The Roots of Collaborative Innovation

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Abstract
This article follows Charlie Smith's kind request to address Buckminster Fuller's question from which he created his extraordinary inventive technical and social inventions and projects: "At this extraordinary time of social, political and economic disintegration, with respect to Collaborative Innovation, What is the most important question we can ask, and why?" The author's answer to this question comes from the central question of life and leadership with respect to Collaborative Innovation: "What choice can I make and action can I take, in this moment, to create the greatest net value to share with?" In Collaborative Innovation each individual shares his/her own worldview. Therefore collective intelligence overcome individual limitations into common wellbeing. In the following sections the author addresses the issues of human worldview, social theory, values, and creativity, under the essence of Buckminster Fuller's rationale, to elucidate human applied, narrative, and language logic to explain why.

1. Introduction

Usually, innovation is often conflated with strategy. Strategy, after all is a coherent and substantiated logic for making choices, while innovation is a messy business which creates novel solutions to important problems. Put simply, strategy is about achieving objectives, while innovation is about discovery, we never know exactly where we are going until we get there. In other words, while strategy creates a clear path to a goal, innovation is often started with a confused approach.

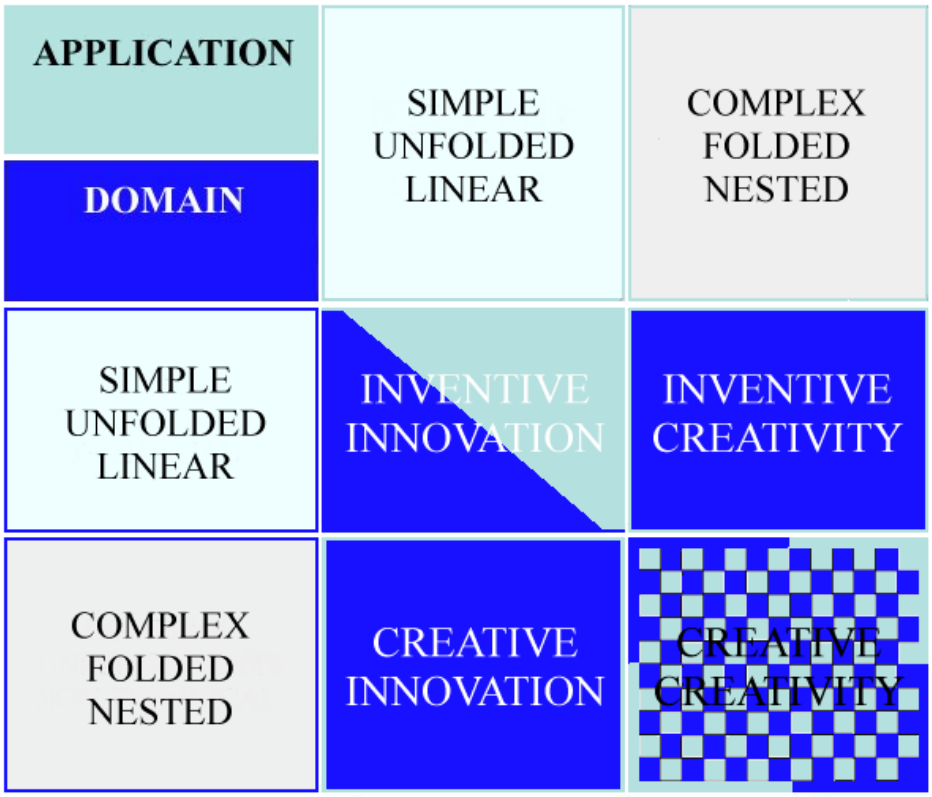
What is innovation then? As a matter of fact, currently innovation means different things to different people. It ultimately is what you think it is. What is a useful definition for you will not work for others, and vice versa. For instance, American business researcher Hutch Carpenter wrote a post outlining 25 different definitions of innovation in 2010 (Carpenter, 2010). He breaks the definitions down into five sub-categories, which all reflect slightly different takes on the nature of innovation. More recently, American business researcher Tim Kastelle defines innovation as "executing new ideas to create value" (Kastelle, 2011). The point is that different types of innovation require different strategic approaches.

Defining a managerial approach to innovation and creativity, we need a clear reference for framing innovation and creativity problems and approaches that are most likely to resolve them. Here, we can apply the Computational Information Conservation Theory (CICT) framework, developed for "Application" and "Domain" definitions as the two sides of the same coin, where Application (the problem) is Innovation and Domain is Creativity in this case (Fiorini, 1994, 2017a). As usual we start from an ill-posed problem to arrive to a well-posed problem (Hadamard, 1902) through a regularization procedure. It starts with developing a better understanding of the problem we need to solve.

Asking two basic questions can be enormously helpful. The first one is "How well is the Application (the problem) defined?"; and the second one is "Who is best-placed to solve it?" But, sometimes the proper Domain is not so cut and dried. Once you start asking these questions, you will find that they clarify the issues quite quickly. Either there is a simple answer, or there is not. Once we have asked the framing questions, we can determine which approach to Innovation makes the most sense, obtaining, from our usual four quadrant scheme, four fundamental reference categories: Inventive Innovation, Inventive Creativity, Creative Innovation, and Creative Creativity as depicted in Figure 1.

As a matter of fact, in the process of providing innovative results, many organizations have been able to examine a variety of models for their transactional and transformational effectiveness in the past decades. Their most outstanding results have been achieved when collaboration and innovation have both been applied simultaneously. This synergy, labeled "Collaborative Innovation" (CI), is so powerful that it often leads to technical, economic and organizational breakthroughs. While those organizations know that CI works, they still do not understand exactly why it works so well, how to maximize its effectiveness and how to broaden its application. Their goal over the next few years is to do just that. This article is the author humble contribution to deep dive into the core of successful CI and explore breakthroughs beyond what already seems possible.

Figure 1: Four-Quadrant Scheme for "Application" definition and "Domain" definition, where Application is Innovation and Domain is Creativity (see text).



2. Human Worldview, Social Theory, Values, and Creativity

Mankind's best conceivable worldview is at most a representation, a partial picture of the real world, an interpretation centered on man. We inevitably see the universe from an individual human point of view and communicate in terms shaped by the exigencies of human life in a natural uncertain environment perceived from single individual by articulated signs. The discovery of Nature as a reality prior to and in many ways escaping human purposes begins from the story even of the sign.

The story of the sign, in short, is of a piece within the story of philosophy itself, and begins, all unknowingly, where philosophy itself begins, though not as philosophy. Even if we do not have to explore every theme of that history, we must yet explain all those themes that pertain to the presupposition of the sign's being and activity, in order to arrive at that being and activity with sufficient intellectual tools to make full sense of it as a theme in its own right. And those themes turn out to be nothing less or other than the very themes of ontology, epistemology, and axiology forged presemiotically, as we might say, in that laboratory for discovering the consequences of ideas that we call the history of philosophy (Deely, 2001, pp.19-20).

Knowledge is based on perceptual states that are initially non-doxastic seemings. They turn into beliefs under reflection and full endorsement (Audi, 2002; Roberts, 2003). The extension of the elementary meaning-making process allow ancestors construe, understand, or make sense of life events, the self, and relationships (Ignelzi, 2000). Then they discover that their sign can be used backwards as symbols referring to their meaning (inverse modelling or analysis phase). They can be "grounded" to their meaning. But symbol grounding is also an important problem in studying foundation of cognition such as the evolution of language, as human language is primarily symbolic (Deacon, 1997). Through meaning-making symbols, individuals are "retaining, reaffirming, revising, or replacing elements of their orienting system to develop more nuanced, complex and useful systems" (Gillies et al., 2014). The concept of telling stories with pictures can be traced back to ancient era.

Quite often, from an individual perspective, external events seem to be an entirely random series of happenings. But looked at over a long period of time by many individuals, and tracking, and sharing the branching changes in the planet that follow from it, all the chaos does produce a form of identifiable order. Patterns will appear out of the chaos. And this, in its essence, is chaos theory: finding order in the chaos (Wheatley, 2006). "Chaos Theory" falls into that category of scientific ideas that few actually understand but many have heard of, due to its expansive, epic-sounding principles and thoughts. Inherent to the theory is the idea that extremely small changes produce enormous effects, but ones that can only be described fully in retrospect. Why?

The fundamental reason is more evident in social systems. In social systems any individual signal is actually small, weak, never strong. Weak signals are "the real foundation of the whole society" (Ansoff, 1975; Poli, 2013). Accurate prediction is somewhat impossible and it is known that the occurrence of extreme events cannot be predicted from past history records (Taleb, 2015). All human beings have similar sensorimotor interfaces and learn basic sensorimotor tasks which provide the common ground resonances for developing social communication within their natural environments. When men discover the advantage of creating little communities to learn an easier surviving by exchanging experiences and sharing time, then they become aware of the importance and the convenience of communicating meaning by sign. In itself, the concept of

"shared time" is nothing but a notion enclosing an illusory idea (Eidon) devised by the thinking mind to keep track of history self-forming a culture. Personal cyclical time becomes translated into shared sequential time (Chronos). Ideas, as entities gravitating above the human tier, related by virtue of meanings and encapsulated in signs interconnected by subtle underlying relations, are defining and enclosing their shadows wanting for light, in their physical and metaphysical meanings, bearings, senses and acceptations. Signs and their relational systems start forming a necessary precondition for all communication practice. The shared, living sign is begetting its language by the unified toil of resonant perception and action, by the active contemplation between the shams of the inner, and the pretenses of the outer, still dwelling in the duality of the resonant cycle of tuned action and perception. If the discovery of the sign began, as a matter of fact, unconsciously with the discovery of Nature, then the beginning of semiotics was first the beginning of philosophy, for only as philosophy are the foundations of semiotics possible, even if semiotics is what philosophy must eventually become (Fiorini, 2019a).

There is something fundamental to learn from the brain and biology about new and much more effective forms of processing and computation to develop more effective intelligent systems. The traditional human means of new knowledge is reason, Rational Thinking (RT), the use of order and logic to learn and prosper. Today, human beings realize that, at the same time, they need Emotional Intelligence (EI) and Emotional Creativity (EC) (Goleman, 1995), and the use of open logic and reframing, to create and survive. EI and EC coexist at the same time with RT, sharing the same input environment. Human beings use both Logical Aperture (to get EI and EC, to create and survive) and Logical Closure (to get Rational Thinking, to learn and prosper), both fed by environmental "noise" (or perhaps better, by what human beings call "noise") (Fiorini, 2014a).

The basic idea of a System Theory (ST) in social science is to solve the classic problem of duality; mind-body, subject-object, form-content, signifier-signified, and structure-agency. ST, therefore, suggests that instead of creating closed categories into binaries (subject-object); the system should stay open so as to allow free flow of process and interactions. In this way the binaries are dissolved. One of the central elements of ST is to move away from the representational system to the non-representation of things. What it means that instead of creating and imposing asymptotic, abstract, mental concepts, which reduce complexity of a materiality by limiting the variations or malleability onto the objects, one should trace the related Network of Things (NoT). The tracing rather than projecting mental images bring in sight material reality that has been obscured under the universalizing concepts of the past. This perspective opens the door to Actor-Network Theory (ANT) immediately. ANT is a theoretical and methodological approach to social theory where everything in the social and natural worlds exists in constantly shifting networks of relationship. The fundamental aim of ANT is to explore how networks are built or assembled and maintained to achieve a specific objective (Law & Hassard, 1999; Latour, 2005; Yaneva, 2009; Carroll, 2014).

The human mind-brain has a genetic disposition and desire to create value. The more value you can create the more success and happiness you can achieve (TRIIWT, 2019). For instance, we have to remember the Hawthorne studies which were conducted on workers at the Hawthorne plant of the Western Electric Company by Elton Mayo and Fritz Roethlisberger in the 1920s. The Hawthorne studies were part of a refocus on managerial strategy incorporating the socio-psychological aspects of human behavior in organizations. The Hawthorne studies showed that people's work performance is dependent on social issues and job satisfaction, and that monetary

incentives and good working conditions are generally less important in improving employee productivity than meeting individuals' need and desire to belong to a group and be included in decision making and work (Busse & Warner, 2017). One might argue that, although there is no proof of a Hawthorne effect in the original studies, it does not mean that there is no such thing as a Hawthorne effect. However, few people will disagree with the fact that human beings, both in every-day life and when part of a scientific investigation, "reflect upon their situation and react to it when they consider this appropriate" (Wickström & Bendix, 2000).

The most important thing for all of us to determine: "What is a human being?" We define a human being as the only thing in the world that has its own definition of itself in itself. By the simple definition of a human being as self-reflective organism it appears as an infinity. I can never completely reach myself as thinking. The peculiar thing is that in one of the first mathematical treatises on infinity German mathematician Richard Dedekind (b.1831–d.1916), 1887, used this example to prove the existence of infinite systems. The American philosopher Josiah Royce (b.1855–d.1916), twelve years later, turned around Dedekind's proof in order to prove the infinity of the human being. The human being, axiologically, is an actual infinity. Moreover, he is a non-denumerable infinity: for what is true of him and himself is true of any thought he/she may have (Hartmann & Weiss, 1967). Since a non-denumerable infinity is intrinsic value, the human being is an intrinsic or final value, according to German-American logician and philosopher Robert S. Hartman (b.1910–d.1973) (Hartmann, 1967). Also, a person can define himself extrinsically, as a member of some class. When we define human being systemically, we put up a system, we construct a formal representation, something as an individual which he/she is not at all. Formal axiology is the subdiscipline of moral philosophy that deals with structural and conceptual issues about value and value concepts (Olson, 2005; Thompson, 2010; Prat-i-Pubill, 2018).

Therefore, by formal axiology, we can upgrade the meaning of a living organism from systemic, through extrinsic, till intrinsic or final value. Nevertheless, while value is a subjective judgment in our minds, in nature the relative value of all things (tangible and intangible) is concrete and shareable. As a matter of fact, human values express intention and commitment, but they are not merely utopian ideals or ethical principles. They represent the highest abstract mental formulations of life principles with immense power for practical accomplishment. They represent the quintessence of humanity's acquired wisdom as society, regarding the necessary foundations for human survival, growth, development and evolution. They can transform intangibles into tangibles (Jacobs et al., 2018; Fiorini, 2019a).

From Systems Theory, basic dynamical concepts relevant to human creativity include those of stability, instability, bifurcations, and self-organization. Most creative bifurcations result from chaotic attractors to chaotic attractors, and such bifurcations are macro-bifurcations, comprised of a cascade of micro-bifurcations, whether in continuous dynamics or network-style models. For instance, at a higher level of abstraction, environmental noise input information which needs to be aggregated into system internal status information can provide a structured homeodynamic synthetic operating flow as a reference for further inquiry (Csikszentmihalyi, 1997). Then, system interaction by internal and external information aggregation can allow both quick and raw response (Open Logic response, to create and survive) and slow and accurate information processing for articulated, future response strategic organization (Closed Logic response, to learn and prosper), by coherently formatted operating point information (Fiorini, 2016).

As a matter of fact, you take points in the system and apply them to points in the chaos, and the order between points in the system is the order between the points in the chaos. On this relationship between a formal representation system and phenomenal chaos is based all scientific definition. The minute a ray of light was defined by asymtotic abstraction as a straight line, the science of optics was born: the system of geometry could be used to account for rays of light, for "straight line" is a notion in the system of geometry. In this way, an asymptotic abstration is applied to the real world, as usual for reductionist, traditional science. Thus, a traditional science is a combination of a formal system, whether it be mathematics in physics or theory of harmony in music or axiology in value, to a chaotic set of phenomena, be they natural phenomena or musical sounds or value situations. So today we have the following view of current science. You have the various natural sciences which are ordered by mathematics, namely physics, chemistry, astronomy, and so on, each applied to a set of natural situations. For example, a situation such as a bicyclist bicycling, is ordered by the science of physics, which is ordered by mathematics and mathematics is itself ordered by logic; so that in the last instance the mechanical situation is ordered by logic with specific discipline labels. And different labels define different knowledge silos. Unfortunately silos are good for grain, not for brain. As a matter of fact, all natural science is, in the last instance, applied logic only (Fiorini, 2017a).

3. The Essence of Buckminster Fuller Rationale

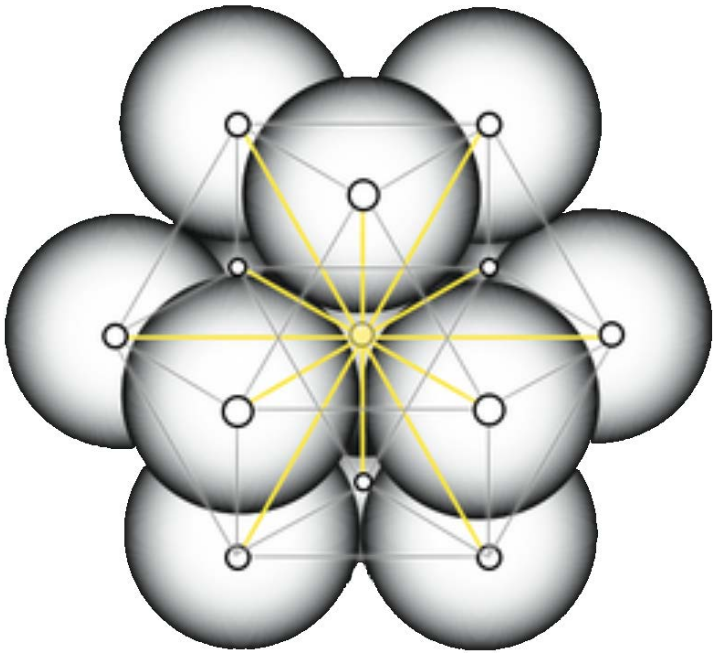
The CubOctaHedron (COH) is at the center of American architect and systems theorist Richard Buckminster Fuller's (b.1895–d.1983) synergetic philosophy in architecture. Fuller applied the name "Dymaxion" to this shape, along with "Vector Equilibrium" (VE), meaning the dynamic balance of tensional cosmic forces. Unlike Cartesian coordinate system, it can strikingly be developed around one nuclear central sphere, as reported in Figure 2 (Fuller, 1975/1997; 1982).

In geometry, COH is named thusly because it is simply an intersection of a cube and an octahedron, as represented in the "Crystal" by M.C. Escher in 1947 (Loeb, 1986). A COH is a polyhedron with 8 triangular faces and 6 square faces. Connecting the centers of the external 12 spheres gives a COH (Figure 2) (Steinhaus, 1999). A COH has 12 identical vertices, with 2 triangles and 2 squares meeting at each, and 24 identical edges, each separating a triangle from a square. As such, it is a quasi-regular polyhedron, i.e. an Archimedean solid that is not only vertex-transitive but also edge-transitive. The VE, as its name describes, is the only geometric form wherein all of the vectors are of equal length. This includes both the semidiagonals from its center point out to its circumferential vertices, and the edges (vectors) connecting all of those vertices (Figure 2). It was Buckminster Fuller who discovered the significance of the full vector symmetry in 1917 and called it the "Vector Equilibrium" in 1940. VE represents the ultimate and perfect condition, wherein the movement of energy comes to a state of absolute equilibrium, and therefore absolute stillness and nothingness. The closest packing (positioning) of spheres (wave fronts) is organized in all of nature as a VE that is also the underlying "tensegral" form of the energetic "Torus," the core recurring pattern, "donut shaped energy vortex," that evolves life at every scale. As Fuller states: "The vector equilibrium nucleus of the isotropic vector matrix is the zero starting point for happenings or nonhappenings: it is the empty theater and empty Universe intercoordinatingly ready to accommodate any act and any audience" (Fuller, 1975/1997, Sec. 503.031).

In other words VE is the zero-phase from which all other forms emerge (as well as all dynamic energy events). The most fundamental aspect of the VE to understand is that, being a geometry

of absolute equilibrium wherein all fluctuation (and therefore differential) ceases, it is conceptually the geometry of what can be called the "zero-point" or "Unified Field," also called the "vacuum of space". In cubic close packing of equal spheres, each sphere is surrounded by 12 other spheres. Taking a collection of 13 such spheres gives the fundamental elementary cluster (Figure 2). Equilibrium of this kind is also called "isotropic vector matrix" (IVM), as an omnidirectional closest packing around a nucleus about which omnidirectional concentric closest packing of equal spheres form series of vector equilibria of progressively higher frequencies (Fuller, 1982). For latest information on Fuller legacy the reader is referred to the Buckminster Fuller Institute (BFI, 2019).

Figure 2. Vector Equilibrium by using one sphere as the center point. We can then pack twelve spheres around this "nucleus" sphere (see text)



4. CICT Understanding of Buckminster Fuller Rationale

The first appearance of COH is in the book titled "Archimedean Solids", where Pappus of Alexandria lists solids, which he attributes to Archimedes in his Book V of his Collections, though Archimedes makes no mention of these solids in any of his works (Pappus, 2016). Long after, it reappears in Luca Pacioli's book *De divina proportione* written around 1497, where all figures are drawn by Leonardo da Vinci (Pacioli, 1982). Johannes Kepler (1571-1630) rediscovered the 13 Archimedean solids and gave the first surviving proof that there are only 13. In Japan, cuboctahedra have been widely used as decorations in furniture and buildings. Lamps in the shape of cuboctahedra were used in Japan already in the 1200s, and they are still used today in certain religious ceremonies in memory of the dead (Miyazaki, 1993).

COH is the ideal state of the IVM and the IVM is formed by filling all space with cuboctahedra recursively. Remembering Richard Buckminster Fuller: "Any polygon with more than three

sides is unstable. Only the triangle is inherently stable. Any polyhedron bounded by polygonal faces with more than three sides is unstable. Only polyhedra bounded by triangular faces are inherently stable" (Fuller, 1975/1997). Furthermore: "There are only three possible cases of fundamental omnisymmetrical, omnitriangulated, least-effort structural systems in nature: the tetrahedron with three triangles at each vertex, the octahedron with four triangles at each vertex, and the icosahedron with five triangles at each vertex. If there are six equilateral triangles around a vertex we cannot define a three-dimensional structural system, only a plane" (Fuller, 1975/1997). Eventually: "Omnitriangulated geodesic spheres consisting exclusively of three-way interacting great circles are realizations of gravitational field patterns. The gravitational field will ultimately be disclosed as ultra high-frequency tensegrity geodesic spheres. Nothing else", according to the "Three Way Grid" (OAC, 2019).

While in a VE state, there are 12 radials extending to other points in the matrix along spatial dimensions (Figure 2). The points are intersections of energy, bridging dimensions. Each point in the lattice may fluctuate as energy passes through it, as vibration travels through these dimensional radials. The state of a point or intersection at any given moment is determined by the combination of vibrations moving through it. Each structural intersection is not only a position, but also resonates at a specific frequency. In this way, even the Planck scale structure of space-time is not a static and rigid system, but is flexible and acts in accordance with the properties of waveforms and fluid dynamics.

Energy will always attempt to reach an equilibrium state, so the dynamics at quantum scale are in a constant flux, working to return balance to the fundamental fabric. Each change that precipitates this "returning" ripples through the fabric, and can be seen from microcosmic to macrocosmic scales. At the quantum scale, gravity can be seen to arise from geometric permutations of the quantum field. Nearly every point in spacetime is part of a larger gravity well. Consider that we are currently in the gravity well of the Earth, Moon, Sun, Galaxy, Laniakea Cluster, and whatever larger gravitational structures exist in the Universe. The "architecture" of the quantum field must be in extremely high equilibrium, suggesting a tetrahedral packing mechanism, which Buckminster Fuller often described as the "building blocks of the Universe."

Physicist Nassim Haramein in his "Unified Field Theory" approach suggests that the structure of spacetime has a COH VE at its core (Haramein et al., 2008; Haramein, 2013). In Haramein's theory, each node in the geodesic (or point on the tetrahedron grid) is a Planck Spherical Unit. These spheres are interlocking and intersecting, space-filling. However, intersecting spheres follow the same rules as tetrahedral grids (or hexagonal grids), and so the same fundamental geometry of spacetime arises in either case. According to Haramein’s theory, the structure can be seen in the close-packed hexagonal cells of honeycombs and bubbles, boiling water, and the storms on gas giants (Haramein, 2013). The COH geometry is at the root of our emerging reality.

Based on the CICT perspective, the emerging reality is that we live in a relational reality. What does that mean? It means that the properties of the biosphere around us stem not only from properties of its ultimate building blocks, but from the relations among these building blocks too. Self-organization is an obvious principle which is embedded in our description of the universe. CICT is a precision driven, pre-spatial geometro-arithmetic framework for open system (Fiorini, 2014b, 2017b).

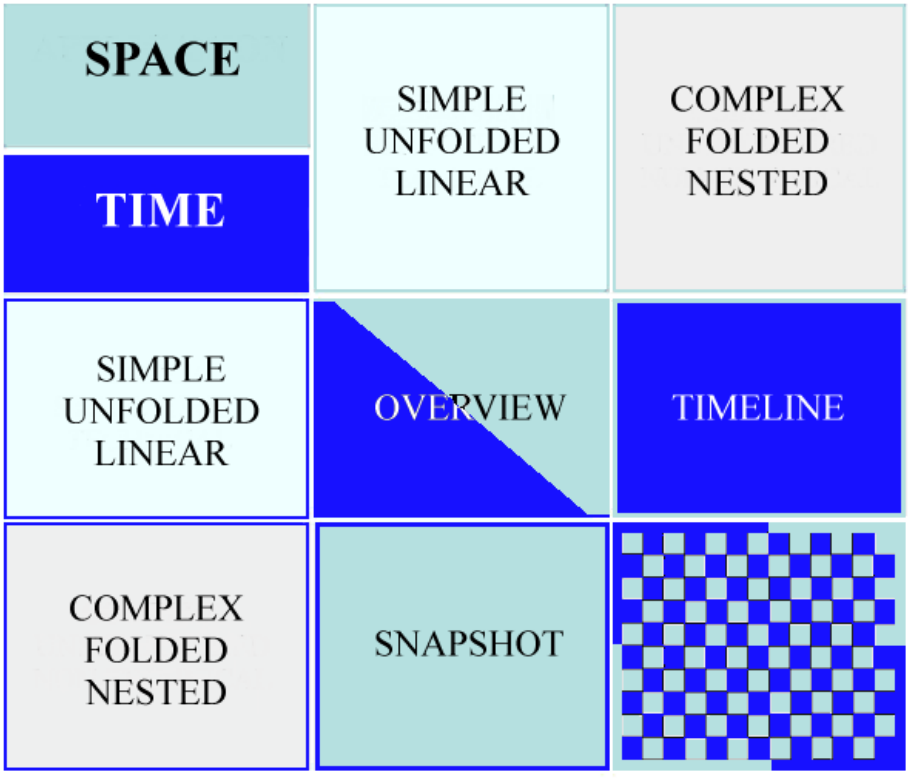
According to CICT, the full information content of any symbolic representation emerges from the capture of two fundamental coupled components: the linear one (unfolded, associated to external representation) and the nonlinear one (folded, associated to internal representation). From a common language perspective, taking into consideration the folding and unfolding properties of CICT structured "OpeRational" (OR) representations for the Space-Time Split (STS) (Fiorini, 2015), one can conceive a better operative understanding of usual terms, with the added possibility of information conservation as shown in "The Four Quadrants of The Space-Time Split" (Figure 3) through a narrative point of view (Fiorini, 2014a).

Here, the term "Timeline" (first quadrant, top right) is considered the combination of a major linear time representation framed by folded minor space representation.

The term "Overview" (second quadrant, top left) is interpreted as the combined representation of major linear space and major linear time representations, with minor complementary folded time and space components.

The term "Snapshot" (third quadrant, bottom left) can be assumed as the combination of a major linear space representation framed by the minor folded time representation.

Figure 3. The Four Quadrants of the Human Space-Time Split (STS)



The forth quadrant (bottom right) represents the combination of major folded space and time components, framed by the combination of minor linear space and time components. It can be interpreted as a simple (bidimensional), but realistic representation of the usual information

experienced by a living organism. In other words, by the use of CICT, to capture the full information content of any elementary symbolic representation, it is necessary to conceive a "quadratic support space" at least.

Of course, we can apply our non-dual dichotomizing process in a recursive way to achieve any precision we like. In this case the COH is able to capture the corresponding non-linear, internal representation (multiplicative group) associated to any linear, external representation (additive group). Therefore, to get maximum information conservation by any information processing task, we need to take into consideration the linear representation and the non-linear one jointly. For the linear, external representation, we can use the Demey and Smessaert's approach for *n*-dimensional duality in Logic and Language (Demey & Smessaert, 2014; Smessaert & Demey, 2015).

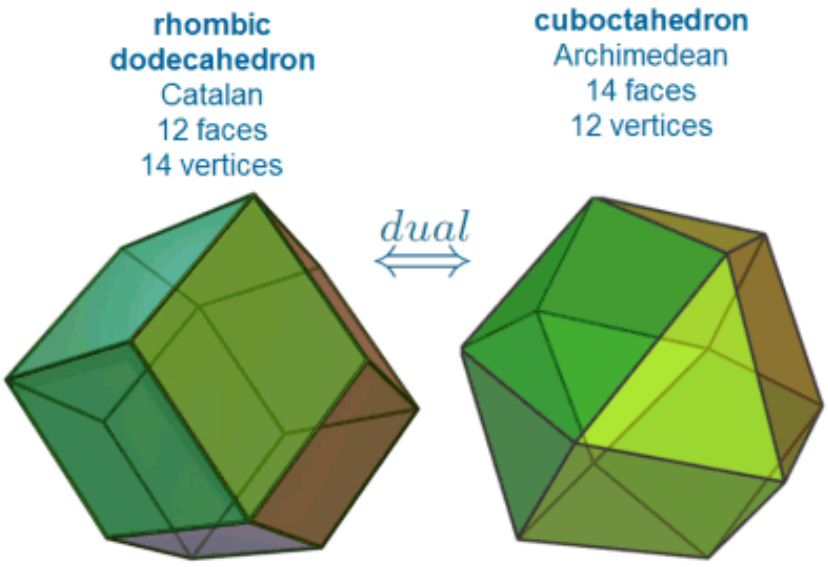
As a matter of fact, our external representation logic can be based on two asymptotic "pure", irreducible, dual *n*-geometric subsystems:

A) (NOG) n-HypercCube:
N-Opposition Geometry, N-Opposition Relations: Being True/False Together.

B) (NIG) n-HyperOctahedron:
N-Implication Geometry, N-Implication Relations: Truth Propagation.

The use the Demey & Smessaert's approach refers to the Rombic Dodecahedron (RDH) geometry at the core of their narrative, and language logic. In this case, it can be showed that COH can be considered the geometric reciprocal of the RDH, as reported in Figure 4. The COH can be inscribed in the RDH and vice versa (Steinhaus, 1999, pp. 203-205). The centers of the square faces determine an octahedron (Ball & Coxeter, 1987, p. 137).

Figure 4. Complete Duality of Opposition and Implication Geometry in Logical Geometry and Language (see text)



5. Conclusion

"Horror Vacui" and "Horror Pleni" are two cosmic, fundamental concepts referring to humans' intellectual operative range, related to Eastern philosophies based on "Nothingness" as the fundamental state (He et al., 2014; Freitas, 2018) and Western philosophies centered on "Being" as the fundament of reality, respectively. The non-dual binary modality of the thinking mind to perceive reality in complementary terms is the sole means to make sense of a seemingly incoherent whole, unfitted to be grasped in its entirety by a twofold device. A "non-dual dichotomy" permeating the human representation of living creatures is the elementary base to start with any more refined conceptual description (Fiorini, 2018a). Their deep meaning can be translated and extended to many different human disciplined areas like art, literature, sociology, science, etc... This daydream of cosmic non-dual dichotomies embedded in wherever slant of the creation, of context and scale, is epitomised in the continuous human attempt to perceive the reality beyond its opaque veil, offered by the statistical representation of current science.

Human approach to experience is based on making decision in a natural uncertain environment by incomplete knowledge. When individuals make decisions, their rationality is limited by the tractability of the decision problem, the cognitive limitations of their minds, and the time available to make the decision. Decision-makers in this view act as satisficers, seeking a satisfactory solution rather than an optimal one. American economist and political scientist Herbert A. Simon proposed "bounded rationality" as an alternative basis for the mathematical modelling of decision-making, as used in economics, political science and related disciplines. It complements "rationality as optimization", which views decision-making as a fully rational process of finding an optimal choice given the information available. The theory of bounded rationality, developed by Simon is goal-oriented and takes into consideration the cognitive limitations of decision makers in accomplishing their goals (Simon, 1981, 1982).

For instance, when engaged in problem solving, human beings' decision-making process is constrained by the following at least:

(1) the knowledge or information they possess,
(2) the cognitive limitations they have, and
(3) the time limit within which a decision needs to be made (Russell & Norvig, 2010).

As a result, the human decision-making process in practice really consists in a search through a finite number of options, the fewer the better. People tend to identify with sub-goals rather than with global aims, exploit pre-existing structures or regularities in the environment, apply approximate or heuristic approaches to problems, and be content with good enough solutions. Moreover, the stochastic vs. combinatorically optimized noise generation ambiguity emphasizes the traditional major IDB problem (Fiorini, 2014a) in current most advanced instrumentation system, still at the inner core of human knowledge extraction by experimentation in science (Fiorini, 2017a).
Therefore, to grasp a more reliable, effective representation of reality and to get more realistic physical and biological simulation techniques, differently from the past, researchers and scientists need two intelligently articulated hands: both stochastic and combinatorical approaches synergistically articulated by natural coupling (Fiorini, 2017c).

It is time to recall Einstein's inspirational quote: "The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honors the servant and has forgotten the gift." It is time to start a new era on the deep awareness of the original configuration! Present planetary problems are the legacy of multiscale-order deficiencies from the past, obsolete, Western, human reductionist worldview. They cannot be fixed by the usual, traditional, hierarchical approach alone, by doing what we do better or more intensely, but rather by changing the way we do, the way we understand the deep meaning of data and information. We need "New Eyes" to find innovative solutions to old problems (Fiorini, 2018a, 2018b, 2019b).

Today the ever accelerating progress of technology and changes in the mode of human life give the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue. It may well be that we are approaching the end of one of those cycles and need to prepare for a more significant reframing of the basis for information, knowledge and civilization in the age to come, starting from the bottom and going up.

At a more practical level, we, the children of the Anthropocene Era (Crutzen & Stoermer, 2016), are entering the Fourth Industrial Revolution (FIR) and the impact is going to be pervasive and of greater magnitude compared to the previous industrial revolutions. The FIR builds on the current Digital Revolution, representing new ways in which technology becomes embedded within societies and even the human body. The FIR is not a natural event, but a metaphor which has been constructed by German engineer and economist Klaus Schwab (Schwab, 2015) and others on the basis of earlier "Industrial Revolutions." In the past decades, we all learned how traditional human-made system can be quite fragile to unexpected combined perturbations (e.g. Fukushima on March 11, 2011), because the traditional statistic approach of risk management by itself can fool you, unfortunately (Taleb, 2015). We need a new, definitive and antifragile solution to the problem of the logical relationship between human experience and reliable knowledge extraction from it.

New paradigm thinking in the social sciences can no longer deny the central importance of the subjective dimension of reality nor seek to reduce it to its chemical and nervous physiological constituents. The call for new economic theory is based on the premise that the persistence of poverty together with rising levels of unemployment, inequality and ecological degradation reflect the limits of the present conceptual economic system, rather than the practical limits of sustainable human development. A new paradigm in economic thinking is needed to make conscious and explicit the underlying concepts that limit humanity's ability to promote rapid advances in welfare and wellbeing for all human beings (Jacobs et al., 2018; Fiorini, 2019c).

If we manage the FIR with the same discriminative myopia, blindness and forms of denial with which we managed the previous industrial revolutions, the negative effects will be exponential (Zucconi, 2016). At social level, inequality and unemployment destroy opportunity freedom. Radical inequality significantly undermines opportunity freedoms and capacity freedoms and consequently radically undermines human capital as a foundation of community prosperity (Nagan, 2016). As the global age seems to bring new possibilities and challenges, we need now to think in much broader terms than ever before.

The field of innovation and creativity has more or less exploded in recent years with ever new data and applications, but there has not been a corresponding explosion of theoretical advances at

the inner core of human knowledge extraction by experimentation in science (De Giacomo & Fiorini, 2020). We follow current big data analytics approach, without thinking what we really need: Deep Unity Wisdom (Fiorini, 2019a).

The present considerations emphasize mainly better management of the ontologic, epistemologic, and axiologic unknowns. It is a relevant invitation to develop an effective Ontologic Uncertainty Management (OUM) framework for Learning and Creativity development, emerging out of a Post-Bertalanffy General Theory of Systems (Minati et al., 2016). In this way, system homeodynamic equilibria can emerge out of a self-organizing landscape of self-structuring attractor points (Fiorini, 2016). Thanks to its intrinsic self-scaling properties, this system approach can be applied at any system scale: from single quantum system application development to full system governance strategic assessment policies and beyond.

This article follows Charlie Smith's kind request to address Buckminster Fuller's question from which he created his extraordinary inventive technical and social inventions and projects: "At this extraordinary time of social, political and economic disintegration, with respect to Collaborative Innovation, What is the most important question we can ask, and why?"

According to the reflections presented in the previous sections of this article, the author's answer to this question comes from the central question of life and leadership with respect to Collaborative Innovation: "What choice can I make and action can I take, in this moment, to create the greatest net value to share with?" In Collaborative Innovation each individual shares his/her own worldview and answer to previous question. From this perspectives plurality, collective intelligence can emerge and overcome individual limitations into common wellbeing.

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