Natural Communication
The Obstacle-Embracing Art of Abstract Gnomonics

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Book Abstract

The main motivation behind setting up and articulating the theoretical model of "natural communication" in a book of this form emanates from the intention of the author to criticize, and transcend the current, "target-oriented" complexity science paradigm, by proposing and elaborating an alternative one, envisioning and implementing a fundamental architectonics of communication. The proposed model of "natural communication" encapsulates modern theoretical concepts from mathematics and physics, in particular category theory and quantum theory correspondingly, not for the sake of a technical formalization, but in order to abstract accurately basic notions that lead to a conceptual appreciation of this theory, and additionally, make it possible to re-consider and re-evaluate novel ways of thinking about complexity deeply-rooted in the past, which have been unfortunately, either oversimplified and distorted, or forgotten and left to oblivion. It is the belief of the author that only by looking to the past, makes it possible to establish a continuity and coherence in our current way of thinking, in particular regarding complexity, which is the pre-condition for any serious future development on these matters.

The primal realization underlying the generative reason of this treatise is that a certain architectonics of relations based on communication is ultimately necessitated in all cases, where direct accessibility to sharply distinguishable domains of objects and their behaviour is not feasible, due to obstacles or obstructions of any particular type. In these domains, objects are intrinsically shaped according to foamy or cloudy patterns, and they are characterized by topological plasticity, emergent properties and generically probabilistic attributes. The application of pre-specific, readily-tailored design ontologies to these domains, based on the reductive notion of some hypothetical sharply-distinguishable elementary constituency, not only distorts the architectonics of their non-trivial connectivity patterns, but limits and restricts, even inadvertently, the potential to unravel their rich computational capacities. In this manner, the notion of computation cannot be disentangled from the architectonics of relations based on communication. In the opposite case, complexity is reduced to a particular form of complicatedness due to mixing hypothetical elementary constituents, with the end result of treating information exclusively in terms of statistical data attributes, depriving effectively these domains from the possibility of manifesting genuine novelty.

The basic idea proposed in this book to address and utilize the architectonic modelling of not directly accessible, or more generally, obstacle-laden domains, is the following: Instead of analysing them in terms of constituent set-based elements and their hypothetical absolute

relations, adjoin to them other adequately-understood or directly accessible domains, which can provide pointers and open up communication channels with the former ones. The process of adjoining should not be ad-hoc and should not depend on artificial choices, meaning that it should be qualified as structurally-respecting, at least, locally or partially. This refers to the "naturality requirement" of the model, a term which is exemplified in the context of category theory. Technically, this adjunction process can be always abstracted properly in terms of a pair of adjoint functors between the involved categorical domains.

The essence of adjoining in order to open up or potentiate communication channels is based on the idea of partial or local structural congruence, and implies a certain type of modularity in the treatment of obstacle-laden domains. It is deeply rooted in the old art of gnomonics, i.e. in the masterful articulation of sundials, calendars, and atlases, to probe some directly inaccessible domain and obtain information in modular relation with respect to the designed gnomon, by forcing or effecting a certain similarity or congruence relation.

In practice, the process of adjoining a controllable domain to another one, initially not directly accessible, or obstacle-laden categorical domain, amounts to viewing these domains as different categorical levels in a stratified universe of discourse, which are bi-directionally connected by means of opposite oriented bridges, to be thought of as communication channels. The architectonics of communication targets precisely the conception and explicit construction of these bridges, once suitable probing domains have been structurally delineated for adjunction to the directly inaccessible domain. The bridge directed to the controllable domain plays the role of an encoding bridge, whereas its inverse plays the role of a decoding bridge.

These connecting bridges effect the communication between the involved domains, in the sense that they naturally establish universal bidirectional communication channels through which a holonomic schema of metaphora is accomplished, based on the notion of an "obstacle-encircling" flow. Topologically thinking, the initially inaccessible categorical domain is resolved cyclically by a process of unfolding with respect to the probing domain that has been adjoined to it. In this manner, the invariants emerging by the process of unfolding depict the invariant characteristics of the reciprocal communication flow between these domains.

Consequently, the complexity of the not directly accessible, or obstacle-laden, domain is not specified constitutionally on the basis of a pre-assumed or axiomatic elementary ontology, but relationally, modularly, and, in the technical sense naturally, in terms of the invariants emerging in the bidirectional communication flow established with some appropriate probing domain. From an algebraic viewpoint, these invariants can be qualified in terms of structural group-type ciphers for the symbolic encryption/decryption of the induced flow.

The obstacle-embracing schema of metaphora giving rise to this cyclic flow, called the "logical conjugation method", is always implemented on the basis of a legitimate logical manoeuvre through controllable or directly accessible domains – adjoined to an obstacle-laden domain as markers or pointers, providing eventually the means of specifying it

indirectly through communication. The logical conjugation method should be thought of in terms of a “motivic key” that bears the capacity to unlock harmonically the complexity of the inaccessible domain depending on the nature and type of the obstacle encountered. The thing to be emphasized is that it always gives rise to a partition spectrum of the latter. Each cell of this spectrum is characterized completely by the pair of encoding/decoding bridges utilized for communicating an aspect of the directly inaccessible domain with respect to some probing domain.

The creative art consists in the innovation of genuine bidirectional encoding and decoding bridges between these two domains that make possible the instantiation of a cyclic communication flow capable of embracing the present obstacle. In this manner, the theoretical model of “natural communication” is deeply rooted conceptually to the old art of gnomonics, and it is meant as a continuation of this paradigm, articulating a schema of an “abstract gnomonics” in a modern theoretical scientific context.

For all practical purposes, the model of ‘natural communication’ can be implemented briefly as follows:

We consider a problem in the context of a domain whose objects and relations are directly inaccessible. It is instructive to think of this domain as a particular level in a broad universe of discourse, which can engulf other possible levels as well. First, we move out of the context of the problem, formulated at the level of the inaccessible domain, by adjoining to it another controllable domain, assuming existence within the same universe. In order to accomplish this, we have to set-up an encoding bridge from the level of the inaccessible domain to the level of the accessible domain, such that some certain form of congruence can be established between these domains.

Once, we have succeeded to set up this bridge, we are able to mirror the initial problem at the level of the controllable domain, where we have the means to address it effectively. The process is completed by setting up an inverse decoding bridge from the level of the controllable domain to the level of the inaccessible one. In this way, the available means or knowledge pertaining to the controllable domain can be lifted at the initial context of the problem. Thus, the pertinent problem can be effectively resolved in the context of its initial formulation by the embracing of the obstacle it engulfs via the communications channels established with the other domain. The reciprocal encoding and decoding bridges constitute the means of a novel architectonics of communication.

It has to be stressed that this procedure can be iterated by the involvement of more than one controllable domains adjoined jointly to the inaccessible domain. The skeleton of this spectral resolution process remains invariant under the adjunction of deeper levels, and most important, it always gives rise to a partition spectrum of the inaccessible domain, amenable to possible refinement, whose cells are indexed by the respective pairs of encoding/decoding communication bridges.