



Peter Morville

The System of Information Architecture

Editorial

If a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves ... There's so much talk about the system. And so little understanding.

Robert Pirsig, Zen and the Art of Motorcycle Maintenance, 1974

Systems Thinking

Recently, while writing an article about being an information architect, I found myself reading the Wikipedia entry on “systems thinking” where I discovered John Gall and his 175 book *General Systemantics* which I promptly borrowed from my public library (via inter-library loan). Since it's impossible to sum up this witty, irreverent text about how systems work and why they fail, I'll offer you this pericope [1] instead:

When a system is set up to accomplish some goal, a new entity has come into being: the system itself ... Whereas before, there was only the problem, such as warfare between nations, or garbage collection, there is now an additional universe of problems associated with ... the new system.

In the case of garbage collection, the original problem could be stated briefly as: 'What do we do with all this garbage?' After setting up garbage-collection system, we find ourselves faced with ... questions of collective bargaining with the garbage collectors' union, rates and hours, collection on very cold or rainy days, purchase and maintenance of garbage trucks, millage and bond issues, voter apathy, etc.

Although each of these problems, considered individually, seems to be only a specific technical difficulty having to do with setting up and operating a garbage-collecting system, we intend to show that such problems are really specific examples of the operation of general laws applicable to any system, not just to garbage collecting. For example, absenteeism, broken-down trucks, late collections, and inadequate funds for operation are specific examples of the general law that LARGE SYSTEMS USUALLY OPERATE IN FAILURE MODE.

Again, if the collection men bargain for more and more restrictive definitions of

garbage, refusing to pick up twigs, trash, old lamps, etc., and even leaving behind properly wrapped garbage if it is not placed within a regulation can, so that eventually most taxpayers revert to clandestine dumping along the highway, this exemplifies Le Chatelier's Principle: THE SYSTEM TENDS TO OPPOSE ITS OWN PROPER FUNCTION, a basic law of very general application.
[2]

This “way of seeing” a system as different from the sum of its parts and more out of control than most realize resonates with my experience as an information architect. We who labor at the crossroads of structure and behavior have learned the hard way that content management is far messier than garbage collection [3] and “the system always kicks back.”

Of course, that doesn't deter us from modeling and meddling, which brings us to the stock-and-flow diagrams of “*Thinking in Systems*”. In this posthumously published book, Donella Meadows reveals another vital link between systems thinking and information architecture:

There is a problem in discussing systems only with words. Words and sentences must, by necessity, come only one a time in linear, logical order. Systems happen all at once. They are connected not just in one direction, but in many directions simultaneously. To discuss them properly, it is necessary to use a language that shares some of the same properties as the phenomena under discussion. [4]

Both practices require a visual language for analysis and design. While we may rely on sitemaps and wireframes for nonlinear modeling, the stock-and-flow diagram is the tool of choice for the systems thinker.

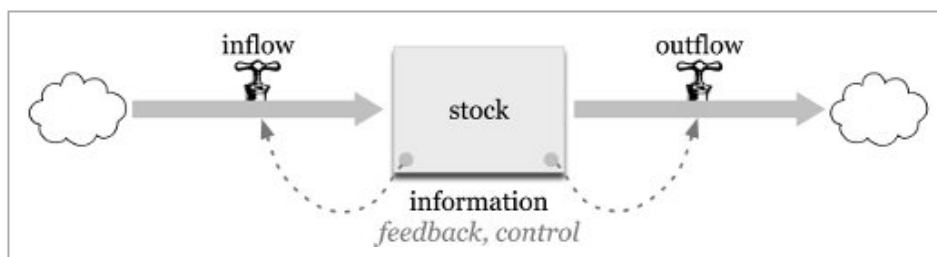


Figure 1

Imagine a “bathtub system” in which a stock of water can be increased (turn on the faucet) and drained (take out the plug). Control is exercised based upon information about the water level and temperature (the feedback loop).

The simplest include only stocks (elements) and flows (inputs/outputs), while more complex models integrate the feedback loops, limits, and delays that together produce growth, self-organization, hierarchy, oscillation, dynamic equilibrium, resilience, and collapse. This simple language can describe the

most complex of phenomena, and it's destined to shape the future practice of information architecture. Let me explain.

Information Architect as Systems Thinker

Information architects are inveterate systems thinkers. In the Web's early days, we were the folks who focused less on pages than on the relationships between pages. Today, we continue to design organization, navigation, and search systems as integral parts of the whole.

Of course, the context of our practice has shifted. Increasingly, we must design for experiences across channels. Mobile and social are just the beginning. Our future-friendly, cross-channel information architectures need to address the full spectrum of platforms, devices, and media.

This has inspired our community to shed the web-centric worldview in favor of a medium-independent perspective. Jorge Arango captures this nicely in *Architectures* in which he argues that where architects use forms and spaces to design environments for inhabitation, information architects use nodes and links to create environments for understanding.

Cross-channel also draws upon our strengths in frame analysis. It's no longer okay to build a website and then talk about mobile, social, and search engine optimization. These systems are all intertwined. Asking simple questions about scope early in the process (e.g., do we really want to build this mobile app before articulating a cross-channel strategy?) can dramatically change the outcome. While "defining the damn thing" can sometimes be unproductive, our ability to select the right frame of reference and properly bound the issue is more important than ever.

We must also be ready to tackle the deeper integration of information, people, and process. As websites evolve from communication channels into places where work gets done, we must address the inputs, outputs, and feedback loops, not just the static information to be presented. Our websites are no longer simply reflections of the organization. They are extensions of the organization that change its nature. The tail now wags the dog. The rapid rise of web governance and content strategy in recent years suggests this new reality of websites as complex adaptive systems.

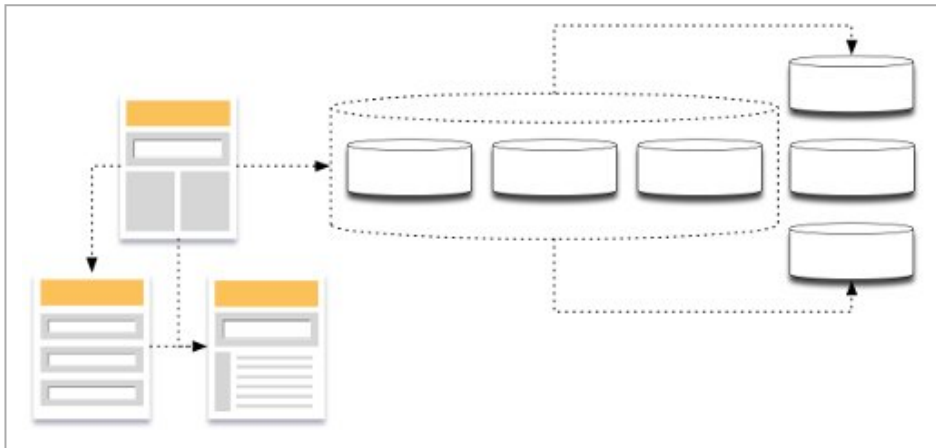


Figure 2

In an era of cross-channel experiences and product-service systems, it makes less and less sense to design sitemaps and wireframes without also ...

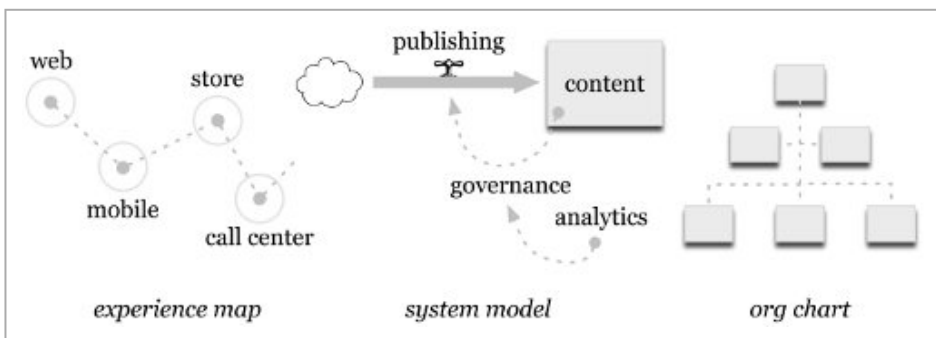


Figure 3

... mapping the customer journey, modeling the system dynamics, and analyzing impacts upon business processes, incentives, and the org chart.

Yet another perspective that we share with the systems thinkers is our uncommon belief in the strategic value of information:

Information holds systems together and plays a great role in determining how they operate. Most of what goes wrong in systems goes wrong because of biased, late, or missing information.

Adding or restoring information can be a powerful intervention, usually much easier and cheaper than rebuilding physical infrastructure. 5

We understand that while people who desire change often focus on the most visible elements or nodes of a system, it's the invisible connections and

structural relationships (e.g., rules, flows, maps, paths, links, loops) that afford the most leverage.

The System (or Space) of Information Architecture

Donella Meadows tells a wonderful story from the 170s about electric meters in Dutch houses. Near Amsterdam, a subdivision was built with houses that were identical except for the position of the electric meter. Some meters were in the basement while others were in the front hall. Over time, the houses with visible meters (in the front hall) consumed 30% less electricity. In Donella's words:

It's an example of a high leverage point in the information structure of the system. It's not a parameter adjustment, not a strengthening or weakening of an existing feedback loop. It's a new loop, delivering feedback to a place where it wasn't going before. [6]

It's intriguing to consider the Journal of Information Architecture in this context. As the first scholarly journal dedicated to our field, it's a "new loop" that's bound to change the system of information architecture.

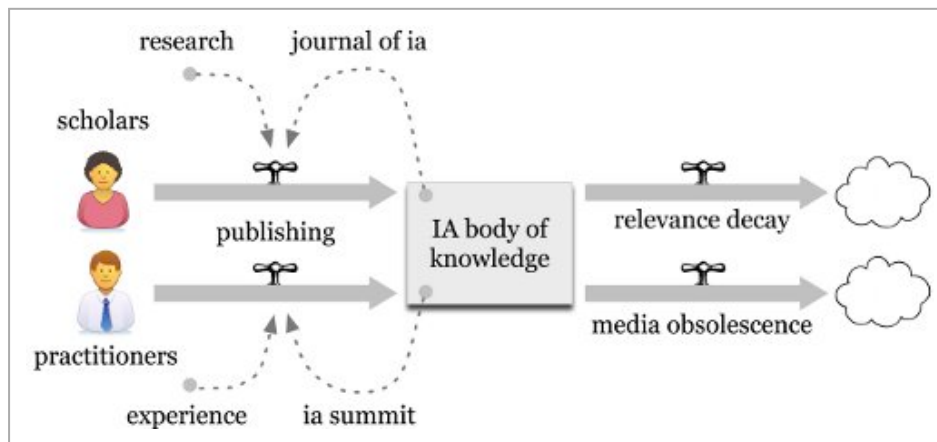


Figure 4

The journal affords citations and visibility, thereby presenting scholars with an incentive to conduct and publish research on the subject. Of course, this simple model ignores the influence of the journal upon practitioners and of the summit upon scholars. Both serve as vibrant meeting places for the best and brightest from academia and practice.

Therein lies the promise and peril of all maps: they omit more than they include and raise more questions than they answer. Nevertheless, as our

systems thinking colleagues would remind us “everything we think we know about the world is a model” and “language as articulation of reality is more primordial than strategy, structure, or culture.” As information architects, it’s our responsibility and privilege to experiment with maps, models and languages; and to ask lots and lots of questions.

In that spirit, I’d like to conclude with a few final quotes and questions:

- People often sacrifice resilience for stability, or for productivity.
- Changing the length of a delay may utterly change behavior.
- Pay attention to what’s important, not just what’s measurable.
- The right boundary for thinking about a problem rarely coincides with the boundary of an academic discipline, or with a political boundary.
- Paradigms (the mindsets from which goals, structure, rules, delays, and feedback emerge) are the sources of systems. [7]

For each of these quotes, ask yourself: How does this apply to the systems we design? How does this apply to the system of information architecture?

For instance, how might we employ research to improve the resilience of our information systems and of our community of practice? [8] Are our existing institutions (e.g., IA Institute, IA Summit, Euro IA, World IA Day) sufficient, or is there a need for new loops and interventions? Is information architecture a discipline? Or, is it a space between forms, more link than node? Finally, what’s the paradigm of information architecture, and what are its goals? What would it mean for our system to oppose its own proper function? What would be our equivalent of learning that the earth is not the center of the universe? I don’t know the answers, but I’m grateful that we have a place to ask these questions and a community dedicated towards understanding, because as John Gall advised “*the meaning of a communication is the behavior that results.*”;

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Footnotes

[1]. In *Architectures*, Jorge Arango defines a pericope as “a special type of node that continues to communicate its intended meaning even when experienced outside of its originally intended context.”

[2]. Gall 1975.

[3]. In “*Divining a Digital Future*”, Paul Dourish and Genevieve Bell explain why we’re repeatedly surprised by messiness: “But postulating a seamless infrastructure is a strategy whereby the messy present can be ignored, although infrastructure is always unevenly distributed, always messy. An indefinitely postponed ubicomp future is one that need never take account of this complexity.”

[4]. Meadows 2008.

[5]. Meadows 2008.

[6]. Meadows 2008.

[7]. Meadows 2008.

[8]. Campbell & Fast 2006.

Cite as

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Peter is a pioneer of the fields of information architecture and user experience. His bestselling books include “Information Architecture for the World Wide Web”, “Intertwined”, “Search Patterns”, and “Ambient Findability”. He has been helping people to plan since 1994, and advises such clients as AT&T, Cisco, Harvard, IBM, the Library of Congress, Macy’s, the National Cancer Institute, and Vodafone.

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