

Green Design and Organizational Sustainability

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In the early 1900s, naturalist John Muir commented, "When you tug at a single thing in nature, you soon find it attached to the rest of the world." No doubt he learned this through his close observation of the natural world. But a hundred years later our connection to the natural world is indirect and blurred. Between 80 to 90% of the typical day of a North American is spent within the 'built' environment. Our 'natural' world has become an intoxicating mixture of reality TV, videogames, and email messages; and these disconnect us from directly understanding the realities that impact our every thought, word and deed.

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For too long the natural world and the social world have been viewed as separate "problems" looking for separate "solutions," like growing tomatoes is one problem and tilling soil is another. While different, the two have a distinct relationship.

Let's bring this illustration a little closer to the business world: The goal of any building project is to develop a stable environment that will sustain an organization. Dare I call it an ecosystem? If the end result is an environment that causes either physical or social dysfunction (for reasons endemic to the acquisition and application of materials or of process and policies within the organization), then the goal has not been achieved.

Someone once quipped "I don't care if Mies Vander Roe is spinning in his grave, I'm comfy in this rocking chair". Clearly this guy didn't buy into the modernist appeal of the building design he was working in. For him, the building goal failed. Comfort was central to organizational sustainability.

Each of us brings to the "organizational table" a multitude of complex issues. These perceptions and physical connections are critical to human performance, and they are embedded in the natural world around us.

Following are nine aspects of our natural and social environments that shape us:

- The materials that we come into contact with each day that comprise the built Environment

What is the level of toxicity in item being considered? How much "embodied energy" is required for the production of it, and what were the environmental considerations from the gathering of raw materials through the manufacturing if it?

- The quality of the air we breathe and how we perceive that air

The air we breathe is composed of physical and perceptual attributes that directly impact our health. In fact, thermal comfort

and air quality are among the top items noted by occupants in several studies focused on job satisfaction. They are also the source of half the annual energy budget of a building. Unfortunately indoor air quality is traditionally a "problem driven" issue. Little attention or legislation is given until after chronic conditions have arisen. Inadequate ventilation – insufficient outside air – is the essence of the problem, characterized by the following attributes:

- Internal VOC's
- Outdoor pollutants trapped inside
- Mold or microorganisms that grow and disperse through HVAC systems

- The light that lets us see and what we see

The environmental focus on lighting has been toward reduced energy consumption. Environmental designers have encouraged the use of more daylight to reduce energy costs and create a more natural atmosphere.

Access to natural daylight has been studied by a vast number of researchers ranging from medical interest in the affect of daylight deprivation in submariners (circadian rhythm) , to the sales volumes in retail stores with natural light vs. artificial light. The overwhelming body of evidence is in favor of the relationship that humans have with natural light

-Things we use and their life cycles

Whether you retrofit an existing building or design a new facility, sustainability is a long-term vision. The majority of investors in the US are looking for a payback in ten years versus a payback of 50 years in Western Europe. We must begin the process of thinking and purchasing on a scale much broader than current scope allows. Following are some considerations in analyzing life -cycle cost as opposed to short duration cost:

- **Durability** – can the item being purchased

be adapted to changing business conditions?

- **Product example** – Vinyl flooring vs. Linoleum; environmental concerns aside, consider the 6-year cost/maintenance consideration of these two products.
- **Furnishings selections** – adaptability, investment, supportive of changing organizational alignments
- **Data components** – North American companies spend \$16 billion dollars annually on recabling for moves, adds, and changes.
- **Churn** - the silent expense. Consider that there is a 25-30% annual reconfiguration of commercial office space in the US

- Design for Environment

What does an artifact become after its useful or "valid" life comes to an end? The process required to allow it to become something else is the essence of "cradle to cradle" design and is part of the intrinsic understanding of the item as a whole. Components of that understanding include:

- Reuse or refurbishment of materials.
- Material selection considers toxicity.
- A minimum of materials are used to facilitate disassembly.
- Materials are identified for potential recycling or reuse.
- Disassembly aids are designed into the material (fracture points, fastening vs. bonding).
- Is the item designed for replacement of obsolete parts vs. replacing the whole.

-The energy we use

The energy efficiency of a building, inclusive of mechanical and electrical systems, has proven to provide one of the most compelling financial models for introducing change within building/design considerations. Cost savings gained by reducing the use of natural resources and to a lesser degree, savings gained through reuse (or avoidance) of materials, has captured the attention of fiscal decision-makers and has been one

area that "green" and "non-green" proponents find agreement. Clearly defined and achieved performance targets in building efficiencies have been noted and pervade the press. Sustenance is far more than simple conservation of limited resources, its success depends critically upon its ability to be substituted with renewable resources.

- Our personal psycho-social attributes

We require motivation and meaning in the work we do. We need to find inspiration and stimulation to spur motivation. We know that health is central to our ability to cognitively function at our fullest capacity. We require a degree of insulation within our work environments to be able to filter relevant and irrelevant stimuli. We need interaction - in fact, this is why we have buildings for business transactions in the first place! We need to be able to externalize our ideas - they may seem great to us individually, but they do no good until they are shared with others. Lastly, we need space to consistently "off-load" or embed the things that we cannot keep in the forefront of our minds. Our living/working spaces are rich repositories of information cues that are central to cognition.

The value of these dimensions are the underpinning of sustainability within an organization and are demonstrated through a reduction in illnesses, reduction of company (direct) costs by reducing worker's compensation costs (estimated at \$15 to \$20 billion dollars per year) , improved employee effectiveness, commitment, and improved attraction and retention.

An organizational system is balanced/ sustained through the interaction of these social and physical conditions. Design impacts these conditions in the following ways:

Social construct

- Windows increase social desirability of a

space. ("Transitory window gazing" allows for the seeking of a break from attentive listening through "soft attention" as opposed to "fixed focus activity" such as doodling from which is more difficult to refocus.)

- Well lit rooms with high ceilings and sociopetal (inward facing) arrangements.
- Furnishings that provide no status cues within groups
- Since an estimated 60% of learning occurs in informal situations – design for "social channeling"
- Allow for self-organization

Workstation design

- We feel more comfortable with a wall behind us or to one side.
- A blank wall should be no closer than 8 feet in front of us.
- Work spaces where we spend all day should be at least 60 square feet in area.
- Each work space should be 50 to 75% enclosed by walls or windows.
- Every work space should have a view to the outside. (Exterior views have been proven to decrease occupational and medical stress and increase creative performance.)
- No other person should work closer than within 8 feet of our work space.
- We should not be able to hear noises very different from the kind of noise we make from our work space (relates to acoustic disturbances and their impacts on concentration).
- Work spaces should allow us to face in different directions.
- No one should be sitting directly opposite of us and facing us in our work space.

- Our social systems

Determining organizational composition is a complex process. Methods range from written surveys, oral interviews of individuals, focus groups and activities to observations or ethnographic studies. The Gallup organization relies on a 12-question survey

from which they can determine the level of employee engagement – "engaged, not engaged, or disengaged" – which they quantify to determine overall organizational health.

Another example of a survey that aims to determine organization type is one administered by Deshpande, Farley and Webster. In this survey, organizations are characterized as one of four types:

1. **Market Culture**– emphasis on competitiveness and goal achievement
2. **Adhocracy**– emphasis on entrepreneurship and creativity
3. **Clan Culture**– emphasis on teamwork and cooperation
4. **Hierarchical Culture**– one that stresses order and regulations

The implications of this information may manifest themselves in interior designs that fit the culture.

- How we adapt or change over time/ Managing change and expectations over time

Capitalizing on the strengths of individuals is the key to instilling the same diversity that allows the model in nature to flourish. These strengths promote organizational sustainability. The 1927 Western Electric "Hawthorne" studies pointed out that workplaces are social environments and within them people are motivated by more than merely economic self-interest. These social systems are made up of interdependent parts. Franklin Becker uses the term "organizational ecology" to describe the workplace as a designed strategy of physical settings and social process that are managed through time. Nature is a system composed of interdependent parts. "Organizational ecologies" are complimentary to that natural system, borrowing from John Muir in his thoughts on nature, "When one tugs at a single thing in nature, he finds it attached to the whole world."

These nine form the basis for a new view of sustainability. They are central to how we perceive space and situations both consciously and unconsciously. They determine how we respond in social situations. How we respond in social situations determines what we get done. What we get done determines if the organization remains viable. If we perceive an environment to be threatening (too hot, too cold, too dark, poor air/flow/humidity, color, physically discomforting, social design incompatible with personality, etc.) we're likely to respond in a much more hostile manner. If the environment is impacting our physical/mental health, our ability to concentrate is reduced, our organizational commitment is reduced, and our capacity to creatively solve problems is also reduced. If the degradation of natural ecosystems impacts our prospect for a future, our ability to successfully support human endeavor will ultimately fail.

Bottom line: there is an inextricable relationship between humans and the natural environment. Henry David Thoreau asked, "What's the sense of building a house if I don't have a tolerable planet on which to put it?"

Natural ecosystems, social ecosystems, and the future prospect of both are intertwined in an ever so delicate dance. If we as designers and architects, who are uniquely positioned to impact both spheres, allow either partner to step on the toes of the other, the damage caused to the dancers may be far greater than imagined. Painfully we will come to the realization that "When we tug at a single thing in nature, we soon find it attached to the rest of the world."

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