Chapter VII

What Determines the World:
Causality as the Life-or-Death Relationship

Introduction

The world or reality is the totality of things diversified into a multitude of collections of sub-worlds with the characteristic constraints and boundaries; all determined by the fundamental causal laws. Accordingly, the logic of reality is ultimately one; for there cannot be many logics of the universe. Although many personal perspectives allowed, and particular truths, special things and meanings, the global logic of reality is a single universal consistent system relied on a set of ontological classes and relationships, fundamental rules and laws.

The universe is a deep, dark secret, mysterious and mystifying to human minds. And the fundamental challenge to the human mind is to provide a comprehensive account and model that explains in noncryprical terms how this unbounded environment changes and how its basic constituents causally related, and so forth. And this is all the legal responsibility of the UFO as a **causal dynamic ontology,** formulating the causal rules of world behavior as fundamental laws by establishing underlying regularities, uniformities, invariants, and cor-relations. So guiding science and technology, the task of dynamic ontology is to give us the overall structures, uniformities, patterns, laws, constraints, and invariants within which the many changes in the world take place, finding out what it is outside and inside, defining the natures and essences common to the denumerable multitude of individuals, by classifying the whole universe of things into the prime categories, classes, kinds and relationships.

The centerpiece of the universe is causality, the driving idea of the UFO; for comprehending the nature, meaning, kinds, varieties, and ordering of causes and effects amounts to knowing the beginnings and endings of things, to uncovering the implicit mechanisms of world dynamics, and to having the fundamental scientific knowledge. As to the real life reasoning

applications, understanding of causality and its mechanisms amounts to possessing by the intelligent systems a real life world model enabling all significant inferences, implications, entailments, and predictions thereof.

Of the whole range of real-world relationships, the relation of cause and effect, or causality, happens to be not only the most fundamental relation of reality, but also the most cryptic, mysterious, and challenging issue to the mighty human minds for many ages. It appears, as its long history shows, the arcanum of this vitally important, life-or-death relation dwells in that a comprehensive and consistent analysis of its nature, structure, and meaning can be given only within the general framework of reality. The extreme importance of causality is explained by the eventual purpose of all human inquiry to achieve the causal knowledge about the behavior of the real world, thus providing for versatile intelligent computing systems the common basis for causal representation and reasoning about natural phenomena and mechanisms, social processes, and engineering artifacts.

Fundamentally, causality is a life-and-death matter because of its significance for forming the truthful world view and discovering a set of fundamental laws governing the world. From the social perspective, causality and causally aware machines have a life-or-death significance for the vital issue of humanity survival through existing and newly emerging global, worldwide risks (societal, geopolitical, technological, environmental, and economic) via understanding their causal roots, mechanisms, dynamics, and interrelatedness (Global Risk, 2007).

It should be mentioned that of all the relations in the world the most attention is commonly paid to the part-whole relations, which, however important, make up only one kind of possible ontological relations. It is necessary to escape a widely popular illusion in ontological engineering to identify the taxonomic hierarchies of entity classes with the real ontology of things. Without causal relationships, "the cement of the universe," any general system of things might look a mere empty extension to the logical theory of types.

Humans are beings of various desires and wishes, but only one of them makes us so unique and particular and intelligent, the never satiated thirst for knowledge, driving the mighty minds and intellects from the ancient times. "All men by nature desire to know" the underlying causes and fundamental principles, so that to achieve the cardinal truths and universal learning of the universe, and if not to master but to understand the invariant principles and rules of behavior of this dynamic, emerging, evolutionary, nonlinear, ever-changing world within a unified causal framework.

A Unified Causal Theory: Causality, Inverse Causality, and Causation

By the generally accepted definition, *causality* is the relation between causes and effects. By its primary sense, it is a special sort of relationship, a special category, form, class, or family of associative entities sharing an inherent sameness. The main part of the definition, "causality is a relation that. . .," clearly implies that whatever essentially inheres in the relationship-in-general also must be affirmed of causality as its distinguished species. That

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