innovation is one reason that professions evolve. Social change, the evolution of "everyday life" and its values, is another. "Faster, cheaper, better!" is the catch phrase of the new economy. Every shaper of the built environment faces these related changes, as clients demand a new responsiveness. Design professionals should rethink linear and segmented processes, reflecting nineteenth-century practices, and begin to envision how everyone engaged in designing and constructing the built environment should approach their practice to achieve the speed, responsiveness, and innovation that clients require.

IMPLICATIONS OF BANDWIDTH: NEW TOOLS, PROCESSES, AND PRACTICES

The bandwidth revolution

The bandwidth revolution has given interior designers an entirely new set of tools–not just for design, but also for collaboration. As is true for most innovations, their early applications were focused on existing practices. Today, though, a new generation of designers is at work who grew up with these tools. As they move into the mainstream of practice, they will start to use them to reshape practice.

Bandwidth is transforming the production process: how furniture, furnishings, and equipment get from designer to manufacturer to end-user. It makes it possible both to speed the production process, by tying it more directly to purchasing, and to consolidate orders to secure larger production runs and better prices. And it creates a world market for these products that should increase their variety.

Bandwidth will also make it steadily easier for virtual teams to work collaboratively, to "construct" a virtual setting in three dimensions. This collaboration takes place not just between people, but between computers, too, so that in time fabrication will follow design without the need for detailed working drawings. As the process becomes more seamless (and more common), it will extend to other aspects of construction. At some point, "design/build" may really be a single process. Currently, we are only halfway there. A lot of the infrastructure is in place, but the interface is still maddeningly primitive.

At the same time, we are trying to use the infrastructure to support traditional practice models. It may take a "push" from the outside, such as another oil shock that makes the price of airline tickets less affordable, to force designers to change their ways and embrace virtual collaboration wholeheartedly.

Thanks to bandwidth, manufacturing has gone from Henry Ford's assembly line, with its uniform products, to Dell's (and now Ford's) "mass customization." Service industries have changed similarly. Across the economy, customers want the cost advantages of mass-market mass production, along with the quality and performance of custom design.

DESIGNING IN FOUR DIMENSIONS

At the same time as

At the same time as clients demand an increased level of responsiveness, knowledge workers demand "consonance" in the workplace. They approach potential employers looking for a "fit" with their values and lifestyles. In a buoyant economy, they can afford to be selective–and intolerant of "dissonance." The built environment gives form to consonance and provides its framework. To keep pace with social and technological changes, design professionals must learn to see that framework as one that changes with time–and therefore design in four dimensions.

The current rate of technological change suggests that designers will face considerable pressure to practice with time in mind. Both the container and the contained–"structure and stuff," as Stewart Brand put it in *How Buildings Learn*–change over time, but at different rates of speed.[11] The trends of mass customization and congruence suggest that settings will change frequently, which puts pressure on the rest to facilitate the change. This brings us back to *sustainability*, which also demands of "stuff" that its residual value be salvaged through recycling and reuse.

Designing in four dimensions means rethinking our conceptions of buildings. "There isn't such a thing as a building," Frank Duffy asserts. Buildings are just "layers of longevity of built components"–they exist in time. What