Keepers of Structure

In Conversation with Nathaniel Davis

Sarah A. Rice

rice@seneb.com

Nathaniel is the Founder of Methodbrain, an information architecture consultancy specializing in user interface structural engineering and advocates for the advancement of information architecture. He established the DSIA Research Initiative to investigate information theory and how it translates to methods to improve human interaction in complex information environments. Nathaniel has over twenty five years of experience working in web design and technology with Fortune 100 companies and with startups. He is a regular contributor to industry journals and conferences.

Q: How did you first become interested in information architecture?

I come from the marketing and communications field and was introduced to the web in the mid-1990s when it was called "new media." After a few years of trial and error, I became interested in understanding how to transfer print-based visual communication and language strategies into this more highly interactive medium offered by the web. At the time, it was a new landscape that had a few best practices. There were many disciplines coming together quickly and everyone was trying to figure things out.

Computing user interfaces had been around for decades. But the web was brand new. It made computing available to literally everyone. Masses of people. Computing was no longer reserved for geeky computer folks, large businesses, researchers, or other types of subject matter experts. Coding, designing, and interacting with user interfaces became accessible to practically anyone. It was a whole new game.

I did everything in the beginning, from strategy and design to coding to client relations. As the project-level challenges grew, the systemic responsibility of keeping track of assumptions that impacted the interface increased. I saw this as the biggest risk to success, so it became my new obsession.

When looking for a new job, during the dotcom bust, I eventually came across the term "information architect" on a job board. An information architect was someone who wore many different hats in order to figure out the complex aspect of making sense of an interface for those who wanted to use it. I embraced this general description at the time because it was a label that fit what I was doing.

I worked as a team of one for several years and as I sought deeper insights into what I was doing, I eventually came across books by Rosenfeld and Morville and Richard Saul Wurman, as well as a community of others who were doing similar work.

Q: You attended the first Roundtable. What role would you say that the Roundtable plays in the field of information architecture?

That's correct. I participated in the first one. The intent of the Roundtable is very important. Cross-pollination between academics and practitioners helps to build and sustain a connection that we need. The connection provides a more rigorous and thoughtful approach and line of thinking. Nothing is off-limits. The Roundtable approaches challenging questions and posits big ideas that have an impact on our domain. Participants then get to think about moving from theory and hypotheses to practice. Many of us realize that practice is an essential path to validating hypotheses. The Roundtable, as well as the Journal of Information Architecture, has played an important role in promoting formal discourse and maturity in our field.

The biggest challenge has been to keep people interested in attending over the years. Each side, academics, and practitioners, have different perspectives. What are their incentives to attend? Academics need to publish. In my opinion, practitioners need to publish a lot more than they are today, but I feel there are fewer incentives for them to do so. Right now, the Roundtable does the heavy lifting to engage practitioners in sharing their insights and interests. I'm sure it's a thankless task, and I'm encouraged that it has survived over the years.

I remember now, that the theme of the first Roundtable, "Reframing Information Architecture," was a motivating factor in a poster that I presented at ASIS&T Information Architecture Summit 2014 called "Information Architecture Schools of Thought" (fig. 1). It was based on a few articles and posters on "IA Schools of Thought" and framing for a couple of years prior to the poster.

The outcome from the first academic Roundtable effort helped to expose a range of ideas that were of intellectual interest to the field. My research poster segmented these and other insights into areas of specialization (using an approach that I developed). A key observation of the poster was that any framing of information architecture should be inclusive of multiple problem spaces as opposed to articulating a single and potentially restrictive frame.

While early reframing efforts and the first Roundtable did not influence my practice or approach, they did heavily influence how I positioned my practice in relation to others.

For example, when referring to the model shown in the poster (fig. 1), I can now express how I spend my energy on the left side of the continuum (classic), while we could demonstrate how Andrea Resmini, Dan Klyn, and Jorge Arango have made valuable contributions to the right side of the continuum (contemporary).

The classic and contemporary schools of thought presented in the poster are like the dichotomy of classic and quantum mechanics found in physics. They are ways of understanding the same thing (physics) at different scales and with different lenses. Classic and quantum mechanics are equally important to the field and their application in practice.

I would argue that the activities around how information architecture practice was being framed over the years reached a level of maturity by 2014. This growth was heavily influenced by reframing efforts and the first academic Roundtable. My own first major synthesis of information architecture framing as a practice was titled "IA Schools of Thought - Beta" and was published in 2013.

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Information Architecture Schools of Thought v.1.0
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Information Architecture Schools of Thought
A reference guide for communicating the scope and value of information architecture for Web interfaces

Classic School
The creation of information structures that support the relevant use of content in web environments

Contemporary School
Indeterminate system thinking, synthesis, and framing for digital, abstract, and physical contexts

IA : Infrastructure	IA : Engineering	IA : Design	IA : Architecture
The frameworking of essential information properties within a domain	The structuring of an information environment to support its design.	The creation of proximal and temporal relationships within an information environment.	The holistic strategy for information environments across abstract and physical domains.

Architecture · · · SCIENCE · · · ART · · · Infrastructure

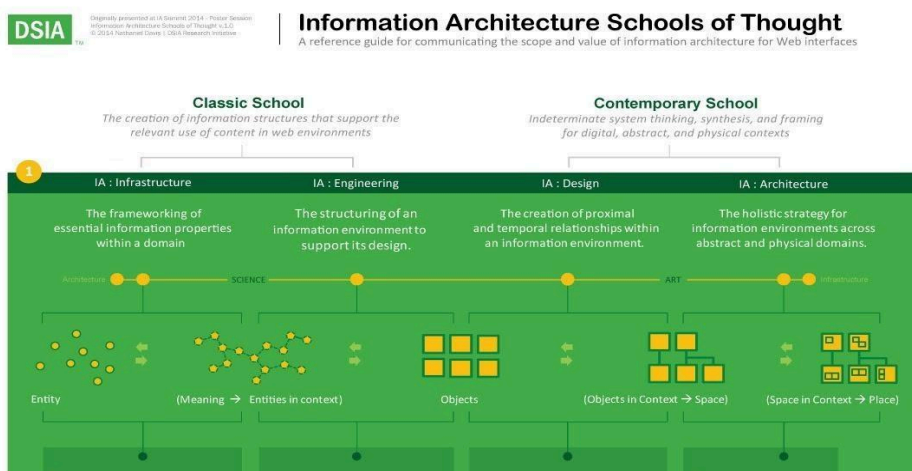| Entity | (Meaning → Entities in context) | Objects | (Objects in Context → Space) | (Space in Context → Place) |

Fig. 1 Information Architecture Schools of Thought (2013)

Q: What does information architecture as a field need to be asking right now?

People interact with a spectrum of various devices, physical space, and time. Where is the information? Where are the information environments? How do we scope the environmental context so that we can clarify the edges for anyone working on a project? When we recognize that a set of targeted information behaviors take place within a larger ecology, how should that be used to impact strategy and design?

For me, this line of questioning comes from the desire for an epistemic basis for the nature of information -- meaning a way to be specific about what we think we know about information. This would, for example, allow us to posit the properties and attributes of information and then correlate such understanding to the projects we work on to add a degree of confidence and even predictability to our recommendations. This kind of thinking is clearly within the realm of information science and the philosophy of information and is an area where I tend to focus.

The complimentary side of informational behavior is its relationship to human behavior. This is when we consider the impact that human and ecological systems have on the design of a user interface and is where information architecture expresses its affinity with the user experience discipline. I make this delineation to suggest how information architecture connects with user interface- and user experience-based disciplines.

By the end of the 1990s, information architects were today's user experience designers and the "land" that information architecture was grabbing was a recurring debate. In the early 2000's Boersma's T-model argued how information architecture was just one of many disciplines that contributed to the creation of effective user interfaces and proposed the scope of the budding user experience design practice. In 2011, I derived the user experience design practice verticals model that enumerates the areas of interest for each discipline. In this way, I was able to clearly show information architecture's contribution in the context of other disciplines. Since the rise of user experience practice, information architecture has had to come to terms with its purpose.

I have noticed that how I think about information architecture tends to be similar to how others are talking about it, even if we are using different language. I've seen others write about ecologies, information environments, and context. In particular, I follow the work from Resmini and Klyn. We may have different lenses and approaches; we may study different patterns and phenomena, and use different labels. However, we share a similar appreciation for systemic thinking and at the conceptual level, there is a lot of similarity in our work.

As we continue to evolve our approaches, it will be important to ask, "How do we position information architecture as a *best practice* (leveraged by anyone) and *professional practice* (performed by specialists with deep subject matter expertise)?" We've had less success with the latter. However, despite our challenge to get companies to invest in information architecture-related matters, the underlying issues that birthed this field have only increased. I'm convinced that market interest will come full circle and when it does, we'll need better arguments and evidence as to why information architecture is good for business, digital teams, and even society.

Q: Would you agree if I say that the information architecture community has not been able to consistently explain its value to business in a way to remain viable over the years? And if you do, have you found ways to handle this issue?

I agree. I feel that this is complicated by the fact that the natural topic of information architecture is quite abstract in nature compared to more tangible subjects like interaction and visual design. Over the years, our critical discourse has been mostly esoteric with theoretical and philosophical overtones. So, it's important that we find ways to transition our intellectual insights to practice. I try to remain mindful of this by asking myself, "How do I move my ideas forward?" When I come across an interesting hypothesis and a conclusion that seems sound, I will think, "How does this extend what I already know and how is it relevant in practice?" This line of questioning has been central to my practice over the years and has grounded my efforts to build new insights and discipline through a form of practice-led research.

I'm busy making observations, building a technical vocabulary, and maturing my practice. But, finding ways to effectively communicate the essential nature of my skills is equally daunting. Over my career, I've had to constantly work in parallel to understand the language and mental model I needed to communicate the value of IA practice, in less technical terms, to others or even my next manager. I've learned to be cautiously optimistic because value can be subjective.

Q: What basic concepts have you focused on that are foundational for information architecture?

For me, structure is the central value proposition of my practice as an information architecture analyst. I've written about the importance of structure over the years and there are many reasons why I've stuck with that. For one, it's a familiar concept for people to grasp.

Information architects often rely heavily on correlations to architecture for the built environment. This connection has been a great way to get people to understand the work that we are doing. Structure, as a basic concept, offers a tangible mental image and implied function. For example, if we were in a building together, we could strip away the first couple of layers of the wall to see a

structural column. An engineer could point and say, "this is the beam that's holding the load of the floors above. If you remove this load-bearing beam, your building will collapse." Information architects have a comparable skill in the digital space: to engineer and consult on-site structure to mitigate collapse.

People will often ask, "What is the deliverable?" What's the artifact? What's the tangible thing that comes from the work that I do? In the past, there were sitemaps and wireframes. Others might say the artifact is the act of "making the complex clear," "consensus building," "facilitation," and it goes on and on. However, facilitation, nurturing alignment and making the complex clear are achieved in other fields as well. They are not exclusive to information architecture.

The answer that I give, that seems clear to me, is that we deliver comprehensive models. If you read "How to Make Sense of Any Mess", you'll notice how the book is all about types of models and visual representations, of things, that could be classified as models. Yes, we're inadvertently making the complex clear through the models that we use to express the interrelationships between things. The model *is* the deliverable. Clarity is a by-product.

Q: Why is it important to use models to express structure? And why is that unique to information architecture?

I gave a presentation in Boston a few years ago to explain how information architects use models as their primary tool to express site structure. I then expressed how "structure supports the design and sustainable use of an environment by providing resilience to informational forces." Hence, models are important because they are the embodiment of structure.

What information architects practice, at least in my practice, because I can speak for myself, is the wrangling of concepts with conceptual modeling. We don't just pull concepts out of people, out of business stakeholders, out of customers, and out of users for the sake of capturing them. We capture them so that we can document the formal relationships between things -- like intent, people, content, etc.

Now, modeling is not unique to information architecture. We simply have a different use for it. User interface and user experience designers, content strategists, program managers, product managers, and business analysts are all very comfortable modeling. They can effectively use models to articulate site structure to a certain level of complexity. It's like saying, I want to go outside and build a doghouse. It can be pretty straightforward to model a doghouse. You don't need a trained engineer. However, many teams don't realize until late in the process that instead of a doghouse, they are creating a user interface that's equivalent to a one-hundred-story skyscraper.

There is a different level of structural integrity and expertise that's needed to engineer the structure for a dog house versus a skyscraper. You have to ask different questions: Unlike a dog house, designing a skyscraper requires asking different questions like, "How will the local environmental conditions affect the structure? How should you engineer load-bearing columns to support 100 floors? What predictions can be made about the performance of the structure and the impact of continued use over time?

Similar to buildings, user interfaces and their respective human engagement have structure. As a result, information architects (or the individual responsible for user interface's structural integrity) should investigate questions, like: What factors of information load introduce risk to the performance of the user interface? What contextual and situational factors should we take into account as structure-based constraints? These and many other questions are ultimately meant to ensure the user interface performs as intended by removing the risks associated with structural failure.

With this lens, we can talk about the structure of a shopping cart as it relates to its respective ecosystem of potentially thousands of products and various user types. The structure of a user interface must counter environmental constraints and factors of direct user interaction that produce *load* (e.g. volume, volatility, information literacy, etc.) and exert *force* (e.g. infrastructure, context of use, culture, etc.). Anyone taking ownership of site structure should be considering this line of thinking.

Q: If this is how you approach a problem with clients, how did you first come up with this way of approaching a problem? What was your methodology?

I view information architecture as an information science. I am most interested in developing a theory of information that explores the qualitative (as in semantics, intent, behavior) nature of information that Shannon views as being "irrelevant to the engineering problem" of communication. As a result, I fall into the *philosophy of information* (PI) "camp" which is concerned with a wide array of questions concerning the nature of information.

In my research, I deduced a set of informational patterns that are essential to sustainable domain behavior. When a function is applied to this set, the outcome reveals a pattern of behavior that appears to offer a degree of invariable support, whereby if it were compromised, the domain would collapse. This behavior conceptually aligns with our idea of structure. Subsequently, if you correlate this theoretical outcome to the creation of application user interfaces, you'll notice how human concepts and their interrelationships are critically supportive of how we create application interfaces. Hence, based on my early epistemic stance on structure and a clear understanding of the other contributing disciplines, I'm confident that the structure of a user interface is instantiated through the modeling of its respective system of concepts.

I refer to the organizational function of creating and managing the system of conceptual models as UI structural engineering. The objective is to tend to the site structure and operationalize any related activities as it scales.

Q: If information architecture is all about structure, what does that mean for the practice?

Information architecture is not all about structure per se. For me, information architecture is about information theory and how I apply theory to solve information-based problems that benefit humanity and improve human-computer interaction. I'm confident that this also involves framing a professional practice with tangible artifacts. I think others have a similar use for their lens of information architecture.

With that said, information architects have an opportunity to position themselves as the "keepers of structure." We can assume ownership of this complexity to provide value to teams that seek user interface structural integrity by validating how everything connects and the implication of each connection to user interface behavior and user experience.

Back in the 1990s and early 2000s things were simpler. You could map out the pages and content relationships of a site with simple software. When we needed to see how things connected, process flows, sitemaps, and wireframes would suffice. That was then.

Today, we live in an already highly interactive and dynamic world that is teetering on the aspirations of the internet of things, personalization, and machine learning. However, there's anecdotal evidence that the structure of complex environments is simply not being addressed; far too many products and services do not meet our expectations and countless digital teams struggle with not having adequate structural inputs that would support digital design activities. And no matter how much data science, artificial intelligence, and deep learning you throw in, a general lack of structural knowledge in the industry is leading to unnecessary failure that has both human and financial consequences.

More of us need to be asking, "How do we create, assess, and manage user interface structure at scale with confidence?" What structural factors should be monitored? What structural insight do we offer digital teams, to business, and in some cases to society? The good thing is that we have an opportunity to meet this future need.

Q: Are we, as information architects, in a position to be able to ask some of the right questions?

While I think information architects are great at asking relevant questions, as a field, we have some important milestones to reach in order to get a chance to contribute in a meaningful way.

First, we need more depth in our approach to say, "Hey, digital and product teams out there, hire more information architects." They're going to ask, "What do you bring to the table? What is your process? What is your approach? What is your legacy? How can you quantify your value to us?" There's a great deal of market education that is needed, but I'm not convinced that we have a platform (pitch) upon which we can educate.

Secondly, our message can be drowned out by anything with "design" in the name. So, we have to convince an influential group of project gatekeepers that an information architect is necessary and what may appear to be a design problem, could actually be a structural issue built on poor conceptual assertions. Design can't fix a lot of the problems that we have with software. I deal with designers all the time. Designers want to solve problems. They don't have the natural desire or training to resolve systemic conceptual structures even though they are inadvertently expected to do so due to the expectation that they operate as master generalists of the user interface. It's an unfair and sometimes unrealistic burden to place on designers.

While information architects are in a position to ask the right questions, there is a line of other disciplines (product owners, designers, design thinkers, business stakeholders, technologists, etc.) waiting to give their input and we're in the back of that line! Getting to the front will likely be a matter of timing, readiness, and opportunity.

Q: What does our field need in order to advance?

It helps to have an advocate. We had the Information Architecture Institute (IAI) from 2002 to 2019. While the IAI had several programs that promoted knowledge sharing, apprenticeship, and community building, it never established a voice in the tech industry. The loss of the IAI creates a strategic communications gap for our field.

In essence, we need to reach a critical mass of consensus for expressing the benefits of information architecture as a work product and as a specialized area of practice. This could be facilitated by either establishing a new professional association, consortium, or open group of contributors who work together to promote guidelines, standards, and even ethics. I know, this is easier said than done and if there isn't enough interest in the industry, then an advocate is a moot point and all this remains academic.

I recognize that many in this field have become fatigued by defending the practice and how the approach to creating application interfaces are in constant flux. It seems like the kind of thinking that relates to information architecture gets relegated, pushed off, or is highly undervalued in environments of software and product agility.

The market understands software functionality. It understands the need for good interaction design and it's recently come to accept the importance of good user experience. But, the market has yet to appreciate how our system of concepts can be used to generate structure and ultimately improve software functionality, interaction design, user experience, and business outcomes.

We've lost many potentially great practitioners in this field because they couldn't find a solid professional footing with a viable career path. I think our time has yet to arrive. Until then, we need to continue to build a perspective on information architecture, mature our collective knowledge, and continue to bridge theory to practice.

We don't have to have all the answers and that's okay. I think getting companies to say, "I'm going to give this practice a shot because I think it will have an impact" is the opportunity we need to be ready for. And you know the saying: "practice makes perfect."