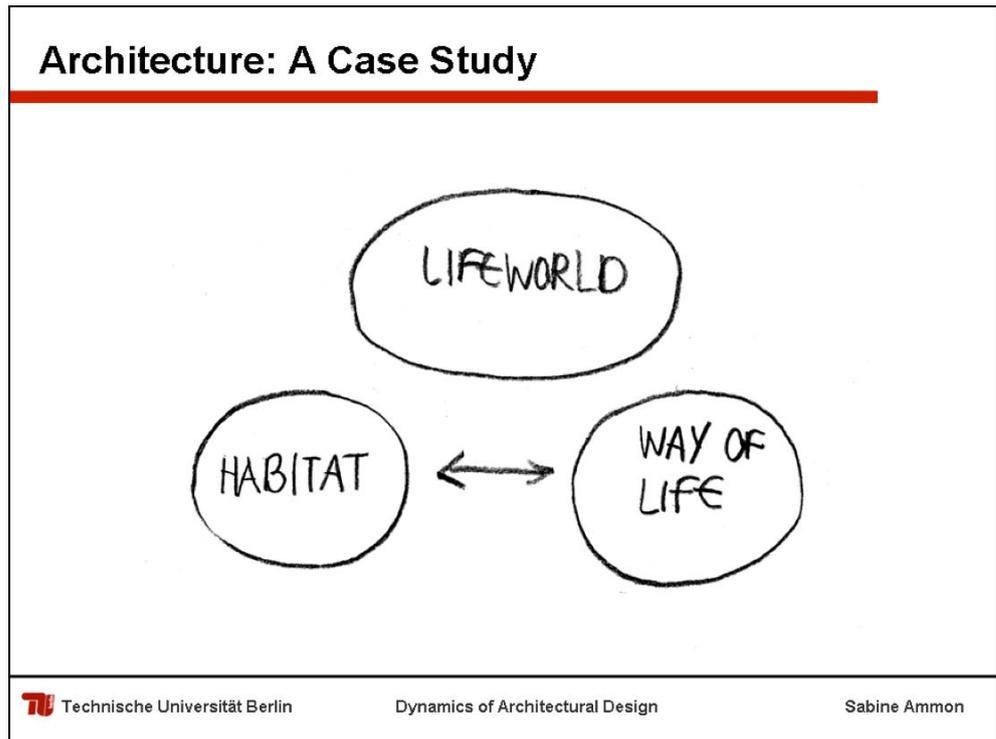


For a provisional overview, we can differentiate six main dimensions that have an impact on the evolving design. The *construction project* itself has a formative influence on the design, describing the individual demands of the particular project. Aspects include the type of building at hand, the size and surroundings, the space allocation plan, ideas and demands of the developer, the budget, and so on. Also depending on the particular project, the design will have a *guiding idea*. Here, the style of the project leader has a significant influence, and her or his trademark will come into play. Then there are more general demands that do not depend on the particular design project. Here we find *design practices*, which depend on abilities, training, and experience. In addition, education plays an important role here. A significant feature of design practices is that the knowledge involved here is usually conveyed implicitly. Also, the communication and structure of the design team and office come into play as well as the role of external experts. But also *tools* have a significant impact on the evolving design. Since drawings and other instruments of visualization serve as a means for developing the design as tools of thinking, they also influence the output. Even the choice of drawing material for the early sketches, the materiality of pencil and paper can already represent certain aspects of the future building. Also the use of computer and software programmes play a role as tools and notational systems impacting the final design. *Knowledge stocks* describe the influence of several forms of knowledge, implicit or explicit, personal or manifested. We have the practical knowledge of the actual building process, techniques and craftsmanship. We have encyclopedias, textbooks, journals, publications of experts; we have databases, norms and regulations. Finally, there is a complex called the *social and cultural framework*. Here we find aspects like how the decisions are made, how the public is involved, how the approval of the administrative body is obtained, and what influence they have on the design. Important concepts here include the process of design and creation; aesthetics; but also ethical aspects, the question of the “good life”, of living, dwelling and working.

Manifestations in the Design Process

- SKETCHES & PLANS
- MODELS & VISUALIZATIONS
- CALCULATIONS & DESCRIPTIONS
- THE BUILT

An important element of the design process is the manifestation. As a process, designing is, in many respects, ephemeral. However, there are several aspects as well as certain stages of the design process which are manifestations. Manifestation means that unique, concrete physical forms emerge. These play an important role in the process of further developing the design. Additionally, they are very helpful for the further investigation of the processes taking place. For example, parts of the knowledge stocks are also manifest as sketches, plans, models, visualisations, calculations, descriptions, and statements. But also built structures can count as manifestations.



In order to explore these questions, architecture is a very fruitful case study for the dynamics of design. Both internal and external transformations become especially visible when we look at examples of architectural work.

On the one hand, designing architecture always takes place in socio-political contexts. Many interests have to be considered. Development and planning processes take place as multistage processes. As this process unfolds, the gradually evolving building is revealed. The design process in architecture is especially accessible because it is institutionalized in many respects. Interdisciplinary intersections are embedded in a multidisciplinary and multi-criteria process. As a result, the structures of decisions and processes that made up a particular development can be traced and investigated.

On the other hand, architecture renders the complex relationship between designing and the living environment particularly comprehensible. The dual character of the *Lebenswelt*, our lifeworld, as both *Lebensraum* and *Lebensform*, that is, as habitat and the structure and parameters of a way of life, manifests itself in the built environment. The built world significantly affects the living conditions of the individual as well as of the society or culture. Architecture is not neutral; rather, it shapes and defines our living environment. What we develop and build has an effect on us. The built environment influences how we live and how our way of life evolves.