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INTEGRATING THE HUMAN FACTOR INTO THE HOLISTIC UNDERSTANDING OF SUSTAINABILITY

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Abstract. Using a number of literary sources with sustainable design and architectural phenomenology as their foundation, this paper uses Integral theory, drawing on the writings of Ken Wilber and Mark DeKay to justify the importance of human architectural experience in the holistic view of sustainable design. The literature critiques modern practices and ideas of sustainability and identifies factors that contribute towards the success of sustainable building. It explores the implications for an Integral approach to sustainable design and then uses it to analyse the relationships that exist between the objective and the subjective value spheres of Integral theory.

Keywords. Human factor, Architectural phenomenology, experiences, aesthetics, sustainable design

1. Introduction

Man’s parasitic relationship with nature, a resulting consequence of the exponential technological and economic development of the past century has engendered a host of environmental problems such as climate change, resource depletion and conservation. The built environment stands as a significant contributing factor to these environmental concerns, accounting for forty per cent of the world’s energy use (WBCSD, 2009). The concept of sustainable development was introduced by means of the definition:

That which meets the need of the present without compromising the ability of future generations to meet their own needs. (WECD, 1987)

This definition of sustainable development was successful in its attempts to capture the attention of the world and spread awareness about these concerns. However, it has now become obsolete, as it does not address the human experiential parameter. This deficiency is also apparent in the newer guidelines of sustainable development in the form of building rating
schemes, where sustainability is addressed only by objective, measurable factors. This focus on building performance results in un-aesthetic architecture which, according to Listiburek (2008) has a laudable intent but rewards “features that should really be regarded as best practice”. Porteous (2004) argues that some “overtly green design is too bland, or too unadventurous, to do justice to its cause”. There arises a sense of irony when one realises that, given the primary objective of sustainability is to ensure the future fulfilment of human needs, it fails to acknowledge human psychological needs. The purpose of this paper is not to undermine the importance of the objective factors of sustainable development. But to use Integral theory to discover relationships and hierarchies that justify the importance of the human factor in sustainable development. The paper acts as a medium through which a number of questions are raised, however it is not within its scope to answer them.

2. Integral theory

A number of theories in the recent past that have critiqued the objective definitions and been conducive to the holistic outlook of sustainability. One such theory is Integral theory; a framework developed by American Philosopher Ken Wilber. It begins with the assumption that everyone is right – at least partially (DeKay, 2011) and offers four simultaneous perspectives that must be consulted in the resolution environmental problems. These perspectives are represented by four quadrants and each takes a different view of the situation; starting with experiences: which looks at individual human experiences with nature, behaviours: which looks at the environmental performance of the problem. The cultures perspective: looks at what the problem means to its context and systems: looks at how the problem responds and interacts with its context. However, regardless of the all encompassing nature of Integral theory, it tends to look at human experiences primarily in an ecological sense and fails to comment on its interactions and relationships.

![Figure 1: The four perspectives of Integral theory according to Ken Wilber](image-url)
3. The right hand side of integral theory

One of the primary aims of an Integral approach is the incorporation of two broad paths; the interior and exterior descriptions of the world. The exterior path starts with objective, empirical, and often quantifiable observables and takes the physical world as the most fundamental. In the Integral analysis of sustainable development it could be said that these exterior views are comprised of quantifiable entities such as building rating schemes and building integration into ecological and contextual systems. Essentially, these happen to be the most common descriptors of sustainability. The Upper Right and Lower Right quadrants are briefly discussed below.

3.1. BEHAVIOURS PERSPECTIVE – UPPER RIGHT

The intentions of sustainable design from this perspective take into account reductions in the consumption of resources, the creation of more internal loops within building economies, and the reduction of waste products and pollutants, as recognised by rating schemes.

3.2. SYSTEMS PERSPECTIVE – LOWER RIGHT

The Systems perspective, considers the world as a living system. It looks at the ways in which form can be used to guide ecological flows, and a successful form will create a structure that accommodates ecological process through mimicry and fitness into its natural context. (DeKay, 2011) Here, it is also important to observe a building’s performance in economic systems. Therefore, buildings that are successfully integrated into the contextual system ensure the successful integration into an ecosystem. For example traditional vernacular building practices have, due to the shortage of resources, tended intuitively, through trial and error towards economically and environmentally optimal solutions.

4. The left hand side of integral theory

Among the empirical approaches exist the ‘interior’ approaches that deal with the immediacy of the conscious itself (Wilber, 1997). These approaches do not deny the importance of empirical data, but highlight the definition of the word ‘data’ as direct experience, and the only genuinely direct human experience is one that is immediate and interior. The upper left quadrant of Integral theory focuses on the interior of the individual and the lower left, on the interior of the collective (Wilber, 1997). The literature reviewed below explores the cultural territory and the experience of architecture in the Integral analysis of the left hand value spheres.
4.1. CULTURES PERSPECTIVE – LOWER LEFT

The Cultures perspective considers sustainable design as a way of manifesting ecological value in cultural terms. For sustainable design to succeed in having wide influence, it will have to become more encompassing and less dismissive of subjective or interior values. Thoughts themselves arise from cultural backgrounds that give texture, meaning and context to them. Therefore the cultural community serves as an intrinsic background and context to individual thought. In short, individual thoughts can only exist against a vast backdrop of cultural practices, languages, meanings and contexts, without which humans could form virtually no individual thoughts at all.

4.2. EXPERIENCES PERSPECTIVE – UPPER LEFT

The Experiences perspective presents the concept of human feeling as a dependable “shared barometer of quality and ties patterns of experience to patterns of space” (DeKay, 2011). Sustainable design, from the experiences perspective is understood through the examination of its phenomenology as experienced by occupants, the human aesthetic response, the intentions of designers; and the attention on creating rich human experiences of sustainable design, the interior development of the designer that allows understanding and practice of an Integral Sustainable design (DeKay, 2011).

Aesthetics is a major focus of attention of the experiences perspective and its experience is a response to conditions of beauty. DeKay, in his seminal book *Integral Sustainable Design: Transformative Perspectives*; (2011) has presented a proposition for the five stages of sustainable design aesthetics. They encompass the experience of nature both logically and experientially. This paper aims its focus on the first two stages: the first of which being, Visual Aesthetics, which refers to the aesthetics of visual space and order including the formal compositional principles of colour, unity, balance, variety, repetition, and proportions. The second being, Phenomenological Aesthetics, which involves the experiential aspect of process and refers to the fact that beauty is not confined only to what something looks like, but also by how humans experience it with multiple senses and includes the factors of time and change.

The discussion that follows delves into architectural phenomenology in order to retrieve the architectural experiences that need to contribute towards shaping the experiences perspective of an Integral overview of sustainability. The literature on architectural phenomenology is structured according to the first two stages of design aesthetics according to Mark DeKay for clearer consideration.
5. Architectural phenomenology

5.1 VISUAL AESTHETICS

According to Steven Holl (2006), humans possess intuitive powers that enable the perception of subtle mathematical proportions in the physical world. Ghyka (1977) puts forth an argument for proportions based on mathematical principles found in nature. These arguments go beyond the simple understanding of the mysteries in nature, demonstrating that the Golden Section ratio of $1:1.618$ is the key ratio in organic growth. The golden section and its related Fibonacci series have continuously reappeared throughout history in the most visually pleasing and intense works of architecture, from the Ancient Egyptian Canon of proportions to great works of Greek Architecture. The idea of the Modulor system, a measure based on mathematics and the human scale, was introduced by Le Corbusier to enable architecture and design to recapture their long lost state of harmony with nature and the universe and become a true continuation of nature into the man-made environment (von Moos, 1979). The literature highlights the necessity of the incorporation of human scale and proportions in architecture; they illustrate the characteristics of good architecture. This human scale, relative to proportional scale and urban scale, all extremely important in architecture have been especially overlooked as a criterion of sustainable design.

5.2. PHENOMENOLOGICAL AESTHETICS

There exist five basic senses; they are the visual system, the auditory system, the taste-smell system, the basic orienting system and the haptic system. Montagu (1986) writes that the Western world is now beginning to discover a new awareness representing the deprivation of sensory experience in a technologized world. This new awareness is vehemently projected by a number of architects around the world today, who are attempting to re-sensualise architecture through a strengthened sense of materiality, and hapticity, texture and weight, density of space and materialised light.

The role of light and shadow in the formation of experiences is well elucidated by Holl (2006) when he states that it is not surprising that some architects have professed that the entire intention of their “work revolves around light, just as some painters focus on the properties of colour”.

Pallasmaa (2005) states that during overpowering emotional experiences, humans tend to close off the distancing sense of vision, such as when listening to music, or caressing a loved one. Therefore the incorporation of deep shadows is vital. The closing off of the visual sense heightens the experiences of the other senses, such as, the auditory sense. According to Rasmussen,
(1993) the live reflection of echo and re-echo within a stone cathedral increase one’s “awareness of the vastness, geometry and material of its space”. The same space with a carpet and acoustical treatment would be devoid of this experiential dimension (Holl, 2006).

Holl (2006) suggests that the haptic realm opens up when the “materiality of the details forming an architectural space become evident”. He likens this intensified sensory experience to the taste of a meal dependant on the flavours of authentic ingredients. He states that architecture holds the power to inspire and transform our day to day existence. The mundane daily act of pressing a door handle and opening into a light washed room can become profound when experienced through sensitised consciousness. “To feel these physicalities is to become the subject of the senses”.

6. Discussion and conclusions

6.1. DISCUSSION

It is the general judgement of many that sustainable design is not associated with conditions of beauty and human experience. It is the over emphasis of the objective factors that has diminished the subjective aspects leading to unattractive green design. However, emergent concepts of sustainable design seem to be incorporating aesthetic and experiential factors in a holistic view of sustainability. This fact makes one wonder as to why the technical aspects were the primary foci and why the human and experiential factors are only recent considerations. Orr (1992) uses a medical analogy to answer this question: If a man suffers a heart attack, the primary operation is the restoration of his vital signs to normal, in order to keep him alive. But, after his recovery comes the longer, slower process of dealing with deeper causes such as diet, exercise, stress and relationships. The primary need of sustainable design was to address this ‘heart attack’ of the earth which explains the greater focus on the technological factors of the Right Hand Side of Integral theory. It could be said that now that the immediate, ethical concerns of sustainable design have been addressed and widely accepted, it is its experiential value that requires attention. It is only through the holistic understanding of sustainability and the striking of a delicate balance between the objective and subjective value spheres that it will live up to its true potential.

The juxtaposition of the Right and Left hand sides see the emergence of a number of relationships. First, is the relationship between the visual aesthetic factors of form, shape and image with performance. A building’s shape could have an enormous impact on its performance, as shape is a contributing factor toward material use and energy consumption. Also, the consid-
eration of human proportions as a determinant of a building’s shape could result in a spatially comfortable piece of architecture that is not only aesthetically pleasing but is also efficient. The positioning of a building in its context, with the incorporation of architectural experiential aspects such as day lighting, shadows, ventilation and location along wind paths could simultaneously contribute towards sensory appeal and building performance, connecting the Right and Left sides.

Visual and phenomenological aesthetics should not only be considered as fringe benefits to sustainable design, they exist as major contributing factors to the very success and survival of it. People tend to form positive associations with things that they find beautiful. This occurs regardless of the efficiency of performance or the practicality of the object. Therefore, in order for sustainable design to have wider acceptance, it needs to be aesthetic. The long term value of a building is lost without its sensory appeal; uninspiring design does not encourage the forming of bonds and relationships. People do not love objects because they have zero emissions or are biodegradable; these objects are loved because of their experiential factor. A more attractive, influential and experiential design discourages people from abandoning it. The popularity of sustainable design would be greater if it was more aesthetically pleasing visually as well as phenomenologically, and this would be a contributing factor towards its success. People will also be more reluctant to abandon buildings in which they have had significant spatial experiences and memories. This could be a contributing factor towards sustainability, as the longevity of these buildings could reduce their levels of embodied energy over time, thus influencing performance. Architecture that is considered to be great is founded on these phenomenal aspects. Such as the Chapel of Notre Dame du Haut, Ronchamp by Le Corbusier.

Looking at the example of the chapel at Ronchamp in a Cultures perspective, it is evident that the large numbers of individual spatial experiences within this building have influenced collective cultures into acknowledging it as a significant piece of architecture. If one were to question as to how the experiences perspective can be measured, as it is not possible to empirically measure human experiences within buildings, as experiences are intangible and therefore being impossible to rate on a scale. The answer to the question lies in the Cultures quadrant. The influence of a large number of positive individual experiences in a particular piece of architecture form the basis of the collective cultural experience and the collective opinion. This collective opinion therefore stands as a testament to the success of the experiential perspective.

However, the notion of beauty and aesthetics tend to be largely influenced by cultural factors and background, therefore contributing towards
subjective individual experiences. Most Western cultures, for example, see beauty in simplicity, whereas most traditional Eastern cultures see beauty in ornament. These tastes influence the architectural language of each individual culture, giving them a unique identity. Due to this fact it is imperative that cultural and contextual factors are considered when designing in diverse contexts. Architecture that is regionally specific tends to be ecologically specific. Therefore, designing regionally specific architecture not only addresses the cultural perspective but also the systems perspective. A building has greater value when it is culturally significant and is also integrated into the region’s ecological system.

In contrast to the subjective notions of beauty, the experiences of spatial comfort and architectural phenomenology are quite universal. Mark DeKay (2011) associates this universal culture with the fact that human bodies and psychological natures have evolved over millions of years, and due to that, humans are more alike than different. According to him this truth resides in the deep archaic, mythic and archetypal realms where phenomena occur in similar ways within all. Therefore the spatial experiences of architecture will be similar worldwide. The same could be said about proportions, although there are slight continental variations in human anthropometrics, the experiences of spatial proportion will be roughly universal. DeKay, continues that similarly there are variations among cultures and regions as to the interpretation of these phenomena; but even there within a particular culture there is vast agreement about what is experienced as good and desirable. As an overview it could be said that it is mostly the experiences of the eye that are subjective to individuals, experiences of the haptic sense tend to be fairly universal, this could therefore make them easier for consideration as a contributing factor to sustainability.

6.2. CONCLUSION

It was deducible through the discussions that the relationships that occurred in Integral theory were not direct relationships of the right hand side and the left hand side, but rather were a series of interconnected phenomena that inextricably linked one to another. The holistic outlook on sustainability through Integral theory required each factor that existed in each value sphere and the removal of even one factor undermined this holistic view. Upon initial examination of Integral theory, it seemed to be an innovative system that was successful in the simplification of the complexities of sustainability. However, the research process that followed made this system appear ambiguous as its divisions of the four quadrants seemed restrictive given the interconnected nature of the factors. At the end of the research the four per-
spectives of the four quadrants appeared not as four different parts but as a series of interconnected relationships that was cyclical in its simplest sense. The following diagram shows the very essence of these interconnections.

![Diagram showing relationships between the four perspectives](image.png)

*Figure 2: Relationships between the four perspectives*

The explanation of the diagram as gauged through the research is that individual human experiences influence collective cultures. This integration and cultural acceptance determine a building’s success in terms of integration into ecological, economical and contextual environments (systems perspective). This successful integration in turn affects the optimal performance of the buildings (behaviours perspective) through the efficient incorporation of the features of the site into the building. Human experiences and cultures also influence performance of buildings through embodied energy in terms of longevity. Furthermore, it is the human experiential parameter that appears to be the starting point as it influences both cultures and behaviours.

The actual picture of these relationships, considering each of their subcomponents could in fact resemble a complex system of myriad relationships. This however would be more labour intensive and time consuming, as it would require in depth research over a vast range of subjects and would not be within the practical scope of this paper.

The discussion above illustrates the relationships between the four quadrants of Integral theory, it is apparent that the value spheres of the four quadrants are interconnected and the changes that affect a perspective that lies within one quadrant will have effects on the other three. The discussion therefore justifies the significance of the human experiential factor in architecture. The success of sustainable design purely through the behaviours and systems perspective is not sufficient. Regardless of its rating, the building would be a failure if the occupants and users within it do not feel aesthetically content, both visually and phenomenologically. The theoretical potential therefore exists to facilitates the design of sustainable architecture that is not only technologically efficient (Behaviours quadrant), integrated into ecolog-
ical and economic systems (Systems quadrant) but is also visually and phenomenologically aesthetic (Experiences quadrant) and finally is culturally significant (Cultures perspective). As according to Hosey (2012) Aesthetic attraction is not a superficial concern – it’s an environmental imperative. However, an attempt to incorporate the experience perspective into a measurement of sustainability poses a number of limitations, one of the main limitations that could be seen in a study is the time scale involved in the evaluation of a building, in terms of individual experiences being translated into a cultural opinion. Another limitation of the study could be with regard to the actual measurement of the experiences and cultural perspectives. The complexities of these evaluations tie in with the complexity of sustainability as a whole. In order to make a more comprehensive evaluation these complexities need to be taken into consideration. However, in terms of feasibility of measurement, certain factors would need to be compromised, which undermines the value of the evaluation. Recommendations and solutions to these problems would need more research and are not within the scope of this paper.

References