Operationalizing Ignorance: Post-Normal Architecture

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This inquiry looks to develop a "post-normal" discourse for architecture and explores how operationalizing ignorance can become a tool for architects to develop interventions better suited to dealing with the complexity and uncertainty of wicked problems. In these contexts, where uncertainties are sufficiently high, our limited knowledge is likely produce at best partial solutions. When unknowns exceed the knowns, different design strategies – ones more inclusive of a broader community of practice – are needed to characterize this post -normal type of problem and to design effective resolutions to it. The essay concludes by discussing two workshops hosted by University of Minnesota's School of Architecture that initiated this inquiry.

INTRODUCTION

This paper explores operationalizing ignorance as a strategy to engage in a "post-normal" discourse on architecture. The concept of post-normalism developed in the early 1990's (Funtowitz & Ravetz 1993) as an expansion to a scientific critique from the 1960's (Kuhn 1962) that characterized "normal" science as being overly constrained to studying problems with relatively low uncertainty and relatively narrow systems boundaries. This critique described the progression of normal scientific inquiry from the enlightenment onward as being focused on dividing systems into smaller and smaller increments (isolated from the at large system to minimize uncertainty) that are studied by more and more esoteric experts and specialists. Recognizing that normal science was uninterested or unable to establish inquiries within the levels of uncertainty attached to non-linear, far from equilibrium, systems (Kay 1999) and/or the uncertainties attached to the application of normal science toward human policy decisions (Funtowitz & Ravetz 1993), the concept of "post normal science" (PNS) was developed. PNS established an intellectual framework for developing scientific inquires that operated under the assumption of unpredictability, incomplete control, and a plurality of legitimate perspectives.

The problems that architects, landscape architects, and planners deal with are wicked (Rittel & Weber 1973) and exhibit the uncontrolled uncertainty and complexity that PNS was established to address. While architects often focus on designing artifacts, people do not experience artifacts. People experience artifacts within a context. Artifacts require integration with human agency, social structures and organizations to take on functionality. This context is shaped by more than direct human/technology interaction, it is shaped by the broader network of systems that influence human behavior toward technology - by regulation, user preference and practices, financial markets, economic standing, existing infrastructure (and access to it), production cycles, and maintenance, etc. (Geels, 2005).

In this context architecture is, and has always been, a post-normal project. Bruno Latour's argument in "We Have Never Been Modern" arrives at the same distinction though through a different classification (Latour, 1991). Whether post-normal or non-modern (Moe, 2013), architecture needs to re-establish its discourse and look for modes of practice that better operate within increased uncertainty, incomplete control, and greater pluralities of legitimate stakeholder perspectives.

OPERATIONALIZING IGNORANCE

The question is - how to do we operate on something that we do not know or that we know is uncertain? The criticism embedded in this panel discussion is that if we do not "know" something we either excise it from our system boundary, isolate it within our system boundary, or outsource it to an external consultancy. The option not generally considered is to try and understand it openly within our system boundary; which, we resist because we are constrained to operate within our pre-established silos or expertise. One is not to inquire where he or she is not an expert.

Knowing a socio-technical system fully and completely is impossible. In reality, when operating on this kind of system we hold only partial knowledge (some of which is likely inaccurate or misunderstood). We also know that there are parts of the system that are unknown to us (known unknowns), and we should acknowledge that we are ignorant to the rest of the system (unknown unknowns) – likely the vast majority of the system. In every case, we are infinitely more ignorant than we are knowledgeable – which in itself suggests a particular course of action (Vitiek & Jackson 2008).

Ignorance, as it is used here, is not a pejorative characterization. It is a pragmatic assessment of the real state of knowledge that we need to acknowledge if we are to effectively engage the real world. The use of term "ignorance" is not meant to critique the misapplication or omission of well-established facts, but rather to critique our diminished ability to characterize the complexity and uncertainty of complex systems in order to identify potentially consequential future states (Roy & Zeckhauser 2015). The goal is not to replace ignorance but to cope with it. To acknowledge that we should expect the

unexpected. While this sounds inefficient, this is only the case if our intension is to optimize the system for a particular fixed state. If our goal is effectiveness, then shifting material and energy exchanges that emerge out of the uncertain dynamics of the system become the critical feedback loops that we continuously study and observe when we acknowledge that we do not fully know them. There is such a thing as "usable ignorance" that informs how we operate on complex systems by refocusing our interventions toward feedback loops (Ravetz 1987) – dynamic change makers within a dynamic system – rather than optimized static system states.

Rather than turning away from uncertainty and questions that relate to the dynamic processes "of building," architects should develop practices to expand our communities of practice to co-develop questions and understandings that extend architecture beyond "the building." The philosopher Anna Peterson, in drawing a connection between ignorance and relational ethics states that, "In an ignorance-based model, we know longer assume that we can know what people will do and what will result from the actions of various parties, including ourselves. In the absence of such knowledge moral decisions and actions are grounded in relationships and in people's individual capacities to preserve in the face of uncertainty (Peterson, 2008)." The shift toward relational research and pedagogical models is critical for operating within extended communities of practice. The goal of collaboration is not simply to augment or buttress existing expert knowledge on a particular part of a system (i.e. architectural expertise), but to shift the way we think about the system in general. There is a difference between extracting information on a system from an extended community of practice and shifting one's understanding of a system by engaging with an extended community of practice (Freire 1970). This analogy extends to the difference between positioning oneself as an expert and positioning oneself as a non-expert collaborator. The expert extracts knowledge to validate his or her preexisting expertise; the non-expert shifts their expertise in response to another person's knowledge. Given the complexity and uncertainty of building ecologies, it seems prudent for the architect to position him/herself as a non-expert (Mans 2017) when positing "post-normal" questions for architecture.

POST NORMAL PEDAGOGIES

In these post-normal times, there is a need to shift pedagogy from rote memorization of known facts toward teaching students to articulate new and better questions and toward working with partners who can extend their knowledge. Humans peek in curiosity at age 4, and it is no coincidence that we start asking fewer and fewer questions as we enter school. Our education systems strip our student's curiosity to make them better repositories for facts. Educators acknowledge this as so, and accredit it to there not being enough time to ask new questions, blaming the amount of "knowledge" they are required to teach students surrounding preexisting questions. While, this is happening in our education systems, the business and entrepreneurial world is widely acknowledging that the most creative and successful leaders are not just experts – not just repositories of factual knowledge - they are expert questioners. We need the ability to ask the "right question" at the "right time" in order to adapt to a rapidly changing world and to identify new opportunities and possibilities. Our education systems on the other hand need us to score well on tests (Berger 2014). As this educational critique relates directly to architecture, three habits require breaking if we are to formalize practices and pedagogies more attuned to post-normal architecture.

EXPERT/NON-EXPERT

The first habit deals with expertise. Is being an expert effective in post-normal times? Architecture is an open system. It is a socio-technical system. While it engages the material and energetic flows that spatialize, heat, cool, support, clad, protect, shade, light and ventilate our environments – these design variables largely deal with technical side of the architectural equation. There is also a "socio" side of the equation, and this side exposes architecture to the economic, political, and ecological flows that more broadly shape our societies. This side of the equation diminishes the certainty with which limited expertise can adequately characterize the complexity of socio-technical systems. For an expert to more fully understand these systems they need to adopt an ignorance-based model of collaborative engagement – they need to become non-expert. The non-expert does not abandon expert knowledge, but has the mental capacity to temporarily deprioritizes it when listening to and shaping questions with an extended community of practice needed to more fully characterize the system in question (Mans, 2017).

The goal of becoming a non-expert is not to discount knowledge or to avoid rigorous inquiry, but rather to allow a mental repositioning that increases our nimbleness to move in and out of our areas of limited expertise. Experts are constrained to limited disciplinary silos and are conditioned through rigorous professional and/or academic training to think they already know what needs to be known. This sense of" knowing" makes the expert less curious and less open to new ideas that conflict with their limited knowledge and knowledge-based world views (Berger 2014). In contrast to this, the non-expert is a perpetual beginner; forever open to new possibilities and nimble enough to spot the critical questions that lead to innovative ideas (Suzuki 1970).

The expert is not only clouded by their expert bias, but like all of us, they are plagued by thinking they know more (often a lot more) than they actually do (Burton 2008). We exaggerate our knowledge as a way to compensate for our professional (expert) insecurities. Not knowing something, especially for professionals, raises questions of credibility. It puts us at risk for losing control of our professionally constrained domains.

SYSTEM BOUNDARIES

The second habit that needs breaking deals with the conceit that "a building" (noun), as opposed "building" (verb), is the primary concern of the discipline of architecture. While this reading fits well within the traditions of reductive inquiry, it does not account for the dynamic complexity that a post-normal reality exhibits. Reality show that we design in a context of open material and energetic exchange, which suggests that we should conceptually shape architecture based on dynamic flows rather than static forms. Modern design practices, however, do the opposite. They align with reductive methodologies that seek to dissect and isolate objects from the larger systems of which they are subcomponents (Mans & Yamada, 2015). These methods understand systems through analysis of their isolated parts and then reassemble them as discrete objects. The result, while often optimized, tends toward single state solutions. While we require practices that isolate complex systems, these practices should be temporary. Finite analysis, which isolates and abstracts variables of open systems to simplify and understand them, should reintroduce this simplified analysis back into the proper context. Not doing so results in a false understanding of the system in general (Moe, 2014).

There are scales that are more productive for "building" inquiry; habits of mind that address the socio-technical reality of architecture more directly. Material exchange affects economic, ecological, and cultural systems that span vast temporal and spatial scales. Architecture reciprocally connects sites of material extraction, production, and accumulation (Hutton, 2013). While accounting for these variables within our design models increases uncertainty, developing practices and pedagogies that make visible these systems - and the connections between them - increases our architectural agency. Extending our systems boundaries enables us to make building-scaled decisions based vast reciprocal material exchanges and energetic flows.

EXTENDED COMMUNITIES OF PRACTICE

The third habit that needs breaking deals with the nature of practice and the kinds of relationships we establish with our collaborators. Addressing the first two habits - (1) repositioning the architect as a non-expert and (2) extending system boundaries of buildings - suggests that we need to develop practices to operate within increased complexity and uncertainty. This applies to both our pedagogies and our practices; the labor needed to produce architectures responsive to the realities of a post-normal condition relies on an education system that trains students to be nimble and to ask questions. Characterizing this increased complexity and uncertainty requires us to extend the intellectual, geographical, and cultural diversity of our peer communities (Funtowitz & Ravetz 1993). Managing the communication, intellectual property, and knowledge of this extension is a significant design project in itself that if not carefully considered will further this increase complexity and uncertainty making the post-normal project intractable. When increasing the size of our practice communities we also need to establish governance structures that can effectively manage the communication and conflict resolution between distinct collaborators as well as ethically ensure that knowledge, resources, and values are equitable exchanged between all partners.

DISCURSIVE PROJECTS

The following projects explore ways of operationalizing this agenda. While the projects engaged through the University of Minnesota, they also have a life of their own outside of this institution. This is a characteristic of post-normal projects that results from the dismantling of the habits articulated above. The first project is an internal student workshop, the second project is a developing community/extended stakeholder consortium. These projects were developed over the past year in an effort to articulate a critical position on university collaboration with geographic and/or culturally defined communities as well as university engagement with professional communities.

(1) ARCHITECTURE AS CATALYST

Architecture as Catalyst is an annual week-long event intended to bring new ideas, conversations, and expertise to the University of Minnesota's School of Architecture. Guests from around the world are invited to run experimental workshops with graduate students and to give public lectures on their work. Each year, the week before spring break, first and second year graduate design students engage with the guests and host faculty in intensive five-day workshops, each focused around a unique set of ideas and techniques. The workshops leverage outside expertise to seed practices and conceptual ideas with students as they advance through the program. This process is top down and works from within the profession.

The 2018 Catalyst workshop flipped the script on this program, working from the bottom up directly with communities and engaged an array of multi-disciplinary partners to help facilitate the weeklong workshop experience. We wanted a workshop that developed design practices that are more people centric. Students, faculty and guest facilitators worked directly with people from diverse communities from around the world to develop design interventions that strengthen the interconnected socio-technical relationships that matter to them, the communities. The workshop had three objectives:

1. To characterize research questions or problem statements and to work with communities to understand the relational significance of individual problem variables.
2. To develop forms of critical representation that incorporate the full range of complexity embodied in the relationships we were exploring - students were tasked with not simply re-representing data that delineated a design solution, but to use drawings, models and other forms of representation to explore research questions and problems with community partners.

3. To develop speculative design ventures that provided interventions in response to the collective insights of the extended communities of practice that we were forming - these were collaborative projects and/or practices produced in direct respond to the challenges identified during the workshop.

This workshop sought to solve real problems affecting social, environmental, and economic conditions largely unmet by the profession, and to expose students to opportunities for design intervention that are not apparent in more conventional design practices or traditional design studios. The workshop was project forming; it established relationships between participants that extended beyond the weeklong workshop. We were careful not to characterize this effort as public interest design (an emerging sub discipline of architecture that claims particular expertise in working communities). This kind of classification pushes designers further down the professional rabbit hole and makes it more difficult to engage communities on non-expert footing. It was just design. Design engaged in creating a community of practice around a particular community and its issues.

(2) RISE (RESILIENCE THROUGH INNOVATION AND SUSTAINABLE ENERGY): THE GLOBAL CONVERGENCE LAB

At the invitation of the University of Puerto Rico's National Institute of Energy and Island Sustainability, the University of Minnesota designed and co-hosted a workshop to rethink collaboration models that will allow universities to more effectively participate in both global and local resiliency interventions. With the active participation of ninety representatives from twenty-six universities, from both Puerto Rico and the mainland, and fourteen from local and federal governments as well as community based organizations, the workshop developed work tables on issues such as the relationships between universities and communities, the macro political, economic and cultural context of resilience, the relationship between resilience and the built environment, and students' experiences in disasters. At the end of the workshop these conversations fed into a unified discussion on the governance structure of "RISE" at large as an interuniversity collaborative platform that could connect local issues into transferable conversations about global resiliency , set an ethical agenda for university, private sector, and government engagement with communities, and provide a knowledge/asset management system to match those in need with those who have resources to give. The workshop also included presentations by communities in Puerto Rico who narrated their first-hand experiences after the event and innovative local solutions to key infrastructural challenges.

This extended community of practice determined that:

1. The concept of RISE applies not only to PR but to all regions of the world that are experiencing the consequences of climate change. What started as an attempt to organize and coordinate research efforts and interventions in post Maria Puerto Rico, is applicable to other disaster areas and conditions in the sense that it provides a framework for university-community relations.
2. Universities are critical infrastructure because they are the greatest repositories of scientific knowledge about their local conditions and at the same time, they enjoy the necessary legitimacy to be centers of convergence for stakeholders. They provide the space for multi-sector dialogue that is essential to the resolution of wicked problems.
3. The role of universities in disasters need to go beyond humanitarian aid. Although very well intentioned members of academic communities are quick to respond with humanitarian and relief aid, universities need to insert themselves actively in the political and planning processes that guide reconstruction and mitigation of future disasters. They have both knowledge and legitimacy; therefore they have a responsibility to guide these processes with the best knowledge possible.
4. Universities need to accept and internalize their role as disaster respondents. This requires that they prepare for it with cultural relativist and basic disaster management training. After Maria, many of these universities received a crash education in community resilience. Instead of finding static communities, dependent and lacking initiative and/or organizational capacity, they found examples of highly resilient communities, that were well organized and self-reliant. This was not perhaps the logical expectation after such a catastrophic event, however after years of neglect from local and state governmental institutions and federal institutions, communities in Puerto Rico have learned to do things "despite of," instead of being "empowered by." Therefore, universities should not expect defenseless communities and powerless victims that will passively take what they are given. They will encounter assertive members of pre-existing societies, with their own set of values, beliefs, knowledge norms and institutions that deserve full respect. At the same time, they must recognize that the communities they are inserting themselves into have just experienced very traumatic events. That brings a whole new set of complexities for interactions.
5. Puerto Rican academic institutions, especially the public university, were ill prepared to serve as a convener or facilitator for these many intense, well intentioned and multiple efforts. In the UPR system, INESI could jump to the task due to its heterarquical structure but even its existence was a triumph due to the institution's highly centralized, heavily bureaucratic, and highly partisan structure. That means that universities have the responsibility to prepare for disasters in their own back yards by identifying their resources beforehand and creating internal networks of communities of practice around issues of disaster, resilience, sustainability, etc.

Taking on global-scaled resiliency issues requires a different scale of interuniversity coordination. Each community and university has a responsibility to deal with its own particular local issues; but still, we share the need to develop a more productive relationship that can incorporate a wider range of interdisciplinary partners to shape a different kind of project. Projects that are more effective, more equitable, and more transferable to other communities. This year a number of universities have focused on collaborate with communities in Puerto Rico following Hurricane Maria. Next year this interest may shift. Numerous types of environment events are becoming more intense and more frequent. Hurricanes, tornados, wildfires, atmospheric rivers, and/or droughts could make nearly any community, in nearly any geography, the center of this focus overnight. Compounding these events are other human constructed issues such as mass migration, rapid urbanization, economic collapse, and/or public health outbreaks that require a similar kind of convergent effort from universities to confront. The need for universities to engage more effectively, equitably, and in coordination with one another, increases with the increase in severity and frequency of these events. The issues listed above are going to test the capacities of communities and governments to both plan and responded effectively. Will universities adapt to help fill this gap?

CONCLUSION

This inquiry explores how a "post-normal" framework cab enable architects to operationalize ignorance as a tool for designing increasingly complex socio-technical systems that require extended communities of practice to characterize. While the post-normal descriptor elicits an image of "the strange," the complexity and uncertainty that it embodies is closer to reality than the more "normal" methods typically adopted by scientific and/or architectural inquiry. Architecture needs to re-establish its discourse and look for modes of practice that better operate within increased uncertainty, incomplete control, and greater pluralities of legitimate stakeholder perspectives. Architectural expertise on its own is not enough, we need nimble mental frameworks that allow us to step outside our expertise and ask different and more difficult questions; questions not biased toward a building as an answer but questions that realistically engage in the energetic and material flows of buildings in order to tap larger and more power systems. The descriptive projects outlined above test several recently developed design pedagogies, relationship design models, governance structures and community design collaborations to exploring the role of universities in general, and architectural programs at universities in particular, in shaping extended communities of practice that can effectively operate in a "post-normal" context.

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