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# THEORETICAL APPROXIMATIONS IN LEARNING WITH DIGITAL TECHNOLOGIES AND THE FRACTALIZATION OF MEANING

Constantine Andoniou (a)*
*Corresponding author

(a) Abu Dhabi University, Dubai, UAE, constantine.andoniou@adu.ac.ae

## Abstract

The communication of information and consequent construction of knowledge in the era of advanced digitalization creates multi-dimensional and ambiguous social realities. To analyze how this takes place the paper introduces the '*infogramic analysis*' model which visualizes the mechanics and dynamics of the fractalization of meaning in the information flow. The paper discusses the epistemological background and the theoretical foundations of the model of '*infogramic analysis*.' It introduces the foundational topology in the form of theoretical approximations, namely: the '*infotype*,' the '*level-states of information*,' '*virtual implosion*,' and '*fractal dynamics*.' The analytical model put forward in the form of conceptual / digital / graphical approximations, is a radical methodological suggestion on how we can improve our understanding about the operation and impact of the system of information in the digital reconstruction of contemporary societies and on the re-realization of human consciousness in '*postmodernity-and-beyond'* era. The proposed theoretical approximations anticipate to offer an alternative way and to envision and endorse a political enquiry of the system of information by identifying patterns of exploitation, domination and struggle in a various real, hyperreal and other informational landscapes.



*Keywords:* Theory of knowledge, digital learning, digital technologies, infogramic analysis, digital implosion

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# 1. Introduction

We are living in an unprecedented time of digital transformation, where the digital reorganization of information in hyperspace is defining the structure and content of the information flow in every human and non-human entity, the existence of which this system claims to represent. An analogy is suggested here among similar spatial contexts of informational systems, that is, patterns and organizational configuration of 'the system of information' in hyperspatial environments, also apply to account for the organization of every informational entity. Social structures, systems, and processes, and human agents depend on, and are directly affected by, the digital communication of information. The organization of the system of information can be understood by analyzing in depth what I term the code of organization of the system of information. Such an endeavor requires a fresh mindset of philosophical enquiry at abstract and ambiguous levels of thinking, without excluding logical and controversial paradoxes in reasoning (Andoniou, 2008).

Drawing on the theoretical realization and proposal of the multi-dimensionality and ambiguity of the construction of knowledge in digital learning, the paper introduces the theoretical foundations of the model of 'infogramic analysis,' and the epistemological background on which they are drawn from. It focuses in explaining the mechanics and dynamics of the fractalization of meaning in the information flow, and consequent construction of knowledge, through four theoretical approximations, namely: the 'infotype,' the 'level-states of information,' 'virtual implosion,' and 'fractal dynamics.' These approximations, set forth in the form of abstract / conceptual / digital approximations, are radical methodological suggestions for the development and enhancement of our understanding of the function and effect of information systems in the hyperspatial transformation of present-day world and on the re-definition of human consciousness in the 'postmodernity-and-beyond' epoch.

The theoretical conceptualizations of the structure and content of information systems, suggested in the current paper, refer in general, and in particular, to every entity that the system of information organizes including itself. Hyperspace or cyberspace is the spatial context within which these conceptualizations are realized, the space where human and digital technologies converge (Batty, 1993; Benedict, 1991; Ford, 2016).

# 2. Research Methodology

## 2.1. Alternative Visualizations of Spatiality

The underlying epistemological and ontological foundations of the current theoretical approximations are based on a critical exploration and analysis of post-modern philosophy of alternative conceptualizations of spatiality, namely, 'trialectics and thirdings' (Lefebvre, 1991, 2003), 'heterotopologies' (Foucault, 1986), and 'thirdspace' (Soja, 1996).

### 2.1.1. Trialectics and the Production of Space

Lefebvre's spatial viewpoint is a key element of the current theoretical propositions. Social reality is conceived and understood within a spatial framework with distinct characteristics. 'Space', wrote Lefebvre (1991), 'is becoming the principal ske of goal-directed actions and struggles … the disinterested

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stage or setting, of action" (p. 410). Social reality is presuppositionally and ontologically spatial. Following Lefebvre's perspective, the current theoretical approximations adopt a transdisciplinary approach to detect elements of exploitation, domination and struggle, as well as organizational principles and social change parameters, of the system of information. Lefebvre defined the 'production of space' in a dialectically inter-linked triad: '*spatial practice'* (perceived space), '*representations of space'* (conceived space), and '*spaces of representation'* (lived space)'. Spatial, therefore social, knowledge, according to Lefebvre is possible only over a series of '*heuristic approximations'*, there are no 'conclusions' that are not also 'openings.' Moreover, there is always *the Other*, a parameter that disrupts, disorders, and reconstitutes conventional binary oppositions (Middleton, 2016; Piazzoni, 2018).

#### 2.1.2. Heterotopias: Illusionary 'Other' Spaces

Foucault (1986) looked at spatiality as the search for 'other spaces' observing that more 'real' are '*heterotopias,*' '… a kind of effectively enacted utopia(s) in which the real sites, all the other real sites, can be found in the culture, are simultaneously represented, contested, and inverted.' Any information system can be argued to consist a '*heterotopia*'. Applying the heterotopology principles to the system of information, I contend that *the system of information can be recognized, within the totality of global signifiers and representations, in adverse formations, it can transmute in the arrow of time synchronizing to the specific environmental conditions it inhabits, it can exist in various and incompatible spatial arrangements, it shows heterochronic structure, at the same time it can be locked and remote or exposed and penetrable, it can generate illusionary 'other' spaces.*

#### 2.1.3. Thirdspace: Real-and-Imagined Places

'Thirdspace' (Soja, 1996) is an alternative conceptualized approach about the relations of meaning and the essence of our native and constructed spatial imaginations. Soja described 'thirdspace' as a creative rearrangement and expansion towards a diversity of multiple real-and-imagined places. It consists an approximation of investigating the same subject from different perspectives, 'a sequence of never-ending variations on recurrent spatial themes.' This approach is applied in the current approximations as a form of flexible and dynamic open-end conceptualization and reconsiderations of the structure, organization, and communication of the systems of information. Soja theorized Thirdspace as a secret and imagined object, filled with illusions and allusions. This is a common space to all still never completely revealed and realized, an 'unimaginable universe'. Thirdspace also calls for trialectic thinking, as an essential condition of understanding the limitless composition of life-worlds that are radically exposed and flexibly radicalizable. Trialectical thinking challenges traditional modes of thought and accepted epistemological positions. It can be unsystematic, disorderly, constantly developing, unpredictable, not always revealed; this is a shift from existential ontology to an epistemology of space.

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## 3. Findings

### 3.1. The Digital Reorganization of Information to Fractalization

The digital reorganization of information in hyperspatial environments, can be analyzed to patterns of organizational characteristics. Furthermore, the system of information, occurs in constant dynamic transformations and basic, controllable and programmable mutations of abstract coded and non-coded electronic signals, resulting in irregular, inconsistent, and consistently chaotic informational simulations. In the postmodern digital world references to meaning are not easily distinguishable, therefore, I argue that we can only refer to 'relations of meaning' such as 'meaningless', 'non-meaning', 'meaningful', 'me%a&ni*n(g', and so on. Continuous reiterations of the system of information produce complex sets of information, that is, fractal information, by self-similarity and fractional dimensionality. The fractalization of the system of information consists a dynamic retransformation of its content and meaning and is further below termed as 'virtual implosion' a process of five distinct phase spaces. 'Virtual implosion' is powered up by what is termed below as 'fractal dynamics' (Figure 1), a set of five interconnected micro-processes that fractalize information constructs into unpredictably programmable entities of questionable validity. 'Virtual Implosion' and 'Fractal dynamics' can also be understood as imaginary systems, that is, systems which properties, processes and actors occur and function both inside and outside the system's conventional limits. As Hedberg et al. (1997) stated, imaginary systems require imaginary vision as they consist artificial representations.

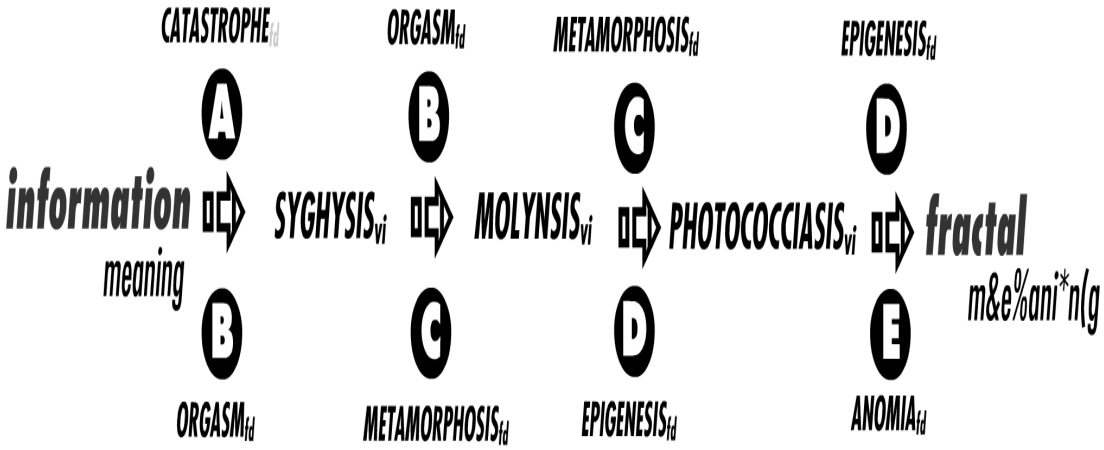


**Figure 1.** Phase spaces of Virtual Implosion and microprocesses of Fractal Dynamics

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### 3.1.1. The infotype

As the system of information disseminates by means of constant transformations across time, it preserves its quantitative and qualitative characteristics from one phase to another, into one distinct structural formation termed here '*infotype*'. The '*infotype*' refers to the distinct structural and architectural features of a particular information sub-system. Sub-systems may consist of the original infotype or they may combine characteristics of multiple infotypes. The '*infotype'* embodies the code (instructions) that the system needs to build its operational iterative proliferation and to orient its interactive alignment. Infotypes reproduce by *adaptation* and *habituation* to the host environments. Adaptation refers to quantitative and/or qualitative iterative processes resulting to mutation. Habituation refers to establishing and retaining the condition of adaptation.

### 3.1.2. Level-states of organization

Information systems are also characterized by a triad of inter-connected level-states of spatial organization: '*Era of Romanticism'* (actuality), '*Epoch of Ersatz'* (imitation), and '*Age of Chimera'* (fantasy). They consist space-time coordinates which expand along an infinite timeline. They represent the accumulated substance and concentration of informational content related to the historical and socio-cultural conditions (Figure 2). They coexist but at diverse space-time coordinates, with level-states dominating others depending on the strength and organization of information within a system.

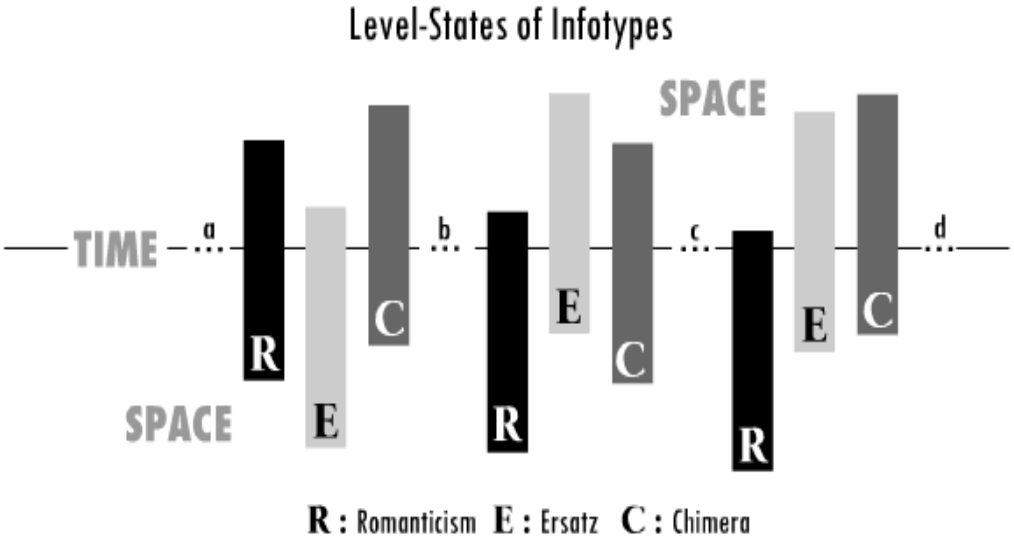


**Figure 2.** The infotype level-states of the system of information differentiate in intensity across the arrow of time and within distinct historical periods (a-b, b-c, c-d, and so on).

#### 3.1.2.1. The Era of Romanticism

The '*Era of Romanticism'* is the first of the three co-existing space-time coordinates of the spatial and historical organization of the system of information. '*Era of Romanticism'* is dominated by an exaggeration of *spatial practice*. The space we perceive as physical. is the main arena of the intercession

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of the information flow and production of social knowledge (actuality). The '*Era of Romanticism'* is characterized by a perceived reality (authenticity), consequently by simplicity and originality. The system of information is highly entropic, and the production and circulation of information at this level are unpredictable and chaotic. They are the result of the relative freedom that characterizes the establishment of interaction and association within this particular level-state. The volume of pure, unattached and original information distinctly predominates over the volumes of imitation and fantasy of '*Ersatz*' and '*Chimera*'. The '*Era of Romanticism'* could be the dominant level-state of socio-spatial structures of prime and elementary organization. In such an environment the networks of information hardly exist or just emerge, communication of information is rare and plain, social transformation and change is time-consuming. Potential growth and advancement follow social enquiry, error-and-trial, originating from the unconstrained *free* information flow. *Authentic* information ($\mathbf{a_i}$) is the result of an infinite and simplistic 'analogue' accumulation of data, which is reproduced and regenerated by continuous additional iterations according to the following formula:

$$\mathbf{a_i = a_i + ... + a_i^n + a_i + ... + a_i^n + a_i + ... + a_i^n}$$

$\mathbf{a_i}$ : authentic information, **i** : number of iterations, **n** : infinite

#### 3.1.2.2. The Epoch of Ersatz

During the '*Epoch of Ersatz' representations of space* are intensified, the meaning of information is challenged, transformed and controlled. The '*Epoch of Ersatz'* represents the space of conceptualization of information systems. In the '*Epoch of Ersatz*,' the spatial domain is characterized by the domination and manipulation of information. Information is broken down into controlled and distinct signs and codes, which in turn they construct social reality. The system of information is made redundant with randomness and entropy in control. Imitation and floating signifiers generate informational constructs within limited societal experiences. Social action and transformation are guided and ruled by reason and logic. The authenticity of '*Romanticism*' gradually decreases and fades away as the shift towards the fantasy of '*Chimera*' becomes increasingly visible and accessible. The '*Epoch of Ersatz'* characterizes developing and under-developed organizational structure, where networks of communication are well established. Systemic indicators would include experimentation, reasoning and possible manipulation of options and alternatives. Information in the '*Epoch of Ersatz'* becomes *simulated* information ($\mathbf{s_i}$) which results from the infinite and steady multiplication of authentic information, according to the following formula:

$$\mathbf{s_i = (a_i * a_i * ... * a_{ni})^n}$$

$\mathbf{s_i}$ : simulated information, $\mathbf{a_i}$ : authentic information,
**i** : number of iterations, **n** : infinite

#### 3.1.1.1. The Age of Chimera

The 'Age of Chimera' is characterized by fragments of fantasy as the prime elements of information systems. During the 'Age of Chimera' information becomes illusory, provoking and hyper-real. The spaces of representation become strengthened with the originality of 'Romanticism' and the simulated versions of

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'Ersatz'; the later are merged and integrated in the dominant lived experience. Information systems present an extremely intricate organization, during which 'reality' is encoded, 'hyper-reality' is decoded, across all socio-spatial directions. Everything authentic or original is rejected by enhanced tensions of fantasy and illusion, and by the rise of misrepresented spatial constructions. Entropic tendencies are reactivated resulting to a spatial environment interchanging between conditions of 'chaotic organization v.s. organized chaos'. The 'Age of Chimera' is characterized by the dominance of the code of the system of information through which constantly new spatial realities are generated and controlled. Unconventional patterns of organization are intensified to infinite possibilities of communication characterized by network flexibility and flexible networking. Conversion and transformation are rapid and in their extreme level they generate fractalized versions of the information flow. At this level, fractal information (fi) is the result of infinite set of multiplications among authentic and simulated information according to the following formula:

$$\mathbf{f_i = a_i * (s_i * i)^n}$$

$\mathbf{f_i}$ : fractal information, $\mathbf{a_i}$ : authentic information,

$\mathbf{s_i}$ : simulated information, **i** : number of iterations, **n** : infinite

### 3.2. Virtual Implosion

The *'Virtual Implosion'* of information consists a theoretical approximation of the structure and architecture of information systems, aiming to visualize how information, and the associated relations of certainty and security of meaning of information, they all transform (mutate) to fractalized constructs, where meaning is lost and it re-emerges within ambiguous and unclear 'relations of meaning'. *'Virtual Implosion'* develops across sequential, infinite loops of constanst transformation, in specific stages, within recurring, discontinuous and interconnected iterative sequences. During *'Virtual Implosion'* coded information, composed of abstract flows of electronic signals, undergoes quantitative and qualitative transformations following a series of mutational trajectories (*phase spaces*). The result is the fractalization of information, in the form of reproduced asymmetrical, inconsistent and chaotic alterations of the original. Fractal informational constructs present varying levels of simplicity, and distortion, and they emerge as versions of the original information open to manipulation, re-programming and control.

The *'Virtual Implosion'* of information is realized in three stages (phase-spaces) to fractalization: (a) '*syghysis'* (deconstruction): quite well-ordered informational fragments of meaningful information are deconstructed into the specific units; these are then reordered arbitrarily, in disorder, around a main point of reference; (b) *'molynsis'* (differentiation): in '*molynsis'* the arbitrarily spread distinct units, differentiate attaining varied dimensions and levels of importance, status, and organization; (c) *'photococciasis'* (reconstruction): with *'photococciasis'*, the differentiated tendencies on the component of information units, produce a non-linear distortion to unsystematic retransformation of fractal dimensions. A detailed description of each one of the phase spaces of *'Virtual Implosion'* follows in more detail. Also considered, brief descriptions of the systemic organization and conditions of information (meaningful information vs. m&e%ani*n{g-ful fractal ) before and after *'Virtual Implosion'*.

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### 3.2.1. Information

'Information' is a system of transferable knowledge concerning actual facts, usually communicated as data sets combined into messages entailing some relation to meaning. A system of information, in its initial condition, stands at a potential equilibrium, characterized by the uniform spatial distribution (homogeneity) of its constituent parts. It is an isotropic system showing the same properties in all spatial directions. A system of information consists a homeostatic inertial frame, meaning, when no external interference is involved, it remains either at rest or in homogenous motion within a certain absolute space within which it is defined. Interconnections of meaning among the fragments of information, act in principle as an electro-weak force that keeps the powerful interaction intact, and as a whole keeps a meaningful order in the system of information. The interconnections of meaning are based on existing libraries of cloned knowledge, on associations formed between with internal data and external interactions from the surrounding environment. The strength of the associations and interactions of the fragments of information in a system of information, is characterized by flexibility, which implies fragility, in other words, they stand in a potentially dynamic stage of change.

A system of information is also characterized by moments of polarization in relation to developing associations and interactions with other systems of information. The meaning of information is interactively vulnerable, due to the questionable intensity of interconnected associations, and this consequently accounts for the potential for 'disturbance' of the meaning due to interference. Whereas, the structural composition of the fragments of information accounts for the global kinetics of a system of information, the strength of internal and external interactivity is responsible for the susceptibility, fragility and potential of change. The interactive intensities of a system of information, can lead to systemic stability or instability, since they depend on the entropy of meaning generated from the multiple polarizations of the components. The meaning of an original system of information can increase towards greater disorder when associations and interactions are destabilized. Certain internal interactions of the fragments of information show greater resistance of links to surrounding external intruders, and in this way externally interfering systems of information, can be dissolved in fragments of information, and assimilated and absorbed very shortly after the interaction by the receiving system. At the same time, other interactions of the fragments of information are loosely linked and are prone to destabilize and form associations and get mixed with external fragments of data. Internal interactions of fragments of information depend on space-time symmetries. Strong interactions present isospin symmetries, whereas other weaker interactions present rotational symmetries or symmetries of reversal under inversion of the arrow of time. The interactions of the fragments of information, in moments of imbalance, create mobility, which assigns differentiated performance of each component. Some of this mobility concerns assignment of specialized function to fragments of information, assimilation of invading fragments of data, which can be of positive, viral, or negative nature. Mobility will also serve as a recognition or translation or neutralization tool of the interacting fragments. The preservation of the autonomy and integrity of a system of information is dependent upon the successful engineering of the conditions through which imbalances among internal and external, associations and interactions, can lead to the isolation, transfer, replication and reactivation of the system of information.

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### 3.2.2. Syghysis (gr. σύγχυσις)

The 'syghysis' (confusion; a confused or disordered condition; disorder in reference to ideas, notions) of the system of information occurs with the fractal deconstruction of the system into its constituent components. Fractal deconstruction initiates fractal alterations, generating random movement of the fragments and forcing their spatial rearrangement in the periphery of the original core meaning. The dynamic equilibrium of the original system of information is distressed by means of external interference of similar, contradictory or indifferent information. External informational disturbances intrude and generate a disorderly mobilization of the fragments by increasing the entropic systemic tendencies. Their mobilization reaches extreme degrees of intensification, bouncing between structural expansion and collapse. The tectonic vibrations of the pending external associations 'break through' the architecture of the interactions of meaning of the original information, and 'fire up' a random heterogenous mixture of fragments, which spread along spatial curves of reference to a central point, on a continuous rearrangement process. The established associations among fragments of information deteriorate with the emergence of their undifferentiated interlinking with incoming associations, which 'fill up' the spatial structural cracks of the 'damaged' associations of the original system of information. Subsequent multiple polarizations of interactions, among alien and host fragments of information and fragments of data, alters the shape and form of the system, and reproduces a temporary equilibrium of entropy. The system of information advances towards the synchronization of two conditions: a state of homogenous heterogeneity (similar patterns of differentiation) within the system and a state of heterogenous homogenization (differentiated patterns of similarity) outside the system. This way it preserves the limits of the internal entropy of meaning and balances the interaction with the potential external entropy of meaning. Existing associations are not totally destroyed, but they remain into prospective susceptibility to ever active unstable external interactions of organized complexity. Asymmetrical patterns of associations appear among the fragments of data and information, which are assigned self-referential functional meaning, this way becoming 'open' to the possibility of novelty. The autonomy and integrity of the meaning of the system of information is now deconstructed from a state of initial perpetuation to a state of depreciation and dispersion.

### 3.2.3. Molynsis (gr. μόλυνσις)

*'Molynsis'* (*infection; an action or process of contamination or corruption; a horrific condition of quality by negative influences)* is initiated with fractal disorderly mobilization which generates the architectural repositioning of, both homogenous and transgenic, fragments of information, around chaotic peripheries of meaning. This leads to a phase of fractal phase of dissimilar application of selected and differentiated emphasis and scale on the indiscriminately dispersed fragments of information. The previously extreme intensification of structural upset of the environmental equilibrium is coming to a gradual stability and differentiated levels of meaning start to 'colonize' random strategic positions. Strong heterogeneity in qualitative transformation emerges, and it is relocated in spatial curves around a geometric core of meaning. Qualitative alterations develop in the fragments of information, the result of a continuous enforcement of prestige and importance, which in turn produces inflationary and deflationary effects on the meaning of the intermixed fragments. Overflows and leakages in the negotiation of external interactions

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result to re-differentiation, iterative differentiation, or neutralization of the qualitative value of all the fragments of information. Undifferentiated links of all involved native associations decline, and self-similarity among the chains of associations of the original and the transgenic fragments of information, becomes the decisive factor of initiating novel patterns of symbiosis or contracts for the extinction of meaning. The emerged self-similarity of the interconnections, implies infinite possibilities of cloning, towards reproduction, reverse generation or regeneration of new relations of meaning. Homogenous heterogeneity and heterogenous homogenization are established both within the inner and the outer entropic environments, which become semi-conductively vulnerable to qualitative non-linear stretching of organized complexity. New symmetrical patterns of interactions emerge which shrink the self-referentiality of the fragments of information and produce a re-differentiated, unrefined, fractional phase of meaning.

#### 3.2.4. Photococciasis (gr. φωτοκοκκίασις)

Fractal disorderly mobilization generates the phase space of *'photococciasis'* (*pixelation: the process of breaking down into pixels, smaller elements*). *'Metamorphosis'* has already added differentiated emphasis on the components of the system of information and forces the system towards fractal reconstruction of re-differentiated fragments through flexible non-linear iterations. Initially the dispersed fragments are assigned levels of differentiation, towards a gradual self-adaptation and relative stability. Both original and transgenic fragments of information are positioned strategically around the network of new associations of the freshly established equilibrium. Change takes place as an intense assigning and intermixing of qualitative characteristics along an alternating, between inflation and deflation, repetitive pattern. Structural expansion and collapse are reversed, and geometry settles back in homogeneity and isotropy. A regeneration process sets off, by which novel interactions are built and the fragments of information are allocated assignments of different functions. Tensions of differentiation and re-differentiation in the qualitative value of the system create interactions and associations characterized by fertility and/or sterilization. Prevailing and compliant fragments of information are participating in a symbiotic experimentation of self-similarity which results to strengthened interconnections of infinite possibilities and new reconstructions of meaning. Such possibilities may lead to extreme cloning, exclusion, reversal, superfluous repetitions, or intense contradictions in the construction of new meaning. Initially undifferentiated external associations, repair structural fractures of meaning, by building up links of qualitative continuities over damaged fragments or interruptions in internal interactions. Potentially semi-conductive fragments of information will increase the degree of their vulnerability to produce self-similar copies or distortions in organized complex symmetries. The weakening of self-referentiality leads to a phase of total extinction, of rough and meaningless character. An irresolute condition of the system of information occurs, where the later, becomes self-dependent to arbitrariness and irregularity.

#### 3.2.5. Fractal

*'Photococciasis'* generates the mutation of the system of information that is, *'fractal'* information (*irregular, contradictory and chaotic distortions of an original produced by iterations*), with fractal disorder, the iterative non-linear re-arrangement of the fragments of information towards a non-systematic liquification of fractal dimensions. Selective differentiation on the qualitative stress and importance of the

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fragments of information produces new architectural structures upon the flexible exploitation of non-linear associations among them. Randomly colonized spatial positions of differentiated levels of meaning are self-adapting to the gradual stability, and become compliant to the self-organizing properties of emerging interactions. Interactions of heterogeneity are stabilized within a renewed equilibrium, where expansion and collapse implode to a self-organizing isotropy. The alternating conditions of inflation and deflation of meaning, regenerate the process of the construction of interactions and associations, and of the assignment of functions, at diverse networks of relation between the new and the original meaning. The variety of the levels of differentiation is a result of, both qualitative selectiveness, as well as the result of chains of effective dominance and compliance of meaning among the fragments of information. Self-similarity becomes familiar with negotiated contracts of meaning among the components, and advances towards their verification or retreats towards their rejection. Symbiosis in the fractal system becomes dependent to the acceptance and agreement of the potential associations in the fractal construction of new meaning, whereas rejection and denial of the associations results to its extinction. The qualitative vulnerability of the fragments of information arises from fracture points along the lines of internal associations. Non-linear stretching increases the patterns of interruption and turns them into patterns of organized complexity, reduced-size self-similar iterative copies, floating in a state of synchronous homogenous heterogeneity and heterogenous homogenization of meaning. The shrinking of the self-referentiality of the components of the system of information reaches the point of implosion, that is inward collapse and disappearance, inside of which the *'fractal'* system of information evolves, actively independent and randomly unpredictable.

The *'fractal'* system of information is an irregular, disorganized mutation. The fractalized system of information presents repetitive distortions of its elements, without any explicit or required reference to any meaning, truth or reality, rather they refer to themselves. The qualitative property of the fractal the system of information lies in the simplification, reduction, non-complex transformation of original interconnections and interactions of meaning; fractals, are for this reason, visually spectacular, intellectually impressive and exciting versions of the new 'relations of meaning' and 'reality'. The increase of quantitative entropy of a fractal selectively emphasizes certain attributes and suppresses and diminishes others. The fractal presents a dynamic equilibrium of disorderly spatial distribution (heterogeneity) of the fragments of information (fractal fragments), and controversial, antithetical and unpredictable properties in its spatial environment (anisotropy). A fractal system of information remains in heterogeneous motion of qualitative discrepancies, triggered around fracture points, which become black holes of meaning in the fractal environment. Whereas the original the system of information was characterized by order, the eventual multi-directional re-collapse of meaning in a fractal, is characterized by strong gravity and concentration of mass of meaning in condensed form. Irregularity and extremity of fractal external interactions violate existing banks of cloned knowledge and lead to ultimate and extravagant relations with the environment. Vulnerability and plasticity of shape and form and a balanced multiple polarization of associations and interactions characterize a fractal, which may regenerate new processes of virtual implosion with other systems of information or fractals. The structural architecture of a fractal, accounts for the exhibited vulnerability, fragility and anomia, whereas the irregularity of the patterns of interactivity accounts for the potential manipulation, controllability, and programmability. The later may regenerate distorted versions of an original, and disguise it as the original itself. Fractal interactivity can lead to

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unstable disturbances and interference with systems of information by means of increasing their entropy towards a chaotic environment of disorganization, and the reconstruction of the system along space-time symmetries of rotation, inversion, reversal and other unspecialized virtual discrepancies. The viral character of the fractal the system of information leads to an initial neutralization and subsequent liquification of the original version, and produces dubious interpretations of the original system of information.

### 3.3. Fractal Dynamics

The '*virtual implosion'* of the system of information towards fractalization, is driven by five inter-connected controlling micro-processes, which make possible the transformation among the three virtual implosion phases. They are hereby termed as *'fractal dynamics'*: (a) *'catastrophe'* (*destruction*) causes the '*syghysis'* of the system of information, by deconstructing the elements of the system to fragments; (b) '*orgasm'* (*excitement*) concludes '*syghysis'* and generates '*molynsis,*' by producing arbitrary motion of the fragments to positional rearrangements in the periphery of the system; (c) '*metamorphosis'* (*transformation*) ends '*molynsis*' and starts '*photococciasis,*' generating differentiation among the fragments, and conveying various degrees of importance and substance; (d) *'epigenesis'* (*rebirth*) ends '*photococciasis,*' restructures the transformed fragments with flexible non-linear distortions towards fractalization; and (e) '*anomia*' (*lawlessness*) ensures the fractalization by irregularly disorganizing and reconstructing the fragments.

#### 3.3.1. Catastrophe (gr. καταστροφή)

*'Catastrophe'* (*a final event; overthrow, ruin, calamitous fate; a sudden disaster, wide-spread, very fatal, or signal*) generates the *'syghysis'* in the system of information, breaking apart and deconstructing the informational components into its constituent parts. The dynamic equilibrium of the system of information is disturbed by means of interference of externally interacting, similar or opposing systems of information. Due to this interference, inner mobility in the system is generated, which directly affects the homogeneity of the fragments of information, and causes them to alternate repositioning between expansion and collapse. The structural vibrations of interfering fragments of information set off the mobilization and deconstruction towards a heterogenous distribution. The established interconnections of meaning of the existing fragments of information lose strength, due to their interaction with the emerging interconnections of the incoming fragments. The incoming interconnections weaken the associations within the system of information and 'fire up' its structural transformation. Change initiates within the increase of activity of multiple polarization, which alters the spatial dimensions of the system. The system of information moves towards a state of homogenous heterogeneity (internal entropic meaning) and heterogenous homogenization (external entropic meaning). Existing interlinks between fragments of information are interrupted, but not destroyed, and become potentially vulnerable to internal mobility and interaction with interfering fragments of data. The system of information becomes an unstable system of organized complexity, wherein space-time symmetries create asymmetrical patterns. In intensified moments of interaction like this, fragments of information are assigned the special function of acting self-referentially, preserving the relative autonomy of information, still depreciating and confusing the integrity of the meaning of entailed in the system of information.

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### 3.3.2. Orgasm (gr. οργασμός)

'Orgasm' (immoderate or violent excitement; excitement or violent action accompanied with putrescence) completes the 'syghysis' of the system of information and powers up 'molynsis.' 'Orgasm' produces random movement of the fragments of information and forces them to rearrange spatially along the periphery of original meaning and within the defined systemic boundaries. The equilibrium that characterized the original state of the system of information is distressed and a disorderly intrusion of incoming fragments of information commences. The mobilization of the intruding components is intensified and they start to interfere and intermix in original spatial reference points. They spread randomly on a continuous process of rearrangement. Intermixed fragments of information are placed at new positions with regard to a core reference point of meaning, and remain susceptible to infinite possible alternative directions around this point. Repositioned expansion reaches the outer limits of extreme meaning in the system of information, whereas repositioned collapse retreats to the inner limits of minimal meaning in the system. This heterogenous distribution breaks down the chains of internally established associations and deconstructs the established meaning of the whole system. The externally emerged interconnections 'fill' the spatial gaps of associations. The interrelation that develops between the new interconnections is undifferentiated, that is, one of embryonic character, therefore the developed elementary new associations are weak, but clearly characteristic of the structural transformation taking place. Multiple polarization re-establishes relative stability of the disorderly environment, sustaining the dyad of homogenous heterogeneity (internal entropic meaning at stable level) and heterogenous homogenization (balancing the effect of external entropic meaning). Previous interconnections, having surpassed their limit of vulnerability, are destroyed as a result of inner and outer interactions with the new arrivals. Fragments of information are distributed into spatial asymmetrical patterns of strong self-referentiality, open to the development of new associations. While the autonomy and integrity of the dispersed components is high, the meaning of the system of information is confused, if not totally lost, due to the total destruction of the associations within.

### 3.3.3. Metamorphosis (gr. μεταμόρφωσις)

'Metamorphosis' (the action or process of changing in form, shape or substance; α complete change in the appearance, circumstances, condition, character, affairs) completes the introduction of 'molynsis' in the system of information and generates the 'photococciasis' of the system of information. This is done by producing levels of differentiation which, in turn, assign various degrees of emphasis and substance to the randomly dispersed fragments of information. The random disorderly mobility of the fragments of information comes to a relative stability of dispersion, and both original and transgenic fragments occupy new strategic positions. The mobilization of fragments of information is more of an intensified assignment of parameters of quality rather than geometry, regenerating transgenic fragments of information. Placed in random core and peripheral areas they inflate and deflate, in terms of qualitative value, to the new interconnected meaning of all involved systems. Some fragments of information will retain their previous qualitative value, or will be re-differentiated, while some others will show critically low levels to the point of inability to interact and build up associations. Self-similarity between original and transgenic fragments

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of information is important for their symbiotic survival or extinction. Intermixed fragments of information are loaded with fresh potential to interconnect and form associations of an infinite number of possibilities. Depending on the nature of interactions and associations, these possibilities extend between the extremes of exact cloning of the original meaning to the full reversal of it. Chains of associations are visible, potentially restored, still, undifferentiated. Spatial gaps are filled in by the structural variations along a qualitative scaling of all components. Structural gaps exist only at the point of pending associations and interactions. Multiple polarization retains stability and entropy remains stable. The instability of differential structural stress increases the vulnerability of the new fragments of information. New symmetries are re-established and self-referentiality is weakened. A re-differentiated partial autonomy of meaning develops, still, of crude and as a whole meaningless character.

#### 3.3.4. Epigenesis (gr. επιγένεσις)

'Epigenesis' (the development of a complex entity, from a simple, undifferentiated unit) is, in a way, the reverse process of 'orgasm.' It signals the end of 'photococciasis' and triggers the fractalization of the system of information. Epigenesis reconstructs the differentiated fragments of information by applying stretching to the flexible non-linear associations among them. The self-adaptation of all the fragments of information to the relative stability within the spatial boundaries of the original meaning of information is followed. A renewed equilibrium of interaction among the fragments of information is established and a structural change takes place. Homogeneity and isotropy are restored by means of a reverse version of the initial condition between expansion and collapse during 'catastrophe.' Structural mobility is regenerated setting off the reconstruction of interactions and associations and the assignment of functions of each fragment. Depending on the effects of 'metamorphosis,' stronger interactions are formed among dominant fragments of information, and weaker among compliant fragments of information. In antithesis with 'catastrophe,' these interconnections strengthen the associations within the system of information and indicate the possibility of forming new arrangements of meaning. The self-similarity exhibited, by previously transgenic fragments of information, to original ones, allows the development of a familiarity for associations with them, but it does not guarantee absolute inclusion of all fragments, or it does not exclude the possibility of including superfluous repetitions or contradictions in the construction of new meaning. Moreover, the structural non-linear stretching of the fragments of information may result in fracture points, which damage the fragments or interrupt the interaction, producing smaller self-similar copies or distortions in the intended result. Increases in the entropy of meaning are temporal and along an interruptive pattern, having the effect of an irresolute condition of the information between homogenous heterogeneity and heterogenous homogenization of meaning. Organized complex symmetries emerge and they disperse in complex patterns of associations and interactions. Any kind of local or self-reference as a whole in the system of information, is lost; the new information becomes self-dependent and reliable to randomness and unpredictability.

#### 3.3.5. Anomia (gr. ανομία)

*'Anomia'* (*disregard of law, lawlessness; the state or condition lacking of accepted standards or values*) characterizes the transition from *'photococciasis'* to the *'fractal'* phase of the system of

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information. It is the process which secures that epigenetic components of the system of information will undergo an irregular disorganized reconstruction into fractals. '*Anomia'* consists an anarchous phase of final mutation into distortion, repetition, non-referentiality to meaning, truth or reality. The quantity of iterative transformations as the result of epigenetic non-linear stretching overpowers the qualitative and potentially meaning-inclusive fragments of information. Quantitative entropy increases, diminish or alter quality properties, or set controversial or antithetical (to the original information) qualitative properties: they assign primitive simplified versions, which do not require complex, meaning-related, interconnections and interactions. Equilibrium, homogeneity and isotropy show self-similarity to the original information although they are potentially unpredictable in this new phase. Extreme states of mobility appear, either dynamic expansion towards further iteration or eventual re-collapse inwards (implosion). Interactions, associations, and functions become irregular, ultimate, and extremely spectacular. Self-similarity decides the selection of fragments of information for building up new interconnections, which unavoidably will include qualitative contradictions of already differentiated fragments of information. In the same way interactions of meaning and associations with other systems of information will present qualitative discrepancies. Fracture points in interactions may become starting or ending points in building up associations, whereas structural distortions in fragments of information themselves, may eventually become dominant and powerful attractors in the new system of information. Because complex interconnections are not a requirement to the construction of meaning in the anomic system of information, the later, is in itself vulnerable to manipulation, not necessarily intentional directions being present. This vulnerability also arises from the simplified form of reduced complexity in associations and interactions that the system of information is shaped into. As such it becomes controllable and can be programmed to altered versions of the original. If it is extremely difficult to regenerate an exact copy of the associations, interactions and construction of meaning in an original system of information, it is though, relatively simple to produce altered and distorted copies and even easier to disguise them as exact copies of their original. And that … is a '*fractal reality'*.

## 4. Conclusion

The structural, operational and organizational characteristics of contemporary world society consist reflections and expressions of a continuous and intensified digital re-organization of the information flow that constitutes them. In a time where digital technologies and the media dominate the world cultural experience, this re-organization leads societies towards social formations of variable and infinite possibilities. The systemic organization of information is reflexively manifested in forms of social knowledge which in turn discursively reproduce and regenerate the social architecture and organization. Within our contemporary 'postmodern-and-beyond' world the system of information is defined through a crisis of representations, the reassignment of the meaning of reality and the reorganization of the reality of meaning. The vulnerability of information in postmodern digital environments is partly responsible for the reconstruction of the digital validation of reality or the digital reconstruction of hyper-reality.

The proposed theoretical approximations consist a meta-philosophical thorough methodological proposition aiming to radically deconstruct and reconstruct traditional and established discourses of thought and analysis on the production of social knowledge. The organization of the global system of information

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has a fundamental impact on the digital transformation of world societies and on the re-realization of human consciousness in the 'postmodernity-and-beyond' age. The theoretical approximations, proposed in the current paper, anticipate to establish an alternative way and to envision and endorse a political enquiry of the system of information by identifying patterns of manipulation, control and re-programming of various real, hyperreal and other informational landscapes and their content and meanings. Such an exploration will probably reveal and hopefully redefine the underlying organizational principles of the system of information and their impact on social transformation and social change.

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