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AN INTEGRAL PERSPECTIVE OF INFORMATION SYSTEMS

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Abstract

Given the information revolution of the past decade, new ways of viewing information systems and studying the effects of change are demanded. In this research-in-progress, we begin an exploration of Wilber's holonic model and apply it to the IS field. Applications of this holonic model have recently exploded in psychology, business, health, and many other disciplines. We also question the commonly held belief that systems-theoretic approaches offer a complete basis for viewing information systems in an integral manner. We suggest that the integral perspective provided by the holonic model not only includes the dominant systems view but also offers more richness and creativity. We show how the model may be applied to systems analysis. The implication of the integral perspective provided by the holonic model is that if IS has to be truly holistic and relevant, it has to pose hard-hitting and more fundamental questions, expand its boundaries without giving up what it already has, and build deeper bridges with increasing numbers of disciplines.

Keywords: Philosophy, model, holon, systems theory, information systems

Introduction

Given the radical changes in the past decade, new ways of viewing the world and studying the effects of change are demanded. Among the most dramatic changes taking place today are in information systems. The implications of these changes demand that we look at information systems holistically. The dominant paradigm of holism for the IS field has been systems theory, which is obvious from the fact that the term "system" is contained in the name of the field. But how holistic is systems theory? In this research-in-progress, we question the commonly held belief that systems-theoretic approaches offer a *complete* basis for viewing information systems integrally. We describe a holonic model developed by Ken Wilber (1998) and begin an exploration of its application to the field of information systems. We suggest that an integral perspective based on the holonic model not only includes and subsumes the systems view but also offers considerably more richness and creativity. To be clear, strictly speaking, what we suggest is not another *perspective* but an integral way to capture relevant perspectives of the phenomena under study. Applications of this holonic model have recently exploded in psychology, business, health, and many other disciplines.

Holons and Holarchies

Wilber's model is based on the concept of a holon, first proposed by Arthur Koestler (1964). The world can be viewed as being composed of interrelated elements; each element is a whole that is simultaneously a part of another whole. For example, a whole individual is part of a family, which is part of a community and so on. Thus, each element is not just a whole nor a part but a part/whole, called a holon. The holon simultaneously possesses both agency (wholeness) and communion (partness). According to Wilber (1998, p.68), "the fact that each holon is actually a whole/part places it in a profound tension: in order to exist, it must in some sense retain its identity or its own agency as a relatively autonomous whole; yet it must also fit in with the other holons that are an intrinsic part of its environment." Many major problems of the world may be seen as severe disruptions of this delicate balance between the holon's need to maintain its own wholeness (*agency*) and its need to retain the extensive network of relationships of which it is a part and upon which it depends for its survival (*communion*).

Koestler pointed out that all hierarchies are composed of holons. These hierarchies may also be termed "holarchies" because the holons typically show increasing orders of wholeness, unity, and functional integration. A simple example of an irreducible holarchy begins with atoms that make up molecules that make up cells, tissues, organs, and human beings in multiple connected chains. Koestler sees this holarchy as developing by a process of differentiation-and-integration. As cells divide and differentiate,

they are simultaneously being assimilated into structures displaying higher unity and deeper integration – the tissues and organs. If anything goes wrong in this process of differentiation-and-integration, a pathology develops, which is a breakdown of the balance between the holon’s properties of partness and wholeness (or its agency and communion.)

Wilber’s Holonic Model

In an effort to classify holons, Ken Wilber (2000) extensively researched several hundred frameworks and hierarchies from different fields ranging from the hard sciences to systems theory to philosophy, psychology, and spirituality. He observed a common high-level pattern in all the hierarchies *without exception*: each of those hierarchies dealt with the **interior** or the **exterior** of the **individual** or the **collective**. Based on this observation, Wilber developed a four-quadrant model for classifying holons, also called the holonic model, which can be used to study any social process or phenomenon. The model is summarized in Figure 1. The model may be seen as two pairs of halves: the upper and lower halves, and the left and right halves. The upper half is the individual view and the lower half is the collective view of the holons. The left-half holons represents subjective and interior realities that are a result of directly lived awareness and experience. The right-half holons represents objective and exterior realities as studied with empirical scientific investigations. Now, let us look at each of the quadrants.

	<i>Interior</i>	<i>Exterior</i>
<i>Individual</i>	<u>Interior-Individual (Upper-Left)</u> Intentional Awareness, Sensations, Emotions Perceptions, Concepts, Desires, Beliefs, Vision	<u>Exterior-Individual (Upper-Right)</u> Behavioral Cells, Atoms, External Entities, Computers, Biological Organisms
<i>Collective</i>	<u>Interior-Collective (Lower-Left)</u> Cultural Shared goals, Meanings, World-views, and Values	<u>Exterior-Collective (Lower-Right)</u> Social-Organizational Societies, Organizations, Groups, Nations, Planets

Figure 1. Wilber’s Four-Quadrant Holonic Model

The **exterior-individual** or upper-right quadrant is what is normally understood to be the domain of modern sciences – e.g., physics, chemistry, computer science, and biology. The holons in this quadrant (e.g., cells, tissues, organs) show increasing wholeness, unity, and integration as we move up the levels of the hierarchy. When we look at communities or societies of the upper-right holons, we move to the lower-right, the **exterior-collective** quadrant. Here, as we move up the levels of the hierarchy, we see greater *depth* and smaller *span*. That is, a higher-level holon (e.g., an industry) has greater depth, in that it includes a greater number of holons as its parts (e.g., companies), but a smaller span because there are fewer holons at its level. The research on Groups and Group Dynamics may be seen as an example of the study of holons in the lower-right quadrant. The **interior-individual** or upper-left quadrant is the quadrant of inner awareness and intentionality. The holons in this quadrant include prehension, sensation, perception, emotion, concepts, desires, beliefs, vision, etc. This domain has long been denied by scientific materialism, behaviorism, and positivism. It is in recent decades that such fields as cognitive psychology and advertising are gaining recognition for their work in this quadrant. The interior-individual holons of inner awareness can be seen as elements of a shared, collective world-view, which makes up the **interior-collective** quadrant. The term “culture” (e.g., company culture) is frequently associated with these shared values and meanings.

The left half of the holonic model is an interior view of the right half of the model but both halves possess clear characteristics, different enough that it would be a mistake to attempt to totally reduce one to the other. A case in point would be the distinction between the *mind*, which belongs to the interior-individual quadrant, and the *brain*, which is part of the exterior-individual quadrant. In Wilber’s words (1998, p. 69-70),

The mind is known by acquaintance; the brain, by objective description. You know your own mind directly, immediately, intimately – all the thoughts and feelings and yearnings and desires that run across your awareness moment to moment. Your brain, on the other hand, even though it is “inside” your organism, is not interior to your awareness, like your mind. The brain, rather, is known in an exterior and objectifying fashion; it consists of systems such as the neocortex and neurotransmitters such as dopamine, acetylcholine, and serotonin. But

you never directly experience something you identify as dopamine. You do not get up in the morning and exclaim, “Wow, what a dopamine day!” In fact, you cannot even see your brain unless you cut open your skull and get a mirror. But you can see your mind right now.

It is clear that all four quadrants are not isolated realities but are inextricably related parts of an integral reality. For example, the intentions and values of an individual (Upper-Left quadrant) have empirical correlates that are observable on the outside (Upper-Right quadrant) as we have seen with the case of the mind and the brain. An integral perspective demands that we view a phenomenon or object under study from all four quadrants. The issue of which quadrant is more important can be asked only within the context of a phenomenon under study.

The evidence for the holonic model comes from the work of leading scholars and researchers, far too many to list here, in each of the four quadrants. Note also that the holonic model corresponds to widely-held paradigms such as Karl Popper’s three worlds: subjective (I), cultural (WE), and objective (IT) or Plato’s Beautiful, Good, and True or Kant’s critiques of Pure Reason (science), Practical Reason (morals), and Judgement (aesthetics). The connections may be seen by recognizing that the holonic model addresses the subjective (I) in the upper-left quadrant, the cultural (WE) in the lower-left quadrant, and the objective (IT) in the two right quadrants.

Applications of Wilber’s Model to IS

How can this model be applied to information systems and what are its implications for IS research, teaching, and practice? This research is progressing in this direction. As a starting point for this exploration, let us examine the holonic four-quadrant model in a specific IS context, say, systems analysis as in Figure 2. A sampling of representative holons are shown in each of the quadrants.

	<i>Interior</i>	<i>Exterior</i>
<i>Individual</i>	<u>Interior-Individual (Upper-Left)</u> Unconscious biases, motivations, and conditioning of the systems analyst	<u>Exterior-Individual (Upper-Right)</u> Specific techniques of data gathering and modeling
<i>Collective</i>	<u>Interior-Collective (Lower-Left)</u> Shared cultural meanings of different user groups and analyst communities	<u>Exterior-Collective (Lower-Right)</u> Modeling paradigms, methodologies, and families of techniques

Figure 2. Wilber’s Holonic Model Applied to Systems Analysis

Viewing systems analysis from this perspective suggests several research questions: For example, we have a plethora of modeling methodologies (and we are creating more and more) but do real human beings, i.e., modelers, truly systematically follow a methodology? Why is it that even after following the same methodology, no two models created by different analysts for the same situation are alike? Even in a hard science such as Physics, the observer and observation affects the observed. How much more is this true where complex human beings are involved? What unconscious biases arising from their conditioning and training do analysts bring to the art and science of modeling? What are the hidden agendas and motivations of users and analysts that could make or mar the systems projects? Why do we not refer to the aesthetics of information systems as we do of works of art? When a systems project fails, an analysis of failure is usually based upon objective exterior factors such as cost and time but what about interior causes, hidden agendas, and conflicts that may be semantic, pragmatic, political and cultural? Is there any boredom involved in drawing tedious multi-level dataflow diagrams and what effect might this type of internal fatigue have upon the quality of the diagrams?

Practitioners are also asking similar questions. For example, Armour, a vice-president of a software consultancy asserts that the human factor in software development is what gives a project team its soul. He uses the term “soul” in a non-theistic way to refer to the human factor that is not just physical, intellectual, emotional and organizational. It is spiritual. In his words (Armour, 2002, p. 11),

As an industry, we have spent much time working on the physical and intellectual dimensions of building systems. What about the others? Specifically, what about the spirit of projects? I have never seen any research on the spirit of projects. Anecdotally, however, my personal experience has been that spirit – present or not present on a project- has been the deciding factor...We can intellectually construct methodologies and processes ... But what about the spirit? Can we manage and optimize the non-physical, non-intellectual, and non-emotional components of projects? I think so. In fact, I think this might be one of our greatest challenges as a business, and one that truly gives meaning to what we do. Personally, just knocking off another system doesn't do much for me anymore. What does matter to me is whether we made a difference. Did the system add value to lives and industries? Did we learn? Is it important? Do others think it is important? Did we grow? Are we better?

In the broader and richer context of the holonic model, it can now be seen that traditional system-theoretic approaches have largely focused on the right quadrants of the model. Systems theory is indeed holistic, not atomistic or reductionist, but the holism is what Wilber calls a thoroughly flatland holism. It is a holism that focuses on the ITs but does not include the interior realms of the I and the WE, the subject of the left quadrants. According to Wilber (1998, p. 57),

It was rather a holism, a systems theory, that included nothing but ITs, nothing but objectifiable processes scurrying through information loops, or gravity acting at a distance from objects, ...or digital bits running through neuronal circuits. Nowhere in systems theory (or in flatland holism) could you find anything resembling beauty, poetry, value, desire, love, honor, compassion, charity, ... moral wisdom, or artistic expression.

In short, systems theories have given and are giving us a very valuable view of information systems, which is not to be denied. However, as we can see, this view is only one aspect of the information systems reality. An integral all-quadrant view helps us envision the possibility of other issues and methods for information systems research, teaching, and practice. This holistic vision may also provide a starting point for transcending such disagreements among IS researchers as the dispute over qualitative vs. quantitative research methods or the controversy over basic research vs. applied research. When we see that the two “opposing” sides are not truly mutually exclusive but are both necessary to integrally view the field and that one method or approach may be more appropriate for studying some issues in some quadrants of the holonic model, where is the fundamental battle?

A positivist approach to study information systems, while being necessary, creates a flat land if it denies its interior, subjective side. (The same would be true of interpretive approaches if they denied the exterior reality.) In a positivist *only* type of research, values, feelings and intuitions are ignored and only operationally measurable constructs are reported as if they constituted the only truth about the phenomena under study. It is true that the interior left-hand side is difficult to study with traditional methods of science because it is subjective and not directly measurable. But is that reason enough to ignore it? Or to consider it lesser and unimportant in some sense to the exterior, objective side? It is also important to recognize that even in an objective empirical investigation, the way an experiment is set up and the subsequent data analyses are all subjective processes during which the researcher's conscious and unconscious biases are acting, probably in the direction of refuting null hypotheses for getting publishable results.

The holonic model is being widely used in many different fields. Its application in the IS field opens up possibilities for new ways to view information systems teaching, research, and practice and to pose questions that have not been asked or addressed adequately in the past. The implication of the integral perspective of the holonic model is that if IS has to be truly holistic and relevant, it has to pose hard-hitting questions, expand its boundaries without giving up what it already has, and build deeper bridges with increasing numbers of disciplines. Wittgenstein (1980, p.16) once said “One doesn't put the questions marks *deep* enough down.” Can we as members of the IS community put the question marks deep enough down?

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