

New Tools for the Design and Construction of Systems-Based Architecture

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Abstract:

As architects, we often focus our attention on the forms, functions, and impacts of the buildings we design, imagining them as finished products ready for use. New tools, however, are allowing and requiring architects to more fully engage in the processes of realizing the buildings, and these work flows are blurring the distinctions between designing and making, challenging the way we teach, think, and talk about architecture. In both the physical and digital realms we are making models, which are composed of components and assemblies that require us to make choices about tools and materials as we design.

As we work with these tools, we're usually creating components, destined for assembly into a larger constructed whole. At the model scale, we typically work through multiple iterations of testing materials and machines, learning the characteristics and capabilities of each, often adapting our design to utilize what works well from these fabrication processes, or to avoid requirements for materials and processes that have not been successful.

Just as with models, the full-scale buildings we are designing must capitalize on those materials and processes that most successfully achieve our intended goals, and we must learn to adapt and change our design intents in response to the materials and processes that can be beneficially exploited. As the construction industry continues to move towards a more industrialized and less site-crafted structure, we need to similarly adapt our design processes and expectations to recognize a component-based approach, which focuses on the design, fabrication or selection of components, and the assembly techniques of these pieces.

We are at a unique juncture in the development of tools and the roles of architects that make this an ideal time to reconsider how, what, and why we design.