Multilevel Webs : Proactive Influence on Markets.

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Abstract

Semantic Field Theory (SFT) poses that the mind works through semantic network-dynamics (i.e., knowledge-acquisition) and specific semantic parameters. Consequently, the mind is intrinsically non-dependent on space-time and yet its dynamics crisscrosses it. Personal and collective anticipations and projections create a Multilevel Web (semantic forces coupled with their environment) which has the specificity of being conjointly tied to the present and future time of implementation. The resulting system—or Sygma-Web—instantiates proactive and retroactive properties, such as informing both the project's present context and its future context, and the trajectory in between. Using as example the development of a new product, I argue that classical causality accounts for only a local effect of the future product (once released) on the future market. By contrast, the Sygma-Web formalization posits that collective expectations about a future shift in the market and consumer behaviors, are specifically the force that changes the market in the direction of the expectations.

Keywords
Self-organization, multilevel webs, proactive and retroactive influences, markets

Introduction

According to Henri Bergson (1888-1967), the fundamental self—being—can be apprehended only through states of consciousness engaged in a continuous flow and transformative process. These states, he underlines, are in a constant interpenetration both in between them and with the self, all these ongoing processes co-evolving in real time—the *durée*, the experiential time of the self. Bergson develops that the psyche reveals itself not only through this dynamic transformative process (the internal interactions) but also through the qualities associated with states of consciousness. The domain of the self, he goes on explaining, is one of quality, as opposed to the domain of matter being of quantity.
Bergson further remarks that our minds tend all too easily to extract gross and inert facets out of the dynamical and alive psychological processes we are experiencing, and to turn them into quasi-objects, henceforth remaining blind to their "*progrès*" (their progression in the sense of an evolving process). We endow these facets, explains Bergson, with a false separate and inert structure, whereas they are in constant interaction with the whole self and other psychological processes. Consequently, we obliterate their continuous transformation within "*durée*"—the process of unfoldment and evolution in real time. Bergson feared that any attempt at formalizing consciousness would lead to a distorting reduction amounting to 'objectifying' consciousness. He thus strongly doubted we could ever retain the qualitative aspect of consciousness (viewed as evolving states) in a formalization.
However, this is precisely my objective. My aim is to formalize a dynamical system in which semantic qualitative processes[1] (such as the creation of meaning, evolving intentions, feelings, and relationships, the ongoing valuation of goals and the value-driven conceptualization of a project) not only change drastically the thinking-feeling-relating personality, but influence the probalities of upcoming events and even the space-time actualization of the future project.

In a previous paper (Hardy, 2001), I formalized multilevel systems of complex interactions which I call Multilevel Webs (ML-webs). ML-webs are complex organismic systems that imply diverse organizational levels working in an

interactive and cooperative manner. These ML-webs exhibit numerous simultaneous inter-influences between forces and subsystems and they evolve dynamically through a deep connectivity grounding the co-evolution of processes. I analyzed two examples of ML-webs in this paper, cognitive systems (the human mind), and groups of people. Mind (or *semantic field*) can be formalized using a minimum of three levels: mind-body-psyche. However, the Semantic Fields Theory (SFT) I propose posits an indefinite number of organizational levels within the Mind-Body-Psyche system (or MBP-system). A group of people, as a system of MBP-systems, has in addition the interrelational level. In a similar way, organizations can be considered ML-webs since they not only add the interrelational dimension of the working team, but also specific structures both in objective space-time (buildings, machines, etc.) and in social space (social network, legal structure, etc.).

SFT proposes a specific organization of ML-webs based on a network-dynamical connectivity between elements/processes, taking place within and across levels. This connectivity is the basis for the cooperation and co-evolution of connected processes—the connections being triggered by the multimodal quality of experience itself. The enaction dynamics (i.e., perception-action coupling) proposed by Varela, for example, may be considered a specific type of connections (Varela *et al*, 1991). Thus SFT bypasses the usual formalization of mind as a hierarchy of levels (whether seen as networks or rule-systems) ruled by either a top-down or bottom-up causal principle.

In ML-webs, I argued (Hardy, 2001) the inter-influences between connected elements/processes within and across levels are so complex that they are fundamentally non causal and non deterministic. They reach beyond strictly defined causality because knowing the state of the system at t+1 cannot lead either 1) to figure any set of causes precisely and fully responsible for this specific state, nor 2) to deduce the state the system was in at t-1. They reach beyond determinism because there is no necessary determination in the evolution of the system. Let us remember that both Heidegger (1992) and Liebniz (1714-1992), while analyzing the principle of reason, highlight that causality is a specific type of link between events or systems, which is far from exhausting all the possibilities of links and interactions between them. In ML-webs, the dynamical connectivity between processes allows for any type of link—such as the network-link between an inner feeling and its verbal expression, the automatic translation of a thought into neuro-motor actions, or the deep interlinkage between cooperant learning processes. For example, in the learning of an artistic skill, the connective dynamic ensures the flexible binding of a percept (seeing a tool) with a concept (name of tool), a gesture (handling the tool), and a feeling (artistic sense) (Hardy, 1999). The linkage process furthermore carries subtle qualifiers of thought and action (such as opposition, analogy, category-grouping, delayed action), as well as its original semantic source (memory content, etc.). SFT formalization nonetheless allows for the existence of pockets of cause-effect mechanisms or circular-causality sub-systems within the ensemble of cooperant multilevel clusters of processes (for example, how the ratios of chemical gradients both sides of a cell's membrane strictly determine the actual exchange happening through it, whereas the ratios themselves are the non-determined product of complex open-systems exchanges).

In this paper, I want to explore a very complex and paradoxical ML-web—paradoxical in the sense that it embeds the interrelation between semantic processes (the dynamics of a cognitive system) and the space-time manifold. More precisely, I'm interested here in the way specific conative processes[2] (such as intention, goal, and expectations) impact on future events (happening in space-time) and on the future state of the environment. In short, my aim is to analyze how the way we conceptualize future events or systems is proactively influencing the space-time organization and configuration of these future systems.

Let me make a distinction, for the sake of clarity, between conative processes consisting of pure conceptualizations (intention, goal, expectations) and those leading to immediate action (such as the will to act). As I want to show how the way we *think* is in itself an influential force in the making of future events and contexts, I will not consider here practical actions, nor the will to act, for that matter, but only long-term intentions and goals. Thus I will take as my main example the conceiving of a business project aimed at being fully implemented within a definite timeframe. Let me first introduce some theoretical considerations about determinism and chaos, as well as space-time.

1. Theoretical Considerations

Self-organization and determinism
Chaos theory gives us a framework for understanding the formation of dynamical patterns and their global modifications through bifurcations of the system. First introduced by Edward Lorenz (1993), the mathematical

formulation and expression of chaos theory makes use of differential equations to show the existence of attractors and chaotic systems. Hence the concept of "deterministic chaos" derived from the fact that the created patterns, albeit dynamical and evolving, are nonetheless fully determined by the reiteration of the equation, while one of its terms is modified in a systematic fashion (e.g., accrued of one unit with each iteration). Given identical initial conditions, the reiteration of the equation (when a given variable is thus modified in a systematic way) will always bring forth the same attractor pattern—even if the dynamical properties of the chaotic curve or attractor thus derived leads to series of bifurcations and the emergence of novel global orders (see for example the Ruelle-Takens sequence of bifurcations of increasing complexity, Ruelle, 1993).

However, in natural (open) systems, the simultaneous interaction of an indefinite number of forces bring forth a constant modification of the system's organization. The complexity and diversity of interacting forces in a system trigger creative self-organizing dynamics, which in turn lead to the system's complexification. As Stuart Kauffman (1995) puts it: "The diversity feeds on itself, driving itself forward" (p.114). Thus, in contrast with mathematical chaos, given identical sets of initial conditions and control variables, a complex natural system will never show an exactly identical evolution in time. This does not preclude an observer from extracting a global typical pattern (such as recognizing a cyclone in a weather pattern), or to grossly predict its probable evolution (such as the cyclone's path). However, as all climatologists know, these predictions are just probabilities that need to be updated at each step by taking real time measurements of the variables. This is the reason why it has been pointed out that chaos frameworks reveal the regular patterns forming at the macro-level, while stochastic events happen at the micro-level. Benard cells, for example, may always form in heated water under the same conditions, however, their actual configuration will always be slightly different, and even so from one instant to the next in the same liquid.

When we are bent on extracting patterns in semantic or psychological processes, we are even more at a loss to find workable and useful formalizations showing sufficient adequation with what is happening in real human life. The conditioned-learning pattern, for example, while easily formalized and lending itself to quantitative measurements, far from addressing the complexity of real-life learning, acknowledges solely one of its possible facets, that is, a constrained, supervised, and closed, learning process. To the contrary, an open and creative learning process is more truthfully formalized through a connective framework (Hardy, 1999). Another example: logic has been classically taken for the epitome pattern of intellectual (non-perceptive) thought processes. However, recent research shows that most of our thinking does not rely on logic and reasoning, but rather on analogies, metaphorical thinking, symbols, etc., (von Bertalanffy, 1967; de Bono, 1970; Reber, 1993). Similarly, we may question the usefulness of applying classical formalizations of behaviors, such as the fight-or-flight schema, to real human life. The way humans deal with their own fear is immensely more complex than just a binary alternative in external behavior—without even mentioning that we are generally plagued with not one, but rather a multiplicity of fears, each one in turn opening on an array of possible behaviors and coping strategies.

Time and space

Several thinkers stress the fact that the physical laws we have defined to understand matter have been extracted by an observer (Bergson, 1888-1967; Kuhn, 1971; Maturana, 1980; Bunnell, 1999;) out of a far more complex reality, bound to remain forever unreachable in itself (Morin's concept of unknowable "*Réel*," Morin, 1992, 1998). This may explain how science will ever remain on the move, the continuous presence of an unknown-horizon fostering in scientists a process of learning and self-transformation in order to extract new dynamics and laws out of the "*Réel*," and to unravel new facets of reality. Note that in Quantum Mechanics (QM), the existence of the observer (and therefore consciousness) is embedded within the theory, since it states the reality we are observing is already the product of an observer's interaction (while measuring it) with a quantum system[3]. Thus the only perceptible and measurable reality is already an "observed reality". Certain prominent QM theorists (Heisenberg, Von Neumann, Feinberg, etc.) thus tied mind dynamics—consciousness—to quantum events.

The qualitative leap brought about by QM in science shows us clearly that what we had taken for real properties of matter (i.e., as belonging to matter *per se*) such as Time and Space (1+3 dimensions), are better understood as "parameters" of matter. In their efforts to unify the diverse nuclear forces, physicists introduce dozens of new dimensions. Thus, dimensions are becoming more and more akin to descriptive parameters, rather than referents to objective reality or to a basic substance; that is, dimensions are concepts used to represent certain aspects of reality extracted by an observer. QM, as we know, jumps to 6 dimensions from the start (3 descriptors of movement and 3

descriptors of particles). If we turn now to General Relativity's framework, Time is conceived as "space-like," that is, spread in space, in the sense that events in the present are contiguous with future and past events.

Causality
Lets us now turn to causality. It has been classically understood as a causal mechanism in which the cause necessarily precedes the effect in a Past → Future time-arrow (Hardy, 2001). However, *retrocausality*—associated with a reversal of the time arrow (Future → Past), has been proposed by Henri Poincaré in the 19th century (Poincaré, 1952). He suggested retrocausality was a direct consequence of the temporal symmetry found in most equations of classical physics. In QM, Richard Feynman proposed that anti-particles can be considered as standard particles moving backwards in time (along a Future → Past axis); thus a "temporal zigzag" would be created. Other physicists, such as Costa de Beauregard (1963) and Sarfatti therefore advocate the possibility of information coming from the future and propagating backwards in time. Let us note that teleology—Aristotle's final cause—posits a retrocausal force whereby goals and the final state of a system are shaping its evolution in time.

With regard to space-time, SFT postulates semantic parameters non-dependent on physical space-time dimensions—such as semantic proximity and intensity. SFT states that any living organism, system, matter, or thing, is endowed with a semantic organizational level (the living's semantic fields or matter's eco-fields, Hardy, 2000a) the ensemble of which I call *semantic dimension* or *manifold*. The semantic organizational level in matter and the living exhibits properties so distinct from known laws of physics that only specific semantic parameters may describe them. Indeed, as stressed by some researchers (e.g., Nelson *et al*, 1996), there is a definite need for conceiving of specific descriptors of mental and subjective space (or of a semantic manifold) if we want to understand and formalize the particular dynamics and properties of mind and consciousness as distinct from the neuronal-physiological organizational level and matter at large. SFT thus posits that the semantic manifold is unbound by the constraints of either Newtonian or Einsteinian space and time dimensions, or by QM wave-particle manifold. 'Unbound' means that semantic dynamics are not strictly (causally) dependent on physical space-time-waves parameters, albeit it does not preclude the interaction and inter-influences of the semantic dimension with the physical ones, since this is the basis of a multilevel MBP system.

This theoretical positioning allows us to view the semantic dimension as unconstrained either by linear time or by spatial locality. SFT (albeit on its own theoretical grounds) reaches a perspective similar to that of General Relativity in posing that future and past times coexist with present time; however, in contrast with it, SFT posits that semantic network-dynamics, insofar as they are not dependent upon physical space-time constraints, may establish strange non local connections, on the one hand between present, past, and future mind-states, and on the other hand between these mind-states and external cognitive or environmental semantic fields. The complex semantic system I will analyze in this paper—a multilevel web stretched across time— is a singularity of that sort.

2. Learning Process and Formation of Events

The learning process
Semantic Fields Theory (Hardy, 1998) proposes that any cognitive act or psychological task entails the creation of a constellation of linked processes evolving in a cooperative fashion. In a first encounter with a situation, for example a traditional feast in a foreign culture, the percepts and sensations we have about a multiplicity of contextual elements and relational dynamics are understood by a multimodal connective process. Percepts about the event become meaningful when they connect spontaneously 1) with similar elements and dynamics from our past experience and our own native culture, 2) with already known patterns of the foreign culture, 3) with what is said among people or told to us, or else 4) by guessing or sheer intuition about their meaning. Simultaneously, percepts are connected with real time internal sensations, feelings, and qualitative aspects of the ongoing interpersonal exchange, etc. Thus, each time we witness a novel event or go through a novel task, a whole constellation of processes, a *Semantic Constellation* or *SeCo*, is created, that links together ideas, words, concepts, percepts, gestures, sensations, feelings, and of course complex neuro-physiological processes. Then, when we happen to be involved in a similar situation, or when we want to perform the same task, this specific SeCo is reactivated. This enables us to draw from the heuristic knowledge the SeCo already contains and moreover to add to it novel elements or to refine the cooperation of its internal processes (i.e., to gain better control over linked processes such as feeling-behavior-cultural context, thought-gesture coordination, etc.). For

each conceptualization or task, we thus have a dedicated SeCo, the dynamical organization of which expresses the exact state of our knowledge or skill (Hardy, 2000b).

Events-in-making SeCos
Moving further along this line of thought, I have developed (Hardy, 1998) that a social event is produced by a whole system of forces interacting with a given context. These forces being both physical-environmental and psychological-relational, viewing an event as an evolving network-dynamical system—an *event-in-making-SeCo*—allows us to formalize its evolution and its probable outcome(s). Chaos theory enables us to formalize how mechanistic forces (environmental hazards) can interact with psychological ones (beliefs), as well as psychophysiological states (anxiety) (Guastello, 1995). All the forces at play feed the event-in-making-SeCo with probability lines whose convergence will accrue the probability of a given outcome (the attractor(s) of the event-SeCo state-space). The set of semantic forces projected by individuals concerned with a future collective event concurs to the co-creation of the event. These forces are introjected in the event-in-making-SeCo, thus modifying its organization, and then retrojected back (somewhat modified) to their psyche. In other words, there is an ongoing two-way inter-influence between individuals' semantic fields and the SeCos of events they consider significant.

My aim here is to catch the subtle process of a mind conceiving of a new project (viewed as an event-in-making-SeCo), that is, to analyze the processes a mind undergoes while changing its internal organization in order to focus on the new project. I am not concerned with the practical byproducts of the thinking process—the actions and implementations in social context—but solely with the thinking process itself and its nonlocal influence on future events/contexts.
In our everyday life, we often imagine or intend a future event while specifying—explicitly or implicitly—its date or period of actualization. Such precise semantic projections concerning our own future may, for example, occur:
- while taking a firm decision or setting goals entailing a specific time-frame, such as "In ten years, I will...", or "I give myself two years to...".
- when we tie an action or goal to the realization of a specific event, as in "As soon as I finish this work, then..."
- when we have an insight about an existing activity, relationship, or way of being, and intuitively sense how it may develop in the future; or, if we sense the overall outlines of a future project or direction of development, and follow it with conviction and confidence.

Such projections essentially create an *event-in-making-SeCo* which shows the particular feature of being anchored at a specific point in the projected future. By using reference points in conventional linear time ("in ten years," etc.), thought establishes a powerful link between the semantic projections we are making and a certain moment of the future. The initial idea, generated in relation to the future event, plants a semantic seed at that future point in time. Having its own semantic organization and complex dynamical properties, this seed acts as the SeCo's attractor: while developing the idea and focusing on it, the person's semantic energy is actually being anchored in the future. To the extent to which it is 'nourished' (with recurrence and intensity) by projections consistent with its organization (the coherency parameter), the seed will naturally grow and flourish, constituting the event-in-making-SeCo. Thus we can consider the event-in-making-SeCo of a future event as a semantic constellation of a special sort, one which is tied to a future point in time.

Interface Regions
Here, then, we are dealing with one of the regions which acts as a two-way interface between semantic and physical dimensions. On the one hand, the semantic-dimension map clearly adjusts itself to the physical-dimension map, since the person uses the latter as a reference in order to think about the future event. Conversely, while adapting to the constraints of the physical dimension (environmental and physical forces), the semantic dimension also introduces its own dynamics: the probability of the event actually materializing as planned will also depend upon semantic parameters such as *semantic proximity* (e.g., the strength of links to the future event), *semantic intensity* (e.g., the psychological investment put into the projected event), as well as *recurrence* and *coherency* of the focused thoughts and projections.
As I pointed out, SFT's postulate—that semantic parameters are non-dependent on Newtonian space-time—allows us to view the semantic dimension as unconstrained by linear time. It is however constrained by our conceptualizations: thus, whenever we refer to a future event, the activated SeCo reaches out to the future time implied by the time referent. It follows that any event-in-making-SeCo is actually anchored to the specific point in the future pointed to by this event. This does not mean that the future event is predetermined, and fixed. To the contrary, the future event's existence is first

and foremost a semantic cluster: the SeCo created by the mind-psyche. Thus the event (more precisely the event-in-making-SeCo) remains in an unstable state, being constantly fed by the person's coherent or fluctuating thoughts, and in consequence by the slightly—or largely—fluctuating probability lines created by these thoughts.

Feeding the event-in-making-SeCo, fostering the event
The psyche injects meaning and organization into the future event's evolving SeCo according to the semantic introjection / retrojection dynamics. In a simple event-in-making-SeCo dynamic, the subject injects meanings into the SeCo, modifying its organization, while the modified organization is retrojected back to the subject; this loop continues as long as the person continues to generate new meanings about the event, and may start all over again the next time s/he thinks about it. In the present case, however, things are somewhat more complicated, as the event-in-making-SeCo is anchored in the future. Here, the SeCo (the attractor basin) retrojects its meaning back to the subject from some point in the subject's future; it is thus appropriate to refer to this dynamic as instantiating a *retroactive influence.*

Organizing the event's future environment, warping probability lines
One of the consequences of the anticipation dynamics is that each time we imagine a specific future event, we are in fact creating a very strong connection between our present life and a certain point in the future. A fully actualized SeCo is normally coupled to its environment and thus, being on a minimum of two (meta)organizational levels, it acts as a ML-web. Environmental forces, as coupled eco-fields, are among the forces interacting in a ML-web; they are to be viewed not as 'external or objective' but rather as internal intermingling and co-evolving forces *within* the system (Hardy, 2001). Consequently, when the mind projects new ideas and feelings, it works as an organizing force not only for the SeCo currently activated but also for the context and coupled environment of this SeCo. Given that here, due to time-stretching, the SeCo is anchored in the future, while organizing it, the mind also tends to organize the future environment which will form the context of the event. Hence the whole ML-web—event-in-making-SeCo and the context it organizes—acts as an attractor basin in the future, which, so to speak, warps events-trajectories towards itself. Walter Freeman (1995, p.142) points to a similar dynamic when he states: "The intentional self exercises choice at each moment of its unfolding life trajectory (...) By foresight and reason the self can pre-arrange a time and path at selected branch points."

Warping probability lines, creating intermediate events
While the semantic dimension's parameters are intrinsically non-dependent on space-time factors, of course they interact with these in the shaping of events. We naturally experience both the atemporality of our mind-psyche, and its anchorage in physical temporality. It follows that individuals' semantic fields are spread-out in time, and thus include their past, present and future semantic trends. Consequently, the event-in-making SeCo, and hence the time-stretched ML-web itself, are integral parts of the *present state* of the person's semantic field. So, while the time-stretched ML-web is creating its niche in the environment in the future, it is also reorganizing the semantic field of the subject in his or her present, to render it coherent with the ML-web. Hence *the main retroactive effect consists of creating or reinforcing retroactively a very coherent set of probability lines between the projected future event and the present.* In other words, if we picture the SeCo as the dynamical network we said it is, the weights on specific trajectories are added by virtue of our conceptualizations of the future event. Therefore our intentions and goals, in loose accordance with Aristotle's final causes, do influence and foster the making of specific events in our life. However, this is not happening in any strict (retro)causal way, but rather in an inter-influential, interactive way. Nor is it a kind of determination by the future, as in the poor definition of life that "everything is already written."

Irreversible processes, retrocausality, acausality
Here I would like to clarify the issue of irreversible processes, as first formulated by Prigogine and Stengers (1984). The idea that biophysical systems are, first and foremost, systems evolving in a time-frame, and thus implying "time's arrow", is of major importance. Like many others, I believe this concept of systems evolution is essential to our understanding of self-organizing systems, i.e., complex systems which are prone to modify their behavior and create new global states. It is also essential to our understanding of semantic systems, which show all the properties of self-organizing and nonlinear systems, in particular, as an evolution and complexification along the past → future axis. What I would like to emphasize is that the possibility of SOME connective, acausal, or even retroactive (rather than

retrocausal) influences does not contradict the concept of evolutionary processes. Let's begin with the most controversial influence: retrocausality.

There are two dynamics through which retroactive forces act on a semantic system. The first one is through a time-loop triggered by the conative agent at the precise moment (in the present) s/he thinks about the projected event. In this case, the retroactive influence will be mainly reinforced (or modified, or weakened) with each new projected thought. In that sense, a retroactive influence is simply one of the many forces (whatever their origin, or the dynamics involved) acting on the system and *influencing its present actual state*.

As for the second: According to the *coherency parameter*, once created, a SeCo tends to persist, unless antagonistic or incoherent semantic energies break it down. As the the event-in-making-SeCo is rooted in a future time, its semantic organization emanates a subtle but constant influence both on its future context, and on the current state of the person's semantic field and coupled environment. But again, if we model the state-space of the whole SeCo, these retroactive forces are just one group of forces among the many influencing the SeCo's organization and its probable evolution.

As for acausality, proposed by Carl Jung and Wolgang Pauli (Jung, 1960; Jung and Pauli,[4] 1955) to be the basis of synchronicities, I have developed (Hardy, 1998, chapter 11) that a synchronicity is a connective force whose input in the system (the SeCo) at time *t* may produce a slight shift or a radical bifurcation in its dynamical evolution. This bifurcation leads the system into a different evolutionary path. Here again, evolution is not counteracted or forbidden by instances of acausality, but only modulated, or shifted. Thus, retroactive and acausal forces are just two types of non-deterministic influences among all those which contribute to the evolution of the system in the usual time-flow.

Sygma-Web
To recapitulate, if there is recurrence and consistency (coherence) of projected thoughts, then the future event imagined by a person becomes an event-in-making-SeCo, that is, a semantic constellation proactively in-forming the event-to-be and expressing, through its flexible organization, the evolution of the thoughts and meanings directed unto it. This event-in-making-SeCo eventually stabilizes into a particular form, while growing in intensity. It now acts, from its anchorage at a certain point in the future, as a bidirectional semantic attractor, which, due to its paradoxical properties, I will call a *Sygma-Web*. Here are some of its features:

1.   It continually grows and changes, organized and charged by the subject's recurrent projections.

2.   Its organization subtly begins to proactively structure the context or environment around itself: in other words, the Sygma-Web creates a spatiotemporal niche for the future event to happen.

3.   It retrojects its (latest) organizational state towards the subject (and his/her semantic environment) in a future → present direction, thus instantiating a retroactive influence.

4.   It also retroactively influences diverse probability lines (or trajectories), bending them towards its attractor basin.

5.   As a consequence of the above, the event which unfolds in a present → future axis (as a result of probability lines) will tend to coalesce and finally be "trapped" in the sygma attractor's latest organizational state.

Our semantic field is a transtemporal agent, constantly seeding (or co-seeding with others) the events which concern us directly or with which we are in a strong, meaningful interaction**.** Therefore events happening to us are not just the product of good or bad luck; they reflect our own semantic positioning *vis-à-vis* these events and the world at large.

3. Influencing Future Markets

Let us take an example of a Sygma-Web: *A manufacturer announces it will put an upgraded product X' on the market; as an immediate consequence, the announced event has a dramatic inhibitory effect on sales of the current model X.* If we treat the problem as *only* the effect of consumers' perceived value of X' upon their purchasing behaviors, then we miss some essential dynamics at work.

Let us see how we can treat the problem using a Sygma-Web formalization.

Proactive semantic forces

All the specialists involved in the conception and the future implementation of the new product X' (such as the research and development team) collectively create and keep feeding an event-in-making-SeCo—let us call it *Sygma-X'*—that comprises all their concepts and expectations about the product and its future niche in the consumers' market. As soon as consumers know about the future product, they become additional agents in the co-creation of the Sygma-Web. As a semantic system, Sygma-X' stretches across time from the first conception of its idea until its envisioned time of distribution and sales. In Sygma-X', the future state of the market (the environment with which X' is coupled) is the future 'context' of the Sygma-Web. Following what we have seen above, this future environment is already being influenced by all people working to make X' a reality and by consumers' expectations, that is, by the whole collective time-stretched ML-web fueled by their semantic input. This means the manufacturer's continuous efforts to create X' as well as the way people understand the future product, are all proactive semantic forces already modifying the organizational parameters of the future market.

Retroactive semantic forces
In parallel, we must also take into account the retroactive effect of the Sygma-Web. Thus, the mere anticipation of the future market's characteristics by all people concerned, professionals and users, is bound to modify the present market. Indeed, anticipations have two major effects: the first effect is upon the consumers and professionals themselves who, in anticipating the future, modify their present behaviors. The second effect is on the future system: anticipations are *the* organizing force acting on the future context and modifying it so that it conforms to expectations. Let us underline that as soon as the announcement is made through the media, the consumers themselves become pro and retro-active forces *within* the Sygma-Web system. Hence there is importance in a company devoting continuous efforts in order to sense and comply with people's values and needs, as well as to work in sync with its human environment, as has been stressed by several researchers in the field of Organizational Learning (e.g., Senge, 1990; Lave and Wenger, 1990).
To conclude, classical causality at best accounts for a local effect of the future product X', *once it is released*, on the future market. By contrast, the Sygma-Web allows us to posit that *anticipations about a future shift in the market are specifically the force that changes the market in the direction of the expectations*. So while people project their expectations, a Sygma-Web is informed, or its organization modified, thus affecting both the present context and the future context—and of course the trajectory in between.

4. Paradoxical Properties of Time-Stretched Sygma-Webs

Let me focus now on the specific nonlocal properties of Sygma-Webs as dynamical networks.
To resume, the Sygma-Web:

- has two anchors in time: one in the present and a second one in the intended or imagined time of implementation.

- these 2 anchors act as 2 sub-SeCos (i.e., attractor basins) around which further processes and semantic clusters are going to constellate and get organized. While analyzing the Sygma-Web of a future project, we will thus distinguish between the present-time sub-SeCo (Sygma-t0), and the sub-SeCo anchored in the future (Sygma-t1). However, if we were to set a specific number (*n*) of stages for the project's implementation, the Sygma-Web would have *n* sub-SeCos, each one anchored to a precise envisioned time.

There are four sets of properties to this complex system, the Sygma-Web:
1.   properties of the 2 (or more) sub-SeCos themselves.
2.   properties derived from the mirroring sub-SeCos stretched in time.
3.   properties of the transformative process.
4.   paradoxical nonlocal semantic links.

- 1. Properties of the 2 (or more) sub-SeCos
The properties of event-in-making-SeCos are the habitual features of all SeCos: namely a multilevel network of semantic processes and clusters, behaving as a complex dynamical system. The whole network acts as an attractor basin and the core concept (the central semantic cluster) of the SeCo acts as an attractor. As said earlier, the dynamics are a spontaneous connective process that creates links between semantic elements/processes.

- 2. Mirroring properties

The sub-SeCo projected in the future (Sygma-t1) does not show the same internal organization as the sub-SeCo of the present project (Sygma-t0). In general terms, the present-state Sygma-t0 contains all our ideas about the project, the people connected to it, the actual thinking, reasoning, feeling, and our intended short-term actions. It contains as well all that we hope to achieve in the future, and the envisioned steps. In contrast, Sygma-t1, expressing the future implementation, regroups specifically the ideas, desires, decisions, and feelings pertaining to the future and ideal state of the project. In other words, Sygma-t0 contains the whole project, whereas each future sub-SeCo (Sygma-t+1...n) regroups solely the semantic processes linked to that future step. This derives from the fact that it is our continuous *present* (and thus ongoing) conceptualization of the project that creates and (re)organizes the event-in-making-SeCo in the first place. Thus the Sygma-Web contains correlated, albeit semantically distinct, time-stretched sub-SeCos.

To the extent to which we are modifying the core idea of the project—while we refine its conception, adjust to social and environmental constraints and measure feasabilities—the changes thus involved are immediately and simultaneously inscribed into the two (or more) sub-SeCos of the project. However, if we decide to make a temporary change in our project, and still want to get in the future what we had originally thought of, only the present Sygma-t0 will be modified. Furthermore, time-specific modifications of our project and actions will only change the sub-SeCo(s) linked to this time-frame—e.g., deciding to complete step 3 before even attempting step 2, due to current opportunities, may not modify the final future sub-SeCo (Sygma-tx).

- 3. Properties of the transformative process

The transformative process itself—the implementation of the project from state t0 to state tx (the final state)—shows interesting properties in terms of the reorganization of our mind (semantic field), and the influence the Sygma-Web has on our social and relational network.

a. Reorganization of our mind: The existence of the project as an event-in-making-SeCo in our semantic field (the SeCo comprising and organizing all the related concepts, ideas, and intended final realization) is from the start shaping our behaviors and actions. As soon as we have a working project and are intent on acting on it, we start thinking in accordance with the matrix of coherence of this project. Our thinking process is greatly altered as it seems that now (and providing our project is a big challenge for us and not just another whimsical idea) everything we are thinking about is bound to be viewed in the perspective of its envisioned realization. (For example, if we are going to take some holiday, we will immediately think: Can I use my free time for developing the project? Can I meet key people, work on the conception, visit related places?)

It is not just that the event-in-making-SeCo is strongly activated and highly energized but it also reorganizes our whole semantic field and deeply changes our mental landscape:

- A shift in priorities occurs, as the project uses up most of our time/energy and compresses the time left to do other things.

- All actions and alternative objectives are compared to the main goal and if they clash with the possible realization, they will be dropped altogether. The more they seem to overshadow the main project, the more they will be squeezed out of our scheduled time.

- With the new project comes along new areas of interest and focus, such as investigating in depth the domains of thought or action connected to it.

- The project will lead us very early on into modifying the networks, channels, and domains of information we are prone to scan, as well as the methods and technologies used to do that.

- It brings along an enormous creative spur, and thus accrues our *semantic energy*, to such an extent that novel ideas keep on surging and creative breakthroughs keep occurring.

- Finally, the more the project is based on innovation and brings novelty in our lives, the more it will change the way we understand and connect with people and friends surrounding us. Similarly, it will modify the way we conceive of what is happening in the chosen domain of realization. Thus the changes occurring may go as far as our building a novel integration of our self into society—in business, science, or whatever social group we are involved with.

-        The project may be the seed of a whole new worldview and social stand. For example it may trigger a move from a thinker's position to an "actant", a maker's stand.

b. Reorganization of our social network: The launching of a focused action, in whatever domain, implies a social (re)positioning leading to a sense of accountability and responsibility.

- Conception phase: Rapid changes in our social network: 1) The (re)positioning in our values and thinking landscape brings rapid changes in our social network. 2) We look for competent and helpful people in the new domain of interest, and start gathering associates and members of a team. 3) We are attracted to people that share our new focus and become quickly bored with old relations that cannot comprehend it. Thus the project brings a shift in how we value friends: the more they support our project, the more we will feel comfortable with them.

- Implementation phase: Global reorganization of our social network: Progressively, the changes will sweep through our life, and we will observe a turnover of our whole relational network that will affect not only the project domain and our professional relations but also friends. This is a very healthy development, not only because we now have a new way to measure our own 'atonement' with people, but also because all of these new encounters and ideas trigger a substantial increase in semantic and emotional energy. Indeed, in the measure we are able to shift to higher gear with our project (mentally, creatively, as well as in our actions), we may trigger in some of our supportive friends a spur of creativity similar to our own.

- 4. Paradoxical nonlocal semantic links

The fact that our intentions and goals create a delocalized semantic constellation anchored in the future has the greatest impact on events themselves. Indeed, the Sygma-Web acts as an organizational attractor not only in terms of influencing our own semantic field, but also in terms of influencing the way the project will be implemented, and even the way project-related events are going to happen.

The semantic connective processes in the mind are partially unconscious; I consider them part of what cognitive scientists call the "cognitive unconscious". They happen no matter what, whether we are aware of them or not. Our privileged and recurrent relations with peoples' semantic fields and particular eco-fields (such as scientific domains, objects, places, etc.) create highly energized links that instantiate a constant process of inter-influences. *Semantic proximity* allows for spontaneous connections between semantic fields to happen and be influential whatever the spatial distance between them. Thus sometimes, we may even connect in the semantic dimension with semantic fields akin to ours (because of some clusters being in sync, such as similar domain of interest, identical hobby, etc.) before we have met with the person or ever visited the place—which often leads to a feeling of "recognition" when we eventually get to encounter them. SFT is thus able to explain, at the underlying level, both the dynamics of thinking and our meaningful interrelations with others and with the world, while using the same network-dynamics and system-building (the connective dynamics).

Semantic connectivity leads to the onset of specific dynamics derived from the paradoxical properties of a Sygma-Web. The fact that our thought evokes a fully implemented project in x years (Sygma-tx), while thought-processes are themselves embedded in the actual state of our semantic field (Sygma-t0), creates a sort of *semantic-tunneling* effect between the partially similar sub-SeCos thus created. That is, it connects and coheres the semantically proximate sub-SeCos while it collapses time between them.

In order to understand the strange properties of a Sygma-Web, we have to visualize its *n* stages as forming a single system in which the transformative process is wholly contained from stage 0 to x. (The fact that the whole process is 'contained' in the Sygma-Web does not preclude the fact it remains unstable and oscillating, being in a continuous flow, as time and our conceptualization progress.) The Sygma-Web is thus extended and stretched across time between the here-and-now and the time of its intended completion. This Sygma-Web is highly charged with semantic energy as innovation and creation of meaning are two main factors contributing to the intensity of semantic energy.

Thus a Sygma-Web is:
- a multi-level web stretched across time,
- organized along the lines of our intentions and goals,

- interacting with its changing context,
- filled with a highly charged semantic energy,
- and anchored at n points in time (t0…tx).

Now picture this weird semantic system as a high-energy semantic field, in a constant process of flow and self-transformation, and thus appearing to oscillate. Imagine now this high-energy, intensely fluctuating, semantic system being immersed in a sea of low-intensity, slow-moving, semantic fields. As a result, obstacles and antagonistic semantic fields that are not at the same energetic level tend to be kept at bay and to finally drift off the scene, toward the edges of the energetic stream. In contrast, the Sygma-Web, hyperactivated, keeps on scanning its extended environment (actual context, future times as well as future environments), and triggering spontaneous linkages with numerous 'resonant' clusters in surrounding or proximate semantic fields. As a result, numerous encounters happen with people or organizations that could be involved or connected with the project (most appearing like normal encounters or coincidences). However, some encounters are so improbable that they are recognized as synchronicities or, on looking back, as events that were 'meant to happen'. In fact, it is as if the project were attracting to itself the people and means allowing for its realization. Thus, in the measure of the strength of its semantic energy, the Sygma-Web keeps on influencing and producing events that fit with its internal semantic organization, that is, events that comply with the goals and meaning it embeds.

5. Conclusion: Sygma-Webs and Social Improvement

Through the Sygma-Web formalization, we are led to conceive of complex connective dynamics and web-systems that, while quite unique in their properties, still seem to pervade our experience in social space. Complex social and mental dynamics need totally novel conceptualizations if they are to be understood, and systems sciences, complexity theories, as well as chaos theory, provide fecund grounds for theoretical exploration. However, only the translation of these formalizations into practical tools and strategies—for the management of projects, for organizational learning, or for personal and social improvement—may show the usefulness and therefore the validity of an embedding theoretical framework.

We usually think that an event is set into motion by hard causes (physical, economical, etc.) and will happen in its totality on a fatal day and its immediate aftermath. That is, we assume that an event E is of one block, happening only at the precise moment we observe its occurrence. However, in reality, this is not so. A social event is the expression of a complex Sygma-Web of forces, created by the deep interweaving of semantic and environmental forces. The Sygma-Web self-organizes progressively around two attractor-basins, one in the future-state and the other in the present-state of the semantic fields of all people concerned by the event. At each moment, the organizational state of the attractor-basin in the future shows the most probable configuration of the event-to-be. Thus, only a few clusters among these forces represent causal chains and constraints at the physical level, while many others are purely psychological, social, and geopolitical forces (values, goals, behaviors, feelings, collective interpretation of prior events, cultural history, political choices, collective worldview, etc.). Indeed, as individuals, we start interfering in the making of a social event from the moment we start thinking and having strong opinions about it. We keep interfering with the future event and co-creating it (providing it concerns us) each time we think ahead about it.

Furthermore, we generally consider events to be only material and impacting on our lives from the outside, without us having any real responsibility in their occurrence. But viewing mind as an organizing force leads us to acknowledge that the way we think about future events feeds these events in a particular way, and leads to specific outcomes; it shows us how much our minds are co-creating the events that will later impact on our lives – whether consciously or not. In other words, our Mind-Body-Psyche system, as a whole, is responsible (even if partially) for the kind of events we will live later.

To state things in a simple (albeit not realistic) way, if the event would concern our relationship with a friend, we may say that we would have grossly a 50% authorship in the making of the event. If it concerns a group of ten people we are part of, we would have a 10% authorship. So let us imagine that we suddenly have the intuition that a certain event E may happen and we start focusing on it: the way our psyche and body react to the thought of this possible event builds up a specific semantic state in us. This qualitative state of our semantic field will be a predominant factor, as far as our 10% input is concerned, when the event comes to pass. Now, if we ponder on major collective events, we may understand that the predominant cultural worldview (thoughts, behaviors, values, and the like) has a major influence in

the making of world events.

To conclude, events are not solely material phenomena: they also have a semantic dimension. They are woven out of complex networks of forces, only a few being mechanistic causes, while most of them are the very semantic fields that make up our minds and our culture. This is why there is a possibility to have an influence on events and to modify their outcome for the better, by simply shifting the personal/collective way we think about them and relate to them. Different mental techniques such as creativity, visualization, generative thinking, or meditation, will thus prove useful in transforming our perspective and, in the end, in changing the very way events are going to unfold. As individuals or as a society, complex non-deterministic frameworks such as the Sygma-Web may render us aware of our participation in the creation of world events; moreover, it provide us the very strategies that may enable us to influence the unfolding of events in a way that expresses a more responsible and politically correct worldview, respectful of other cultures.

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Notes

[1] In the Semantic Fields Theory, I use the term 'semantic' in its etymological sense from the Greek '*semantikos*': a signification, an act of signifying. Semantic dynamics refers to the creation of meaning and significant cognitive acts. As this theory points out, all cognitive processes and acts are essentially meaningful and thus generate meaning.

[2] Conative processes are specific cognitive processes implying anticipations, expectations, intention, and goals. See the distinction introduced by Daniel Dubois (2001) in his research on anticipatory systems: "Strong anticipation refers to an anticipation of events built by or embedded in a system. Weak anticipation refers to an anticipation of events predicted or forecasted from a model of a system."

[3] Semantic cognitive processes are modifying the part of reality that is known to the cognitive agent, and thus creating a "local universe" (Hardy, 1998).

[4] This book contains both Jung's essay on synchronicity and Pauli's "The influence of archetypal ideas on the scientific theories of Kepler. On Pauli, see also: Atmanspacher H. & Primas H. 1996. The hidden side of Wolfgang Pauli, *Journal of Consciousness Studies, 3* (2).