System Structures in Architecture

- Constituent elements of a contemporary industrialised architecture

PhD-thesis by Kasper Sánchez Vibæk, September 2011

Resume

The thesis suggests the introduction of the notion of *system structure* in architectural design as a way to conceptualise a systemic level in architecture and construction that lies between general construction techniques and specific architectural results. In order to make such a system structure operational, the elaboration of a *system structure model* has been attempted that seeks on the one hand to analytically grasp and on the other hand to make it possible to actively work with system structures as part of architectural design. Such endeavour has roots in the apparent and continuously increasing gap between architectural ideation and the way these ideas are brought to life as real physical manifestations of our built environment. Although this split between idea and execution can be traced all the way back to the Renaissance, the pronounced specialisation of the industrial era as well as the recently emerging and fast developing information technology has further accentuated this tendency addressed as the main problem of the thesis. Architectural design and construction have become a hugely complex matter and fragmentation of the knowledge needed to comply with the task produces risk of incoherent results. At the same time, however, this information technology has also strongly enhanced the ability to deal with complexity through data processing in quantities that were unimaginable just a few decades ago. New advanced managements tools within all fields based on information technology are introduced on a daily basis and both processing speed and storage capacity doubled within only a few years – while the devices that run these software based tools gets smaller and smaller. The notion of system structure and the proposed system structure model is not an attempt to keep up with this development and follow this track. On a much more basic level – partly defined by the limited scope of a single doctoral thesis – it is seeking for ways to look as this complex reality of construction and architectural design through a different kind of lens that detects and describes coherent wholes of interdependent elements rather than seeking to describe each of these in their outmost detail. In line with the so-called systems sciences present thesis rejects the prevalent scientific view that the degree of detail 'automatically' enhances understanding and explanative power. The concept and the model seek to establish the idea of a systems view on buildings and architectural design that through the use of flexible constituent elements facilitates discussion about how architectural wholes are appropriately put together as assemblages of what the current and future building industry is capable of producing. This is not a reinvention of architecture and architectural creation – it is not an attempt to establish a new architectural paradigm or a different style. It does however represent a new way to *look* at what is already there – an industrially produced architecture – and argues that this new view can help facilitating a more active use of the present and future building industry in order to create *architecture* – not just construction – that is specifically attached to time, place and cultural context – not just expression of smooth processes or cost efficient solutions. Such a systems view is epistemological rather than ontological: A system is in itself always an abstraction chosen with the emphasis on either structural or functional aspects that can be associated with, not identified with the real world physical embodiment – the building.