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Systemic Design of an Idea Zone at a Science Center

Abstract

In this working paper we bring key systems and cybernetics ideas to the design of an Idea Zone in a large regional science center. Most notably, we bring the ecology and systems approaches of Gregory Bateson and the cybernetic systems design approaches of Ranulph Glanville, to this evolving design project and explore how our learning from this particular case may also inform more general systemic design principles. This includes issues of context at many levels, movement across boundaries, as well as the importance of the design of a communication process for the design of an Idea Zone.

Systemic Design and the Appreciation of Context

A key principle of any systems approach involves an appreciation of context (Bateson, 1979). In doing design, this contextual appreciation can involve the physical/geographical context, the value system of those for and with whom the design process is being enacted, and it can also involve the historical context. All of these different ways of understanding context intertwine in what can be called an ecology of systemic contextual understanding. In this paper, we offer a systemic design process for the design of an Idea Zone in a science center by first recognizing the history of the space in which the Idea Zone is to be designed, and the way in which this history is brought to the present in the embeddedness of the space in its own larger context.

Context of the Scene for Design

The Museum of Science and Industry (MOSI) is a large, 72-acre science center located in Tampa, Florida, USA. It is a prominent feature of the Tampa Bay region and attracts more than 800,000 visitors annually. MOSI attempts to be both a tourist attraction and a learning resource for its community (Steier & Ostrenko, 2000), and in 1995 established the first public library in the country located inside a science center as a way of continuing its commitment to being a learning resource. In the paragraph that follows we offer a detailed description of the library, as its use is important to understanding the history of interactions that people brought with them to MOSI, including those involving learning and play.

Although there was an entrance charge to get in to MOSI, the library itself was free. It was designed in a way that marked its presence as being within a science center, with clear attention to that larger context. In addition to science and technology related books (science and science fiction), movies, magazines, children's books and computers, the space was also replete with scientific diagrams and models, fossils, pinned dragonflies and sharks' teeth. It also contained CD-ROMS and science equipment that were available to be borrowed, such as microscopes, telescopes and various kinds of science kits. The "Science Alcove" contained drawers filled with fossils and specimens. And in its open-use computer lab, there was internet access that afforded looking up more information about things one encountered during one's visit

inside. In other words, it was set up to invite both research and curiosity about the things one might want to inquire about in a science center, while being a resource for learning.

In 2011, however, county budget cuts forced the library to close. In keeping with its commitment to the community, MOSI sought a way of inviting the community to participate in redesign of the library space. With its history of action research projects and a focus on learning conversations at multiple levels of organization, from learning conversations among visitors and floor staff called “Interactors” to learning together as an organization, MOSI invited us to help with this design. To do this, we chose an alternative form of meeting that relies on creating co-evolving networks of conversation - the World Café (Brown & Isaacs, 2005) - to facilitate a process of inviting community ideas for design of the emerging “Idea Zone” being modeled on the MIT Fab(rication) Lab. In setting up the context for the World Café’s designed discussion format, we drew heavily from systems approaches. In particular, from Bateson we built on his orders of learning (1972) as well as his ecological perspective on recursive patterns of all human communication (1979). Glanville’s work (2009, 2012) on cybernetics and recursion also featured prominently. Most notable is Glanville’s emphasis on design as conversation, and the multiple roles that designers take on (viewer, drawer, constructor, for example) as understood within a systems and cybernetic framework (Glanville, 2006). In addition, specific to the historical and physical context of the Idea Zone is Glanville’s (2003) recognition of the importance of the “buffer” as a key systems and cybernetic principle, as the library (and the newly designed Idea Zone) occupy a space that is both inside the museum and outside it (although physically inside, it did not require the entry fee for the museum, for example, and conceptually also was a link to the “world outside”). As a buffer, it was possible to think of the Idea Zone as affording different and transitional levels of learning and play.

Key Features for Attention in Systemic Design of the Idea Zone

In building on the work of key systems thinkers, we sought to holistically design a communication process for design of the Idea Zone. By undertaking this effort within an action research framework (Greenwood & Levin, 2007), a number of key features emerged through a participatory design engagement process. Two of those key features include the larger context of design and the embeddedness of design in that larger context, as well as how systems ideas inform efforts to focus attention on the design *process* (contrasted against a focus primarily on design *products*), and in particular on the conversational process of designing (Glanville, 2012).

In our attention on the embeddedness of design in larger contexts, we had to focus not only for the physical space of the Idea Zone and how it fit in to the whole scene at MOSI, but also for the relationship of MOSI within the broader scene of its community - geographically and professionally. We explore how an understanding of MOSI’s location (in Florida) related to the variety of frames (in Bateson’s sense) of visitor engagement with the space. More broadly, too, the embeddedness of MOSI within its community of science centers also informed the design process, particularly as MOSI seeks ways of connecting to the Civic Science scene as well as other ways of inviting public dialogue in key controversial issues.

A second key feature that emerged in relation to systemic design was the recursive and mutual connection among the design process and the communication process of design. Here, the World Café, with its systemic basis, allowed for seeing the parallel work of designing communication process for design and the work of designing the Idea Zone space as metaphors for one another (Thompson, Steier & Ostrenko, 2014). Building on how Glanville highlighted that a design problem is not understood until after a solution has been formulated through designers' conversations (2012), these recursive metaphors afforded opportunities to see the conversational process of design (and the attendant challenges of doing design in a participatory way) as part of the larger design "problem" such that communication might become a jointly designable feature of the Idea Zone design space and also inform the larger exhibit/exhibition design process within MOSI. Both separately and together these key emergent features point to ways that systems ideas (and in particular the action orientation of second-order cybernetics) may inform participatory design practice through attention to communication process and patterns.

We focus on context, product, and process as three constituent parts of systemic design, but then also on a fourth key aspect of design: the inter-relationships among context, product, and process. Importantly, these inter-relationships emerged through and were attended to in ways that afforded key stakeholders, to include MOSI and its communities, spaces where shared futures might be explored together jointly through dialogues designed around mutual learning. As this project was very much about designing learning spaces in many senses, it also opened up space for our own learning, in collaboration with the MOSI community. We highlight some of those emerging ideas below, framing the ideas as questions for further expansion.

What We Learned: Key Systemic Design Principles That Emerged

- *How might the recursiveness of designing communication for design be a leverage point for mutual change?* Through attention to the recursive relationship of designing communication for design of the Idea Zone, what emerged in part was a "third language" that was not only that of the community or that of designers, but of the group together (Thompson et al., 2014). This third language involved not only spoken communication but also through sketching and drawing together during the World Cafés. In that designing communication informs design process, which enables the ongoing redesign, which opens new possibilities for future communication, and so on, the recursive relationship among communication and design (Nelson, 2008; Glanville, 2012) afforded opportunities to develop shared senses of change.
- *How might designed discussion formats (such as the World Café) afford a frame of learning conversations at multiple levels of organization?* When attending to the needs of others through conversation and a frame of learning in an organization such as through the World Café (Brown & Isaacs, 2005), not only do stakeholders learn about their own learning as Bateson (1972) described, they also begin to learn about others' learning. In this way, design leadership is able (together with other stakeholders) to build on the context of

learning at multiple levels of organization; or, in other words, to foreground learning as an organizing principle of the organization.

- *How might design teams hold on to paradox, dilemmas, and conflicting frames as generative of new possibilities?* In that the process of finding needs of others for design is a paradoxical process of looking for something that's missing (Faste, 1987), design can also be a scene where “problems” generated through conflicting frames and dilemmas offer room to develop new ways of relating to the problem (Schön, 1979) and new ways of acting in non-trivial situations (Glanville, 2012).
- *How might exploring metaphors through conversation afford space for creativity and “muddling through” (in Bateson’s sense)?* In drawing on relationships organized through a concept from outside the immediate context, metaphors can provide ways to reframe or organize in new ways (Madsen, 1994; Schön, 1979; Bateson, 1972) the “muddles” that develop as a design evolves into *the* design (or not). In offering new possibilities for relating to “the problem” at hand, design metaphors create space (literally in the sense of the World Café) where a working understanding of joint needs might emerge to inform new, shared designs for the collective future and keep key need for “the” eventual design in play (Thompson et al., 2014).
- *How might multiple layers/levels of a complex organization become engaged in design conversations together with other stakeholders and communities?* Building on the idea of featuring learning as a key organizing principle of an organization, the role of leadership, and particularly of design leadership as it emerges in forms of effective design communication (Nelson, 2008), plays a key part in guiding design of communication for design in complex organizations. Through “serious play” such as the design processes modeled in Kelley & Kelley (2013), joint work can take place not through hierarchy or authority but rather through alignment of guiding purposes.
- *How might ecological design and systems principles inform healthy change/stability cycles?* For Bateson (1979) and others, living systems such as groups of designers and stakeholders and non-living systems such as designed objects or services are joined through communication in recursive relationships such that change and stability might be guided in part through communicating about communication. Systems principles and ecological design together with a focus on communication patterns place change within the scope of human purpose and action – in contrast to perspectives such as technological determinism.

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