ABSTRACT
This paper, illustrated with built examples, uses Integral Theory to map four distinct yet ever-present perspectives on Sustainable Design, each with fundamentally different methods, criteria for value, and definitions of good form. The perspectives are articulated by intersecting two primary distinctions: 1) subjective (interior) vs. objective (exterior) ways of knowing and 2) perspectives of individuals (parts, persons, members) vs. collective systems ( wholes, networks, societies). This yields four different viewpoints: Behaviours (singular-objective) [the “IT” prospects], Systems (collective/inter-objective) [the “ITS” prospects], Experiences (singular-subjective) [the “I” prospects], and Cultures (collective/inter-subjective) [the “We” prospects]. From each of these varied perspectives on design, the nature of Sustainable Design and that of Nature itself show up quite differently. Yet many Sustainable Design approaches are primarily grounded in the singular-objective Behaviours Perspective. The expanded multi-perspectival view presented here can enable designers to more comprehensively address the complexity of today’s ecological challenges by including the individual, cultural and social dimensions that contribute to the creation of a sustainable world.

Keywords: integral theory, performance, systems, cultures, experiences, sustainability

1 INTRODUCTION
Perhaps because of the dominance of empirically-based sustainability perspectives, and the culturally predisposed listening that many of us have for it, designers commonly equate sustainability with technology and sustainable technology with quantifiable energy efficiency or its visible hardware, such as photovoltaic collectors. While Sustainable Design is increasingly associated with performance measures, the wider profession is, on the other hand, increasingly ideologically pluralistic. Despite this pluralism, the design fields, and Sustainable Design in particular, seem to have no collective framework for navigating and transcending the fragmentation that entrenches both academia and practice.

Subjective perspectives are missing from most Sustainable Design thinking. As an example, in the US, there are no LEED credits for creating experiences of beauty, none for creating or fitting to ecological order and none for placing people into rich symbolic relationships with Nature. Quality and subjectivity do not appear on this horizon. This is not to argue for devaluing this approach: the technological view of Sustainable Design has done great things for our awareness of the limits of resources and environmental sinks—and the relationships of building design to these.

Similarly, environmentalism based on scientific rationalism has not been very effective. The message goes something like this: ‘Look, we have the facts … the sky is falling, we’re running out of everything you need, the climate is going crazy and Nobel laureate Al Gore (former US Vice-President) has pictures of the polar caps that should scare the pants off of all of us.’ Well, if that does not work to get our collective profession in action, statistics about the contribution of buildings to landfill waste, water consumption and CO2 production probably will not work too well with a broad audience either—that is, when that’s the only argument we are making. To address these issues, this paper expands on the
theoretical views introduced in *Integral Sustainable Design* [1, 2] which was the first work to apply Integral Theory [3, 4] to design, and in particular to the field of Sustainable Design.

2 INTEGRAL THEORY’S FOUR PERSPECTIVES

*Integral Theory* is an emerging theory base that the author has found to be helpful in teaching and thinking about the complexity of Sustainable Design. An integral theory begins with the assumption that everyone is right—at least partially—and seeks to fashion an intellectual framework that both transcends and includes differences. An integrally-informed approach to Sustainable Design (or anything else) challenges us to hold *multiple simultaneous perspectives* and to address different levels of awareness across the spectrum of human development. Integral Theory is a model that could help design educators and practitioners reconsider the scope, breadth, and multifaceted aspects of sustainability. Integral Theory, as developed by the philosopher Ken Wilber, is based on a cross-cultural comparison of human knowledge, experience, and inquiry [3, 4].

This paper is limited to the study of one of the most fundamental aspects of the integral model: *quadrants*. At its most essential level, Integral Theory organizes variables for any problem into a matrix of *quadrants* that intersect individual and collective phenomena with objective and subjective knowledge. These combined variables reveal the following considerations (See Fig. 1): 1) *Experiences*: self and consciousness; 2) *Behaviors*: science, mechanics and performance, 3) *Cultures*: meaning, worldviews, and symbolism, and 4) *Systems*: social and natural ecologies and contexts.

The four quadrants are not separate phenomena, but rather four simultaneous perspectives on any event. For this reason, this paper uses the term *perspectives* in place of *quadrants*. Each quadrant or dimension of reality is ever-present and co-arises with the others. The philosopher Michael Zimmerman notes that “The quadrant perspectives correspond generally to the four ways in which universities divide research methodologies (that is, truth-claim generating practices or paradigms): fine arts (UL), humanities (LL), natural sciences (UR), and social and systemic natural sciences (LR)” [5].

Often the two right-hand quadrants, both objective, are considered together, yielding *three value spheres*, associated with *Self* (UL), *Culture* (LL) and *Nature* (UR/LR), or alternatively, *Art, Morals, and Science*. Wilber refers to these as “The Big Three,” noting that each domain can be associated with the fundamental language distinctions of I, WE, and IT/ITS, or first, second and third person perspectives. This indicates that the perspectives are not opinions or speculative theory, but rather, are so fundamental as to be embedded in all natural languages. The Big Three are the classic value domains of *Beauty, Goodness* and *Truth*. The point is that every event in the manifest world has all three (or four) of those dimensions. You can look at any event from the point of view of the ‘I’ (how I personally see and feel about the event); from the point of view of the ‘we’ (how not just I but others see and understand the event); and as an ‘it’ (the objective facts of the event) [6]. The four fundamental perspectives on any occasion (or the four basic ways of looking at anything), turn out to be fairly simple: they are the *inside* and the *outside* of the *individual* and the *collective* [6].

![Figure 1 The four quadrants of Integral Theory](image-url)
3 THE FOUR INTEGRAL SUSTAINABLE DESIGN PERSPECTIVES

Figure 2 shows ‘The four Sustainable Design perspectives.’ The proposition is that each type of perspective is ever-present in all languages and cultures; each both discloses and occludes certain phenomena. An Integral approach to design is one that unites the beautiful, the art of design, and the good, the ethics of design, with the true, the science of design. We can also think of design as having four primary dimensions (the four perspectives of the quadrants), each requiring different perspectives on the practice and products of design:

- **Behaviours Perspective**: individual parts or members with their performance characteristics, activities, and functions;
- **Systems Perspective**: patterns of forms and flows of energy, information, people, and materials that order ecological and social relationships;
- **Experiences Perspective**: systemic members (human and non-human) with various forms of perception, sentience, and awareness;
- **Cultures Perspective**: shared meaning and understanding at various levels of complexity arising from individual members interacting with each other.

Applied to the consideration of Sustainable Design, the framework reveals that much of the current dialogue takes the Perspective of Behaviours [UR] and is concerned primarily with performance that can be ‘measured and weighed,’ an important, yet partial view. The Perspective of Systems [LR] reveals that eco-efficiency is not enough by itself to create healthy ecological pattern, and that a logic of ‘systems and relationships’ can be used to organize the UR logic of ‘parts and performance,’ either of which can constitute a reduction to ‘flatland’ (Fig. 3). High-performance design collapses everything to the upper right quadrant. Green, ecological approaches collapse reality to the lower right quadrant, or to the right side of the four-quadrant matrix (the web-of-life). Wilber calls this subtle reductionism as contrasted with the gross reductionism of the upper right. It may be that paying more attention to the perspectives of Experiences [UL] and Cultures [LL] has the potential to vastly expand the effectiveness of the objective arguments for ‘design with nature.’ Objective, mental arguments often fall on deaf ears for people oriented primarily with values from the subjective (what it feels like to me) and the inter-subjective (what is means to us) perspectives.

4 INTENTIONS AND CRITERIA FOR GOOD FORM FROM THE FOUR PERSPECTIVES

Architectural design is a discipline that requires the shaping of form; in the end, something is built or it is not a building. We can then ask the following questions: 1) *Thinking as designers, how shall we shape*
form for sustainability from each perspective? and, 2) From each quadratic perspective, what is the designer’s intention and what are the criteria for good form relative to sustainability?

From the Behaviours Perspective [UR] the design question is: How shall we shape form to maximize (eco)performance? Good form minimizes resource consumption and pollution while maximizing preservation and recycling.

From the Systems Perspective [LR] the design question is: How shall we shape form to guide ecological flows? Good form solves for ecological pattern by creating structure in the built environment that best accommodates ecological processes through mimicry of and fitness to the context of natural ecosystems.

From the Cultures Perspective [LL] the design question is: How shall we shape form to manifest the meanings of ecological systems and our relationships to them? Good form reveals and expresses ‘the patterns that connect’ in ways that celebrate the beauty of natural order, place inhabitants into relationships with living systems (or their idea of Nature) and situate human habitation in bioregional place.

From the Experiences Perspective [UL] the design question is: How shall we shape form to engender experiences of Nature and process? Good form orchestrates rich human experiences of Nature and its phenomena and creates centring places conducive to self-aware transformation to higher levels of (ecological) consciousness.

5 NEW PRINCIPLES FOR INTEGRAL SUSTAINABLE DESIGN

Given the heterogeneous ideas of Sustainable Design, the following illustrative principles have been defined in Figure 4 for each perspective. A principle is a statement of the fundamental basis of something, a truth or proposition, as an injunction, that makes ideas portable. Principles serve as the basis of a system of belief or reasoning, and they can be applied across a range of situations. There could be more or less than those given. The principles below follow as articulations of what can be called “an Overarching Principle of Integral Sustainable Design”: Design for sustainability by considering multiple levels of developing complexity in the intersecting domains of self, culture and Nature.

**Experiences perspective [UL]**
- Design profound aesthetic experiences of natural processes and a living world, accessing multiple senses.
- Design to access human psychological connections to place, at multiple levels from archetypes to the Transpersonal.
- Design centring places conducive to self-aware transformation to higher levels of Nature consciousness.

**Behaviours perspective [UR]**
- Design high-performance buildings that maximize efficient use of water, energy and material resources while minimizing waste and pollution.
- Design with on-site renewable resources of sun, wind and light.
- Design to create safe, healthy places with long-term value, eliminating toxicity to present or future generations.

**Systems perspective [LR]**
- Design at three levels of holarchy: to build a larger whole, to create a whole and to organize smaller wholes.
- Design living systems using ecology as the model. Fit flows to local renewable systems while also supporting techno-industrial ecosystems.
- Design solutions fit to particular places, considered as local site, larger neighbourhood and region.

**Cultures perspective [LL]**
- Design based on a high and conscious environmental ethic in which humanity and Nature both thrive in regenerative human ecosystems.
- Design to place people into significant relationships with Nature by making visible how culture is interconnected with living systems.
- Design for cultural communication by using the symbolic languages of design to make evident the meaning of ecological systems.

**Figure 4** Design principles from the four perspectives

6 THINKING AND BUILDING FROM THE FOUR PERSPECTIVES

Each of the four foundational perspectives require a different way of thinking. These distinctions in
thinking yield different concerns for Sustainable Design and a different sustainable architecture. They can also be combined. At an Integral level of complexity, a design might consciously employ all four.

6.1 Thinking and Building from the Behaviours Perspective

The Behaviours Perspective employs an analytic logic of parts and performance that allows designers to dissect projects, measure performance and assess results. It assures efficiency of the constituent building parts. We understand the order of the whole in terms of our knowledge of individual elements. It is the most clear and certain way of design thinking. Behaviours Perspective methods depend on observation and on what can be derived from observation. They require us to look scientifically and objectively at observable phenomena, the behaviours of things and people and at the relationships that are seen and quantifiable. Out of this measuring of things one arrives at high-performance buildings as a goal. Its logical extension is plus-energy buildings, zero-emissions buildings, and so on. This perspective reveals that we are running out of many resources and polluting at rates faster than Nature can absorb. It implies a shift from finite to renewable resources. It’s also the perception that takes our vital signs and the planet’s and researches what is healthful and what is not. Thus, in addition to net-zero resource use, infinite recycling and the transition to design with renewables, it promotes a non-toxic environment. Who can argue with that?

![Santa Clarita transit maintenance facility](image)

**Figure 5**  Santa Clarita transit maintenance facility, Santa Clarita, California, 2008; © HOK

The first LEED Gold certified straw bale building (Fig. 5), this super-insulated building utilizes photovoltaics to provide half of the operational energy needed and reacts automatically to changing climatic conditions of its desert climate. It uses under-floor air distribution and high-performance glazing. The combination of high- and low-tech solutions helps this building to exceed stringent California energy efficiency standards by 40 per cent.

6.2 Thinking and Building from the Systems Perspective

The Systems Perspective uses a logic of systems and relationships. It is concerned with finding patterns as a basis for making effective design decisions. It is an associative logic that allows designers to see relationships between facts, forces, processes and form. Whereas the Behaviours Perspective tends toward thinking about the ‘application of technology’ and uses quantity as the criteria for success, this perspective embeds technology in architectural patterns, fitting design to its contexts. The Systems Perspective is inter-objective, a third person perspective on social and natural systems. Integration is its most prized value.
In buildings, energy-efficient elements can be combined in intelligent ways to make buildings as energy systems. An example is a passive solar-heated building that can be combined with efficient envelopes and with spatial organizations, orientations and materials to collect, store and redistribute solar energy in complex diurnal and seasonal patterns. The systems of the passive solar-heated building can be combined with those of the naturally ventilated and daylighted building systems. These can be integrated with active mechanical systems, on-site green power systems, and so on. These energy systems can be further integrated with spatial systems, with patterns of use and social order, the order of structural, material and construction systems, with hydrologic systems in the building and site, natural habitat on site, larger contextual urban systems, and so on.

*Figure 6* Solar Farmhouse, Fox, Arkansas, © Gary Coates, with Kansas State architecture students

In the Solar Farmhouse (Fig. 6), the vernacular dogtrot type meets an atrium and solar greenhouse in a traditional Ozark mountain farmhouse language. The building is organized a series of interrelated design patterns, both social and climatic [7]. The "Dog-Trot Atrium" pattern as a transformation of Alexander's pattern, "Common Areas at the Heart," functions also as a stack-ventilation room and a toplight room. The house is heated by direct gain rooms with solar collection from individual windows and a ridge-top skylight, combined with a substantial two-storey sunspace. Translucent, cylindrical water-filled fiberglass tubes located between the sunspace and the great room serve as thermal mass (and as a food-producing greenhouse), with additional mass in an under-floor rock bed and in the stone walls of the greenhouse stair. The open plan and section allow warm air to rise and enter upper rooms via interior windows, while stratified air is recovered from the top of the atrium and returned to ground level.

6.3 Thinking and Building from the Experiences Perspective

In thinking about the Experiences Perspective, we are concerned with the interior experiences and intentions of designers and with the experiences of the occupants of a sustainable design. For Sustainable Design to be more effective, designers can address the fundamental reality and richness of our human interior experiences. Essentially, if people are to love sustainably designed environments, by necessity designers will have to create loveable places! This means we may choose to design rich full-person experiences, including a range of aesthetic experiences, because responsible action flows most freely from affection, which of itself requires an engaged relationship. A mature Integral Sustainable Design fully engages the human experience of Nature and the subtleties and richness of human feeling in space and place. It is also time for the cultivation of a highly developed theory and practice of Integral Sustainable Design aesthetics that is developmental and multi-perspectival.

To have meaningful discourse about ecological relationships in designed things, individuals must be able to perceive and experience these relationships. Sustainable Design can then ask the design question: *How can important ecological relationships—and the ways design creates relationships to these—be made into significant human-felt experiences?*
Through extensive design for natural ventilation, the Marie Short House (Fig. 7) creates the experience of the process of ventilative cooling. Adjustable steel louvers in the walls control the flow of wind-driven cross-ventilation, while fixed wood louvers allow airflow beneath gables and above open porches. Wide eaves protect from the sun; open plans align space and moving air. And the building communicates the relationship of form to these processes. In its passivity is the occupant’s experience of connection to process and place.

Think of the building as an instrument that’s picking up all these sounds..... It’s addressing the topography, the wind patterns, light patterns, altitude, latitude, the environment around you, the sun movements. It’s addressing the summer, the winter and the seasons in between. It’s addressing where the trees are, and where the trees are will tell you about the water table, the soil depth, climatic conditions.’ —Glenn Murcutt [9]

6.4 Thinking and Building from the Cultures Perspective

Designers understand that both the relationships of the natural world (gravity, climate, energy, ecology, etc.) and human relationships (social interactions and human interactions in culture) must be solved for. Seeing Sustainable Design from the Cultures Perspective asks designers to look at how any design places us into relationship with Nature in ways that embody meaning. Anything we design creates or modifies a system of ecological relationships and places humans into an inhabited system in which our relationships to natural forces and processes are tightly bound.

Looking at design from this perspective, designers can ask, How can Sustainable Design be appropriately ordered to fit its cultural context? and How can the patterns of ecological relationships in which the building participates be made culturally significant and appropriate?

Serving as a place to educate visitors on native ecosystems, the Shangri La Botanical Gardens (Fig. 8) use the surrounding site as part of its regionalist architecture. This LEED Platinum project serves primarily as an interpretive centre for the site’s native ecosystems (cypress and tupelo swamp, wooded
uplands, and prairie lowlands) as well as a facility for study and research. Nature centres are some of the clearest American expressions of a postmodern Cultures Perspective on Sustainable Design, because they take a clear attitude on what Nature is and tell the story of the human relationship to Nature. While it may perform well, this performance is in service to a cultural ethic.

7 CONCLUSION

A premise of Integral Sustainable Design is that more expansive perspectives on the world are necessary to meet the diverse ecological, social, cultural, ethical, and technological challenges of the twenty-first century. Species interdependence and humans’ role in shaping a sustainable future require new approaches that include, yet expand the current emphasis of Sustainable Design on scientific-objective measures. The implication for design is not that each building should address all four perspectives all the time, but rather, that one can be integrally-informed by this expanded view and thus consider, using the tools and methods of that view, each of the four perspectives to question whether or not the issues embedded in the each are relevant for the project at hand.

In addition to designing high-performance buildings and sites, a more Integral view of Sustainable Design incorporates understandings of problems and their solutions that also address the other three important classes of issues.

The highest levels of performance require a systemic approach using method and concepts revealed only from the Systems perspective. Performance in an ecosystem is about dynamically balanced exchanges of energy, information and materials that bring systemic health. Ecological health trumps green efficiency.

The inclusion of a focus on the Experiential Perspective on Sustainable Design fosters the possibility of direct personal knowledge of Nature. Knowledge always precedes care. Care often gives rise to spontaneous action that benefits the object of care. We humans tend to care more about those we know than those we don’t know. Having groups of people have experiences of ‘Nature-via-design’ gives rise to dialogue and interpretation, the key to cultural transformation. Culture in a sense is the effect of all of our conversations. So as designers, can we give people something to talk about?

When Sustainable Design manifests, reflects and expresses ecological processes (from the Cultures Perspective), such as the water cycle for example, it gives people the opportunity to become more aware of living processes and their relationships to them. The stories of our relationships to Nature as told through ecologically expressive built works are powerful. Such expression could allow Sustainable Design to become as transformative of the settled landscape as was post-war suburbia.

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