

THEORETICAL CONSTRUCT (See notes)	KNOWLEDGE ASPECTS									
	Data	Information	Knowledge	Meaning	Philosophy	Wisdom	Union			
1. Performance Modes (Allee)	<i>Data</i>	<i>Procedural</i>	<i>Functional</i>	<i>Managing</i>	<i>Integrating</i>	<i>Renewing</i>	<i>Union</i>			
2. Five Disciplines (Peter Senge)				team learning	systems thinking & mental models	shared vision & personal mastery				
3. Knowledge Conversion Modes (Nonaka/Takeuchi)		operational knowledge	systemic knowledge	sympathized knowledge	conceptual knowledge					
4. Dimensions of Core Capabilities (Leonard-Barton)		physical systems	managerial systems		employee knowledge & skills (interfaces)	values & norms				
5. Managerial Focus (Erich Jantsch)		resources	tactical targets: products/services	social functions: roles/relationships	policy & systems dynamics	values				
6. Viable Systems (Stafford Beer)		system 1		system 2	system 3	system 4	system 5	environment		
7. Stratified Systems (Elliott Jacques)	1st order: linear stringing	2nd order: diagnostic accumulation	3rd order: alternate paths	4th order: multiple paths	5th order: unified whole systems	6th order: worldwide diagnostics	7th order: constructing whole systems			
8. Russell Ackoff	data	information (description)	knowledge (instruction)	understanding (explanation)		wisdom (evaluation)				
9. Quality Philosophy (Edward Deming)	data	action		knowledge (theory)	prediction	wisdom (question or judgment)				
10. Strategy Processes (S. Hart)		command	rational	transactional	generative	symbolic				
11. Hierarchy of Needs (Abraham Maslow)	physiological needs	safety needs (order)	belongingness needs	self-esteem needs	self-actualization needs	transcendence				
12. Moral Development (Lawrence Kohlberg)		obedience	instrumental relativist	conformity	law & order	social contract	universal ethics	cosmic		
13. Cognitive Development (Jean Piaget)	sensory motor	pre-conceptual	intuitive pre-operational	concrete operational	formal operational					
14. Theory of Process (Young)	potential	substance	form	combine/separation	self organization	mobility	dominion			
15. Yogic Philosophy (Chakra System)	1st - root material, food	2nd - sexual combination	3rd - hara power	4th - heart love, belonging	5th - throat expression	6th - third eye higher knowledge	7th - crown transcendence			
16. Levels of Consciousness (Ken Wilbur)	physical - non-living matter/energy	biological - living, sentient matter/energy	psychological mind, ego	psychological logic, thinking	subtle - archetypal, intuitive	causal formless radiance, transcendence	ultimate - consciousness as such			
17. Intuition Inspiral (Franquemont)	instinctual intuition	psychic intuition	creative intuition	archetypal intuition	visionary intuition	identification intuition	universal intuition			
18. Symbols (Allee)	Dot •	Cross +	Square □	Circle ○	Spiral •	Triangle ▽	Mobius ∞			

The Knowledge Archetype in Theoretical Constructs. (© Verna Allee 1994)

## APPENDIX 1

### The Knowledge Archetype in Theoretical Constructs

#### NOTES

1. Verna Allee, Performance Modes as described in Chapter 4.
2. Peter Senge, *The Fifth Discipline*. Senge suggests five disciplines for a learning organization: *personal mastery, mental models, shared vision, team learning, and systems thinking*. Systems thinking and explicit dialogue around concepts, assumptions, and beliefs is the focus of *Integrating* performance. Senge suggests supporting this work with a culture of team learning, which would address *Managing* issues. The wisdom aspects of his approach include personal mastery and shared vision, demonstrating a *Renewing* performance focus.
3. Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge-Creating Company*. In Chapter 3, "Theory of Knowledge Creation" (pp. 56-94), Nonaka and Takeuchi describe the modes of knowledge as four quadrants that are passed through in stages during the "knowledge spiral" process of knowledge creation. In their view, knowledge creation usually begins with socializing *Sympathized knowledge*, progressing next through externalized *Conceptual knowledge*. The cycle completes with the combination stage of *Systemic knowledge*, then knowledge is finally internalized once again as *Operational knowledge*.
4. Dorothy Leonard-Barton, *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*. See Chapter 1, "Core Capabilities," pp. 3-28. In her book, Leonard-Barton depicts a systemic approach to core technology competencies, drawn as a series of concentric circles with Physical Systems at the center and Values in the outermost circle. In dynamic, clockwise, circular movement around this knowledge "universe," she shows four key knowledge processes of *problem solving, implementing and integrating, experimenting, and importing knowledge*. This model depicts the more tangible "physical" aspects at the center, with the abstract components of knowledge, such as values, in the outer circle.
5. Erich Jantsch, *The Self-Organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution*, especially Chapter 16, "Ethics, Morality and System Management," pp. 263-274. In his classic work on self-organizing systems, Eric Jantz introduces the managerial focus framework in the context of strategic planning, demonstrating the different time horizons pertinent for each level of logic. This time-horizon aspect moves on a continuum from long-range for values and policy (system dynamics), to short-term for tactical targets. He also suggests that the management tasks are very different at each of these levels, since different types of logic are operative.
6. Stafford Beer, *Diagnosing the System for Organizations*. The viable system model includes five kinds of organizational context: System 1 - Production and delivery processes; System 2 - coordination of independent business units; System 3 - allocation of resources; System 4 - preparing and planning for the future; System 5 - identity of the whole (by ultimate decision makers). The viable systems model is also recursive, meaning that each of the parts is itself organized in the same way as the whole. Also defining the system is the *environment* in which it operates. Beer's model emphasizes communication and the flow of information according to the laws of cybernetics. He compares the organization of an enterprise system with an observation that the human nervous system is organized into five levels or neural structures, which process different types of information.
7. Elliot Jacques, *Requisite Organization: The CEO's Guide to Creative Structure and Leadership*. Jacques' description of the levels of complexity in organizations follows the archetype quite closely. In application, however, he suggests that "ownership" of a particular level should reside in a particular function. This way of organizing is typical in traditional bureaucracies. However, with the move to network organizations and self-managed teams, there is a trend toward shared responsibilities and cross-functional management. All tasks must be attended to, but not necessarily by confining responsibility to one person. He also explores the levels in relation to an expanding time dimension.

8. Russell Ackoff, in opening remarks at the GOAL/QPC annual conference in November of 1994 and in *The Democratic Corporation*. Ackoff proposes a continuum of knowledge where *data* are symbols that represent properties of objects or events, *information* is description, *knowledge* is the level of instruction, *understanding* is the explanation or “why” of certain events, and *wisdom* is the level of evaluation or judgement.
9. W. Edward Deming, in *Deming’s Road to Continual Improvement* by William W. Scherkenback (pp. 196-198), and as summarized by John H. Little in “Administrative Man Faces the Quality Transformation: Comparing the Ideas of Herbert A. Simon and W. Edward Deming,” *American Review of Public Administration* (pp. 67-85). Deming defined fourteen points or practices to develop “profound knowledge,” which comprise four interrelated parts: (1) appreciation for a system; (2) knowledge about variation; (3) theory of knowledge; (4) psychology of individuals, society, and change.

By *systems* Deming means the configuration of people, materials, methods, and equipment working in support of each other. Understanding *variation* is key to quality and consistency in output. A theory of *psychology* is for the purpose of understanding change. A theory of *knowledge* means understanding the operating principles or theory underlying the action. Deming’s theory of knowledge is often described as the Plan, Do, Check, Act cycle.

A synthesis and integration of Deming’s theory of knowledge and the Allee Learning and Performance framework is further explored and developed by Kathryn Alexander, *Holistic Knowing*, an unpublished manuscript.

10. Stuart L. Hart, “An Integrative Framework for Strategy-Making Processes,” *Academy of Management Review*, pp. 327-351. Hart’s analysis suggests that different modalities are appropriate in different environmental contexts. He views strategy making as an organization-wide phenomenon, emphasizing the complementary roles between top managers and organizational members.
11. Abraham Maslow, *Toward A Psychology of Being, 2nd Edition*. The usual depiction of Maslow’s hierarchy of needs is in pyramid form, with physio-biological needs forming the base and self-actualization serving as the top. Maslow’s later work, however, emphasizes “peak experiences” and defines health as transcendence of the environment. With these distinctions, the pyramid is sometimes depicted with a “capstone” of transcendence as the highest need of the human psyche. Given the overall unitary consciousness of his work, I believe this is an appropriate enhancement.
12. Lawrence Kohlberg’s stages of moral development have been verified in many international and cross-cultural studies. In his later work, “Stages and Aging in Moral Development: Some Speculations,” *Gerontologist*, pp. 497-502, Kohlberg proposes a seventh adult stage that apparently unfolds in some, but not all, individuals later in life and involves adoption of a religious and cosmic perspective. Kohlberg’s stages are “hierarchical integrations,” where thinking at a higher stage includes or comprehends within it lower-stage thinking. His model is also developmental, in that movement is always to the next stage up, except in conditions of extreme trauma.
13. Jean Piaget, as described by Ruth M. Beard in *An Outline of Piaget’s Developmental Psychology*. Piaget’s developmental psychology has been foundational in Western cognitive science. One of the limitations of his groundbreaking work is that most of his developmental studies were conducted on male children. As Carol Gilligan has pointed out in *A Different Voice*, this has led to a “blind spot” in developmental psychology regarding the higher relationship identification skills of female children. This may be why Piaget did not go further in identifying more abstract thinking skills, such as the ability to discern dynamic relationships, which is vital for systems thinking.

14. Arthur Young, *The Reflexive Universe: Evolution of Consciousness*. Aside from his early work on the development of the helicopter, one of Arthur Young's enduring contributions to thought is a theory of process that integrates data from a variety of disciplines. The underlying process that most intrigues him is how form comes in and out of being, and how we might understand different life forms from an evolutionary perspective. His approach is recursive, suggesting that each stage is itself a microcosm of all the stages of process.
15. There are many sources available on the chakras and their correlating domains of intelligence. I especially recommend Rolf von Eckartsberg's "Maps of the Mind: The Cartography of Consciousness," in *The Metaphors of Consciousness*, Ronald S. Valle and Rolf von Eckartsberg, eds. Von Eckartsberg's synthesis of Eastern and Western psychology is exceptionally clear and straightforward. His integrative model of the human "psychocosm" is remarkable for its integration of depth psychology and modalities of thought and consciousness. The chakra system has been in use for over 2,000 years and has a rich heritage. Each of the energy centers and domains of consciousness is also associated with a particular color of the spectrum. Out of respect for this ancient system, I use the traditional chakra colors when depicting the modes of knowing. Corresponding colors would be Data - Red, Information - Orange, Knowledge - Yellow, Meaning - Green, Philosophy - Light Blue, Wisdom - Dark Blue or Indigo, Union - Violet or Purple.
16. Ken Wilber, *The Atman Project*. Wilber is a distinguished scholar in the field of transpersonal psychology. His analysis of Eastern and Western psychological approaches is unique in the breadth of his scholarship and the clarity and depth of his thinking. He is also interested in the evolutionary process of human development and has published many books on personal and social development. *The Atman Project* most clearly articulates his thinking in psychological development.
17. Sharon Franquemont, *You Already Know What to Do*. Franquemont's work on intuition spans more than twenty years of research and practice. Her work is cross-cultural, drawing from a variety of disciplines and world philosophies. The first two intuitive modes, the *instinctual* and *psychic*, deal with data and information at the physical and emotional levels respectively. *Creative* intuition is a more cognitive intuitive level involving independent action. *Archetypal* intuition is the realm of metaphor, story, and context. *Visionary* intuition incorporates the integrative aspect of seeing the pathways to accomplish the vision, as well as defining the vision itself. *Identification* intuition describes value-related intuitive experiences involving communal connections, while *Universal* intuition is the experience of connectedness with the ultimate. A frequent response to the knowledge archetype is to ask, "Where is intuition?" Franquemont's work demonstrates that if intuition is anywhere, it is everywhere. Each of the modes of knowledge embraces both analytical and intuitive aspects of knowing.
18. Symbolic systems that relate to intelligence or consciousness are not as common as word-based systems, yet there are a few that would be interesting to explore further. The symbols described here are based on the work of Angeles Arrien, a cross-cultural anthropologist who has researched symbolic systems from a variety of world cultures. She is the author of several books on symbolic systems. In *Signs of Life* she describes the orientation and application of five universal symbols: the square, cross, circle, triangle, and spiral. The dot and the mobius are suggested here as an extension of this symbolic system.
19. A special note regarding multiple intelligences theory. The above comparison does not include the multiple intelligences typology of Howard Gardner described in *Frames of Mind: The Theory of Multiple Intelligences*, and in *Multiple Intelligences: The Theory in Practice*. The cognitive aspects addressed by Howard Gardner are quite different from those authors I have selected for comparison. Gardner's studies of intelligences explore underlying cognitive processes that support reason and understanding at every level of complexity. His work has contributed enormously to an understanding of adult learning modes, and fostered appreciation for previously ignored cognitive skills.

For example, one of the intelligences that Gardner identifies is musical intelligence. This is a very large category of processes that include appreciation of rhythm, melody, structure, harmony, interval or relationships, and a host of other aspects of sound and rhythm. These sensitivities are critical for any thought process, even though individuals may vary in degree of mastery. The other intelligences he identifies are bodily-kinesthetic, logical-mathematical, linguistic, spatial, interpersonal, and intrapersonal. Each of these "intelligences" is actually a form of cognitive processing that helps us deal with complexity at multiple task levels. All are relevant to business performance. For example, Charles Savage, in *5th Generation Management: Co-creating Through Virtual Enterprising, Dynamic Teaming, and Knowledge Networking* (pp. 219-229), describes the use of musical intelligence in business planning and decision-making.

Peter Koestenbaum, in *The Heart of Business: Ethics, Power and Philosophy*, takes a similar approach to that of Gardner in exploring multiple organizational intelligences. He identifies logical, somatic, aesthetic, transcendental, marketing, motivational, wisdom, and team intelligences that are operative in organizations. Although his approach to organizational intelligence is different from the archetype presented here, his thoughtful and insightful exploration of organizational intelligence is a landmark work. He addresses difficult questions of ethics, morals, and spirit in a work environment. Neither Gardner nor Koestenbaum define their intelligences on a continuum of increasing complexity. Since they themselves did not undertake to order intelligence in this way, I have not included them in my comparative analysis.

Also quite interesting and relevant to the exploration of this archetype is the work of Gareth Morgan in *Images of the Organization*. Morgan's study of organizational theory describes several discrete metaphors. These metaphors appear to correspond to the knowledge archetypes, but the relationships are not as clear cut as others in the table. The metaphors and models he describes are machine, organism, brain, political system or culture, and organizations as flux and change.