A New Breed of Design Thinking, Part 2

DAVID BRUER, Intern, Beyond Design

By DAVID BRUER, Intern, Beyond Design

This is part two of a two-part piece. Part one can be found here. *[1]*

The Embedded Model

Another, less referenced model, which reflects on the natural relationships between society, the economy and the environment, is one that views these three entities as embedded systems. In other words, the environment is the system in which society resides, and the economy is a wholly owned system within society.

This model derives its validity from the physical reality that society lives on the environmental system we call earth, and that the economy is a manmade system of trading goods and services that only has meaning within the social system. This model implies that all material resources used in the economy for products and processes must come from the environment, and that the environment must act as a sink for all material waste that our economic system generates. It is also clear that society, as a whole, can be exposed to all that is within the environment.

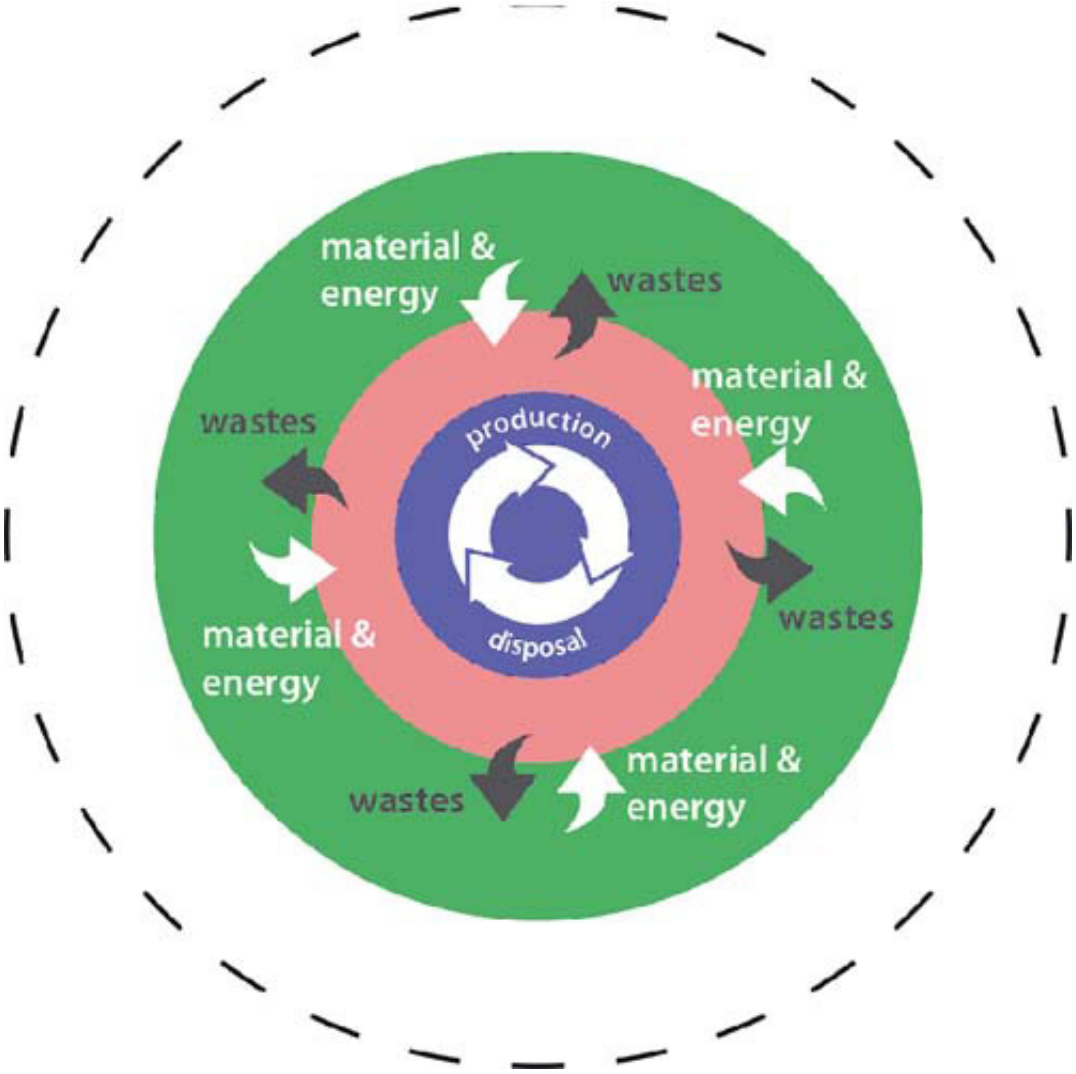
Within the embedded system framework, one can easily see that the health of the economic system depends on the health of the social and environmental systems in which it is embedded. It also promotes design decisions based on the true relationship and interaction between these systems.

Hence, in the embedded systems model, it is clear that sustainable design must inherently address the interactions between society, the economy and the environment.

This kind of thinking encourages us to strive towards a system whose success is mostly dependent on the state of the surrounding environment. With a little deductive reasoning, one can draw on the embedded systems model to realize that we need to design for prevention, not treatment. Treatment both requires resources from the environment and emits waste, whereas designing for prevention simply requires new thinking.

As an example, suppose a designer was asked to design a solution to protect workers when dealing with a hazardous material in the workplace. By viewing these workers as isolated within a conceptual system boundary, one solution could be to design some kind of gloves that the workers could put on when dealing with the material and then throw away in a dumpster after the work session is completed. However, after the gloves have been exposed to the material, they are now hazardous and have thus created a new problem.

Once this “glove solution” is implemented, it is often the case that the solution to such consequences would be further engineering using the same line of thinking. We might try to establish a recycling program for the gloves that require additional resources from the environment, rather than addressing the gloves themselves or even the industrial process originally producing the hazardous material.



This process replicates itself outward to a point of collapse wherein the unsustainability becomes immediately apparent. By using an integrated approach, as the embedded systems model provides, one might seek to instead redesign the system so that toxins in the original material were not used at all.

What Does It All Come Down To?

If the mental models of the designer and design process are dissociated from the larger systems in which the design is embedded, the result will be unsustainable. Our widget-based design of today derives from processes whose negative, global-scale consequences are no longer acceptable. When mental models, such as the triple bottom line, are used to address questions of sustainability, they inevitably fail. In fact, they have created our current situation and cannot change it.

To enable the possibility of truly sustainable design, we need to embrace a new way of thinking that is inclusive of and accounts for the design as embedded within the closed thermodynamic system of the environment, society and the economy, in which financial profit is in direct proportion to the health of the environment.

Making a profit is crucial for any business to thrive. In order to adopt a new way of

thinking about sustainability, such as the embedded systems model, industrial designers and engineers need to have the mindset that qualities of the environment can generate value.

It is a new breed of design thinking and this is what, I believe, needs to happen in our profession to make it truly significant.

What's your take? Please feel free to leave a comment below. To read part one of this two-part series, please click here. *[1] For more information, please visit* www.beyonddesignchicago.com *[2].*

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