Principles for Integration
Learning from Public Interest Design

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Rebuild Sudan

We cannot solve problems by using the same kind of thinking we used when we created them.

—Albert Einstein

As the mementoes of the assembly line approach the past, the last century's building portfolio epitomizes the industrialized era in which it was produced. Isolating energy systems and siloing disciplines from each other for efficiency's sake has resulted in a collection of buildings that are anything but efficient.[1] Existing buildings use more than 41% of the United States' energy[2] and are often full of inefficient energy systems, generate unnecessary waste, and do not promote occupant health. Even the American Institute of Architects recognizes their conventional terminology[3] to describe the building process creates legal and procedural barriers that prevent project teams from working in a more integrative and collaborative manner.[4] "The biggest single change that needs to be made in the building profession is not the invention of a new technology, but a change in the mindset"[5] of designers and engineers to develop a framework for integrative building design and construction.

To integrate is "to make a new whole by bringing together many separated parts," and originates from the Latin word, *integrat*, meaning "made whole."[6] The more complex the conflict is between the parts, the more difficult the process of reconciliation or integration is for the new whole. For this reason and especially in the building industry, integration is easier and more often practiced *within* systems, but not *between* them. Such siloed optimization tends to undermine the entire system as "you can actually make a system less efficient, by not properly linking up those components…if they're not designed to work with one another, they'll tend to work against one another."[7]

While the concept of integration has been spoken about for years, as each discipline works to evolve its own procedures and knowledge, the principles and theoretical framework to practice the process of integration have not yet been established.[8] In the profit-driven, litigation-saturated, and individualized building fields, new theories and approaches to building design are not easily implemented. Evidence strongly shows, however, that a more integrative method of practice is emerging from the field of "Public Interest Design." Learning from the not-for-profit, public-interest, and humanitarian projects of the last 40 years can help us rethink our traditional approach of building to inform a new interdisciplinary model that not only responds to the challenges of today, but also prepares us to better address the complexities of problems in the future. This article seeks to propose and examine four core principles of an integrative design process as evidenced by public interest work.

Purpose
Alignment around the "Why," Not the "What"

Architecture is not primarily for architects, nor are buildings built for builders; our projects must first and foremost be centered on serving the needs and purposes of our clients. The ultimate success of a project has its foundation in alignment around the project's purpose. The purpose for a project, in the eyes of the client, is the underlying reason for a building, not necessarily the building itself. This purpose serves as the project's "thesis statement," and it is paramount that the design and construction teams align themselves around this objective.

Integrative project teams and clients must shift their initial focus from the "what" of the building's form and function to the "why" behind the need for a building in the first place. The following is an account of this shift of thinking by the 7group in a discussion with a client for an international corporate headquarters:

"Why do you need this building?" the designer asked. "Trust me, I know this seems obvious."

"We need more space," the Vice President replied.

"Why do you need more space?" he prompted again.

"To house our growing workforce."

PURPOSE
Alignment around the "WHY" not the "WHAT"

+

CONTEXT
No part or system is in Isolation

+

COLLABORATION
Shifting from Multi–Disciplinary to Interdisciplinary

+

ADAPTATION
Continuous Development

"Why do you need to house the workforce?" he asked to the visibly agitated Vice President.

"To achieve a higher level of effective communication and morale."

"Why will they interact better if you build the design concept that's already up there on the wall?" the team asked one final time, and then a silence fell across the room.

After the executive had thought for a while, he suddenly exclaimed those "why" questions just saved him $30 million. When asked to explain, he said the reflection caused him to question why his employees' interactions would be enhanced because of the proposed design concept, only to realize half of them would reap no benefit at all.[9]

Public Interest Designers have been practicing this purpose-driven ap-proach for decades[10] through what has been called Human Centered Design. Recently, this process has been captured in a comprehensive document by IDEO in their Human Centered Design Toolkit.[11] Created to help organizations better connect with the people they serve, primar-ily in the developing world, many of these practices can be applied to any design context. This process funda-mentally starts with an examination of the people for whom the design is intended by understanding their needs, visions, and behaviors. The first chapter entitled "Hear," guides this initial step by asking teams to identify a concise design challenge, which is to become the foundation for the entire process. It maps out a suc-cinct process by which to determine a project's purpose:

1. Work with leadership to identify a list of criteria for the challenge.
2. With the leadership and design team, make a list of challenges you are facing.
3. Reframe those challenges from the [occupants'] point of view and the broader context.
4. Vote or select the top two or three challenges based on your criteria.
5. Narrow to one challenge with input from key stakeholders.
6. Write a succinct, one sentence [purpose] to guide the design team.

Many firms and projects[12] do not discuss project values or intentions with the clients or they do not do so early enough in the building pro-cess to impact the outcome of their own established designs or strate-gies. Learning from public interest design's human-centered approach and purpose-finding process will al-low integrative project teams time to understand the "why" behind the project instead of focusing so quickly on the "what" of the building's form or function.

Contextual
No Part in Isolation

Winston Churchill once said, "We shape our buildings; thereafter they shape us."[13] We also shape the neigh-borhood, local culture, and global environment where our projects are sited. Understanding the larger nested systems beyond a project's site (wa-tershed, infrastructure, community, energy sources, larger regions, etc.), helps guide an appropriate project design to work in harmony, not oppo-sition, to those systems. While quan-titative research facilitates a breadth of measurable information, a shift towards qualitative research should also be encouraged to understand a project's context. Qualitative data provides a depth of understanding and a respect for the uniqueness of each place, allowing integrative teams to see their building as a living part that influences and is influenced by larger nested systems.
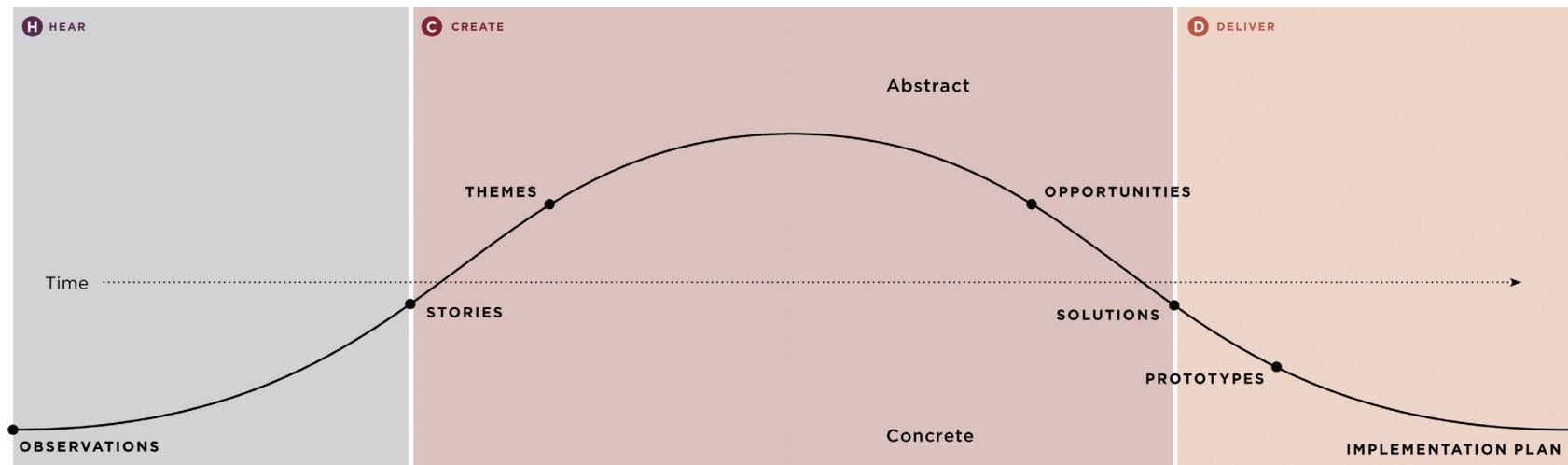
Human Centered Design Process according to IDEO

Public Interest Design projects exhibit this principle well in master planning opportunities such as the 100-acre "sustainable community" plan for a Haitian town just north of Port-au-Prince. Looking to address the housing needs of the 20,000 earthquake refugees now living in their land, a Haitian NGO invited Engineering Ministries International (eMi) to design a master plan for their site. Though their immediate need was for housing, "a large cry for Haiti's rebuilding process is jobs," said project leader, Rex Barber.[14] Instead of seeing job creation as someone else's responsibility, the design team worked with the NGO and the local community to approach the plan holistically. By understanding the environmental issues at play, they discovered assets the community had in order to rebuild itself economically. The site's marshy land is ideal for fish farming and rice type plants, so eMi also worked with the community to design a fishery with an easily maintainable irrigation system. They also developed plans for sorghum to be grown and processed for biofuels and set aside land where farms could grow vegetable products to sell at an agricultural distribution center or local market. Additionally, a sports facility, a retreat center, schools, and a church, which serve as the hub of the community, were incorporated into this holistic design. Without this contextual approach, eMi may have provided a design to house the displaced, but they would be left jobless and without a sustainable way of providing for their own futures.

With a contextual understanding, teams can create projects informed by the values of community members, knowledge of local construction methods and practices, an understanding of the economic opportunities, and inspiration from nature herself.[15] Projects focused on an integrative process aim to make a minimal environmental impact. They naturally fit into the cultural landscape because they have significant input by people who are committed to a particular area and rooted in knowledge grown from that place.[16]

Collaborative
Shifting from Multi-Disciplinary to Interdisciplinary

Current building practices have, for the most part, remained multidisciplinary. Professionals have been trained to optimize their systems using industry rules of thumb and designed separate from other building systems. Buildings, therefore, contain redundancy after redundancy because the entire project cannot be understood as a whole from any one discipline; the "many minds participating in the process, function as disparate bodies of intelligence rather than as a coherent, organized force."[17] Many studies have found that teams that lack shared understanding cause unnecessary iterative loops in the building process,[18] and that the highest quality products are created by teams with an increase in shared understanding.[19] Additionally, participation by the clients in collaboration with the experts has been seen as a critical missing link in the improvement of neighborhoods and communities. Most team members have not been trained in how to share understanding with related disciplines, much less with a client or community.

If a multidisciplinary approach offers a variety of perspectives on a problem, then collaboration implies a commitment to the hard work it takes to integrate such varied perspectives into a comprehensive solution. This type of integration requires a deeply participatory process that seeks to reconcile conflicts between the perspectives until the sum is larger than its individual parts.[20] Public interest projects have been practicing a collaborative design process since the early 1960s during the civil rights movement, seeking to democratize design and use it as a vehicle for resolving urgent social issues.[21] In these community-oriented projects, teams seek to engage stakeholders and community members in the design process to ensure the project's outcome meets their desired needs.[22] The community of Bayview on Virginia's Eastern Shore, is a national model for this collaborative approach.

Isolated and stricken by poverty, with only six toilets for the town's 52 houses, the community built a coalition to ward off the outside political proposal of a maximum-security prison. They then used their momentum and collective voice to create an interdisciplinary team of experts[23] lead by designer Maurice Cox. What began as a small attempt to clean up the streets and plant flowers catalyzed larger redevelopment steps. The community frequently gathered together over cookouts to discuss issues and develop design options. "For me," reflected Maurice Cox, "the most interesting part of the process was the idea of using the design process as a way to help people make decisions... [and when] a decision would be made, we, the designers, would live by it."[24] Through this collaborative and participatory process, small shacks were
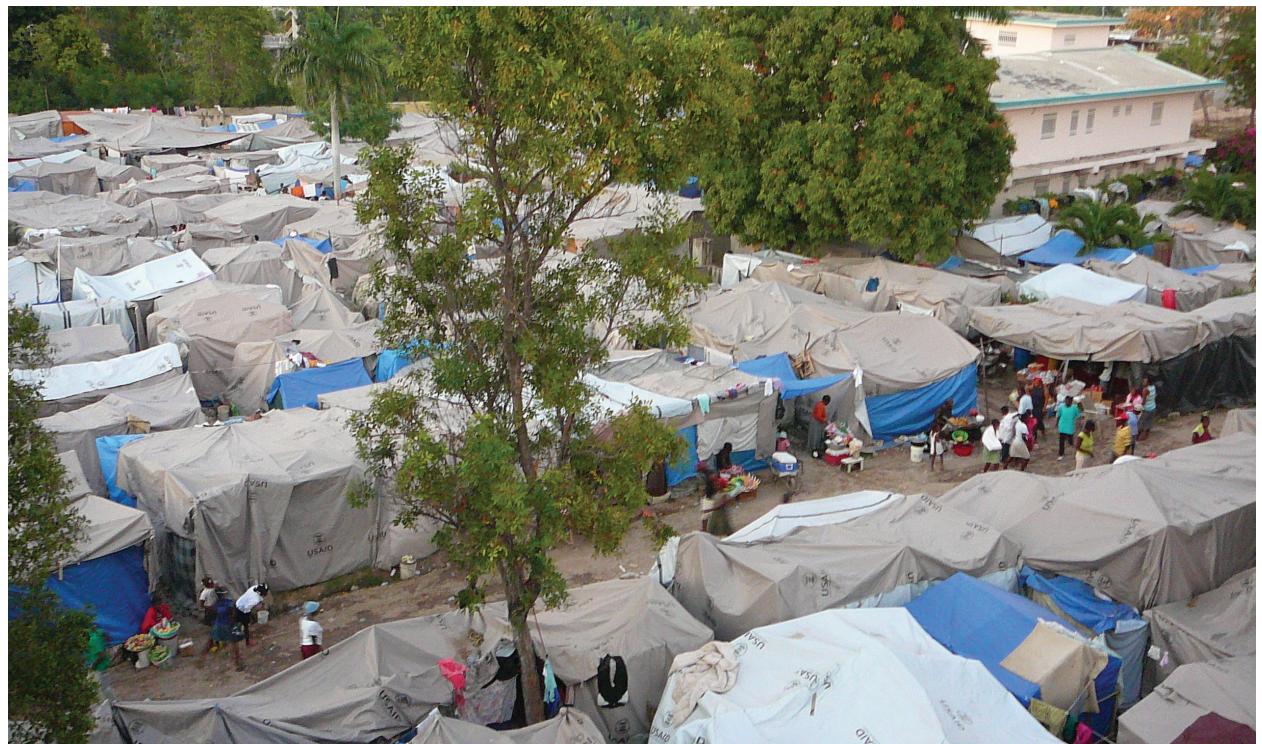
View of refugee tents

replaced by affordable and dignified neighborhoods, community gardens, and a stronger economy.

Partnerships and new technologies might attempt to facilitate collaboration, but they do not create it; a shift in the mindset is required to realize the synergistic value generated when things are done collaboratively. Recognizing that everyone has something to contribute to the design of a project, collaborative teams can often accomplish more together than any one individual can on their own.

Adaptive
Continuous Development

Core to integrative design in the intrinsic ability of a team to evolve the project and design process as they receive new information, question preconceptions, and learn from their failures. Through continuous analysis, teams question assumptions and biases so that they may discover better solutions to the project's purpose, instead of implementing

rigid solutions without a thorough investigation of the impact those predetermined solutions can have on a building and its surrounding context.[25] An integrative building can only emerge if the project team is willing to explore, test, and refine its project solutions; repeating the process again and again until a specific result is achieved.

Learning from mistakes and the ability to adapt isn't unique to public interest projects alone. But these projects often have more time than money in their organizational accounts and therefore have been able to implement an adaptable approach more readily than traditional processes. From my own experience on a half dozen projects, I think there is also an openness to learn and the humility to ask questions, which helps to drive the evolution of the project through each iteration to a more optimized solution.

In 2009, I co-led a team of 11 designers and consultants into what is now

South Sudan to design a prototype school[26] for future replication by indigenous communities. During our trip, we collaboratively applied local construction knowledge to create a design that addressed the context and purpose of the project. After we returned, we reflected on the initial design only to realize our approach would not be economically feasible to build or replicate. Though slab on grade foundation is the most common foundation type in nearby cities, we would need more than 1,200 tons (120 truck loads) of rock and sand to elevate our building enough to avoid flooding from the Nile River, and we would have to ship it as far as 12 hours away and cost up to $2,000 a load to transport.

Understanding we would need to adapt for our project to survive, we discovered a simple, but often under-utilized technology, helical piers, which not only minimized materials for the entire structure, but also elevated the building. During the implementation of this project,

we encountered many problems, including difficulty installing the piers, a contractor change, the loss of team members due to local tribal fighting, and a high rate of inflation. All of these factors threatened to end the project, but instead, we have evolved our process and product for the better as we remain adaptive to the circumstances.

The ability to question previously established assumptions is often uncomfortable, but challenging biases can lead to better solutions environmentally, functionally, aesthetically, and economically. Just as a project team must learn to adapt, so too must each individual team member. Recognizing our own character development and ability to work with others affects the projects in which we participate. Adaptive team members often bring with them an openness to learn and humility to admit mistakes, thus making them powerful contributors to the integrative process.

Jalle School, South Sudan

Recognizing Future Applications

Buildings are one of the most permanent things one generation leaves for the next. This post-industrial society has inherited not only a deteriorating building portfolio, but also a deteriorated building process. If the field of architecture is to evolve, design professionals must learn to *build differently*. But before they can *build differently*, they must learn to *think differently*. It is time for the building industry to recognize the potential of an integrative movement and begin establishing it as a framework for design.

The building industry must embrace a focus on purpose, with an emphasis not on high-quality building for the wealthy few, but on best meeting the needs those buildings are meant to serve for the majority of the population. Public interest projects should embrace their proximity to these principles and set an example of integrative design that the rest of the industry can follow. Project teams must let a building's context inform its design, creating improvements that will be readily grafted into the nested systems in which it will exist. Building design and construction methods must foster collaboration within teams, putting different minds together to form elegant, interconnected solutions to the problems a project will face. Lastly, the design and construction industry must embrace an adaptive approach, being open to

the questions that challenge a design

until it can be fully refined.

The principles established in this article should be investigated further, tried across all project types, and developed into a more robust architectural theory of integration. Only through the implementation of an integrative framework can the industry shift its thinking from the industrial past and design buildings that will create a new legacy for generations to come.

Notes

1. 7group & Bill Reed, *The Integrative Design Guide to Green Building* (Hoboken, N.J.: Wiley, 2009), 9-12

2. Department of Energy, Buildings Energy Data Book (2011).

3. The AIA has created an industry standard workflow process around the main categories of a project: schematic design, design development, and construction drawings, and construction administration.

4. IDP Definition Task Group, American Institute of Architects California Council, *Integrated Project Deliver: A Working Definition Version 1*. (Sacramento, CA: AIA California Council, 2007), 4.

5. Jason F. McLennan, *The Philosophy of Sustainable Design* (Kansas City: Ecotone LLC, 2004), 88.

6. "Integrate," Oxford Dictionaries, http://oxforddictionaries.com/view/entry/m_en_us1258459# m_en_us1258459 (accessed April 9, 2011).

7. Paul Hawken, Amory Lovins, L. Hunter Lovins, *Natural Capitalism* (New York: Back Bay Books, 1999), 117.

8. 7group and Bill Reed, *The Integrative Design Guide to Green Building* (Hoboken, NJ: John Wiley & Sons, Inc), 19; Whole Building Design Guide: A Program of the National Institute of Building Sciences, http://www.wbdg.org/; The Living Principles for Design, http://www.livingprinciples.org/.

9. 7group and Bill Reed, *The Integrative Design Guide to Green Building* (Hoboken, N.J.: Wiley, 2009), 61.

10. The Institute for Human Centered Design was founded in 1978 in Boston to advance the role of design in expanding opportunity and enhancing experience for people of all ages and abilities through excellence in design. See http://humancentereddesign.org/.

11. IDEO teamed up with ICRW and Heifer International for this project funded by IDE and the Bill & Malinda Gates Foundation. Download the toolkit and join the new network at: http://www.hcdconnect.org/.

12. Anders Christoffersen and Stxephen Emmitt. "Exploring the Value Universe: A Values-Based Approach to Design Management," in *Architectural Management: International Research and Practice*, ed. Stephen Emmitt, Matthijs Prins, and Ad den Otter (Chichester, UK: Wiley-Blackwell, 2009); David Maister, Managing the Professional Service Firm (New York: Free Press, 1997).

13. House of Commons on October 28, 1944

14. Rex Barber, interview by author, Colorado Springs, CA, March 3, 2011.

15. The Living Principles for Design framework is a catalyst for driving positive cultural change. It distills the four streams of sustainability – environment, people, economy, and culture – into a roadmap that is understandable, integrated, and most importantly, actionable. See more information at http://www.livingprinciples.org/.

16. Sim Van der Ryn, Ecological Design (Washington D.C.: Island Press, 1996), 65.

17. 7group and Bill Reed, *The Integrative Design Guide to Green Building* (Hoboken, N.J.: Wiley, 2009), 10.

18. Maaike Kleinsmann and Rianne Valkenburg, "Barriers and Enablers for Creating Shared Understanding in Co-design Projects," in *Design Studies* 29 (2008), 371; A Valkenburg and K Dorst, "The Reflective Practice of Design Teams," in *Design Studies* 19 (1980).

19. Maaike Kleinsmann, Jan Buijs, and Rianne Valkenburg, "Understanding the Complexity of Knowledge Integration in Collaborative New Product Development Teams: A Case Study," *Journal of Engineering and Technology Management* 27 (2010), 22.

20. Allen F. Repko, *Interdisciplinary Research*, (Los Angeles: Sage, 2008), 6.

21. Association for Community Design, http://www.communitydesign.org/.

22. Henry Sanoff, Community Participation Methods in Design and Planning (New York: John Wiley & Sons, 2000).

23. Nature Conservancy, EPA, National Association for the Advancement of Colored People, Local leadership in Northampton County, Alembic Community Development, US Department of Agriculture's Rural Development Loan Program, and the Citizens for a Better Eastern Shore

24. Interview with Maurice D. Cox: Bayview Rural Village in *Design Like You Give a Damn* (New York: Metropolis Books, 2006), 156-163.

25. 7group and Bill Reed, *The Integrative Design Guide to Green Building* (Hoboken, N.J.: Wiley, 2009), 204.

26. For more information, see rebuildsudan.org.

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Helical pier installation