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Toward the integration of visual languages for systemic design

Jones, Peter

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Toward the Integration of Visual Languages for Systemic Design

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Systemic thinking is better expressed in design languages than system formalisms. Understanding of complex systems is enhanced for a wider variety of stakeholders.

Visual design languages offer significant potential for social & service systems design.

Generative bias as opposed to descriptive science
why a design language for systems?...

*design*   is changing ...  

Design thinking is extending beyond *design outcomes*, but is falling short of *systems methods & toolkits*. Design approaches differ from systems in many respects:

- Successive approximations toward emerging goals
- Continuous interpretation by multiple perspectives
- Action-oriented, making artifacts & prototypes
- Visual representations, from sketching to blueprints

*However we still lack good theory & practices of systemic design.*
Design thinking also deals with **complexity**.

Design must become more **systemic** - as we are confronted with wicked problems.

Highly **complex domains need new methods**

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<th>Design 1.0</th>
<th>Craft design, Advertising</th>
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### don’t we have good visual models in systems?

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Recently?
what are the purposes of systems theory?

To understand *actual systemic phenomena* in complex systems?

To better communicate knowledge of *systemic patterns* affecting social & ecological outcomes?

To better organize sociotechnical systems?

Why not *innovation*, or to design significantly better systems for complex?
why has Systems Thinking ignored Design?

Systems & Cybernetics grew from scientific disciplines. Creative fields were not taken seriously.

Systems theorists redefined design in Design Science terms.

Simon | Design Science (Sciences of Artificial)
Fuller | Comprehensive Design Science
Warfield | Generic Design Science (ISM)
Christakis | Dialogic Design Science (SDD)

By reframing design, cybernetics assumed it captured relevant processes.

Times change. Design has caught up to systems thinking.
WHICH FIT WHERE IN SYSTEMS LINEAGE?

Based on R. Horn, 2004, Adapted with permission.
“Though a handful design thinkers have made some substantial contributions to systems thinking in general, hardly anybody has developed a systems practice from within design, specially informed by design thinking and design practice. This is remarkable when we compare us with other fields where proprietary adaptations of systems perspectives are normal.”

Birger Sevaldson, Oslo School Of Architecture & Design
Giga-Mapping: Visualisation For Complexity & Systems Thinking In Design
Nordic Design Research Conference 2011
the new approach to SOCIAL SYSTEMS DESIGN

Service systems *are* social systems, as are:

* Social innovations
* Sustainable business models
* Network organizations
* Communities of practice
* New learning institutions
* Transparent markets
* New (sustainable) economies
* Emerging political structures
EXAMPLES

Design Thinking in HEALTHCARE SERVICES
as services become MORE COMPLEX

Atrial Fibrillation Care (visualized)

Many health services treat chronic & complex illness as exceptions. Patients fall between the cracks & are shuttled around, getting fragmented care. By not adapting to the changing reality of the chronic demographic, costs rise as hospitals increase their exception cases.

Atrial Fibrillation Aftercare Pathway

Human-Centered Design is not inherently systemic. Individual experience enhancement is an outcome of healthcare service.
DESIGN ATTEMPTS at VISUALIZATION are insufficient

Human-centered Design is not inherently systemic. The improvement of individual experience is an effect in healthcare. Nice but not systemic. Service systems reinvent institutional practices & business models.

DESCRIPTIVE SYSTEMS METHODS And DESIGNERLY PRACTICES
the use of Interactive Sketching
unpacking the problem aspects
highlighting connections for visualization
Visualization of **PATTERNS** and timelines
making sense through visualization & critiques
The delay that exists for government to make funding, training and policy decisions significantly reduces the effectiveness of the balancing loops it seeks to create. There is also a delay inherent within the flow of the supply chain itself as medical school is typically four years, and residency is two years for family medicine.
The average age of family physicians in Ontario is 52 years old. 9.8% of family physicians in Ontario practice in rural communities, whereas 13% of Ontarians live in rural communities. One third of physicians in Canada practice family medicine, but to meet the need, it should be closer to one half of all physicians.
Uncovering root causes and Influence Mapping

What are the most significant issues affecting the quality of healthcare in Ontario? The outcome of this Interpretive Structural Modelling session was the influence map shown.

Healthy Healthcare

Oksana Kachur, Jonathan Resnick, Karl Schroeder, Social Systems project, Strategic Foresight & Innovation, OCAD U
Influence Mapping and points of intervention

Map generated in collaboration by Warfield’s Interpretive Structural Modeling (ISM) model with Cognisystem II

Intervention via deep drivers
the GIGAMAP as a visual synthesis
1 Characterization

Understanding the purpose, functions, & behaviors of a (social) system
Learning systems principles in a design context

Course in OCADU Strategic Foresight & Innovation MDes:

*Understanding Systems & Systemic Design*

Originally 2 courses: 6 modules, 2 projects

- Systems concepts
- Natural systems
- Social systems & service systems
- Social systems & design methods
- Structured dialogic design

Rheinfrank, J. and Evenson, S.
Implications for PEDAGOGY

Learning systems principles in a design context

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**Gharajedaghi & Meadows texts**

- *Iterative system mapping*
- *Small team map & analysis*
- *Gigamapping*
- *Global problematique*

+ Depth readings

- Ostrom, Hollings
- Rittel, Buchanan
- Beer, Spohrer, Warfield
- Christakis, Ozbekhan

Build on a base of design thinking.
Visual language integrated throughout, required with every project.
Builds base for systemic design for foresight-led innovation.
Thanks.

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Strategic Innovation Lab   sLab.ocadu.ca