Chapter IV

Crucible of Synthesis: The Model of Knowledge, from Sensorial Signals to Architectures and Concepts

Why is the search for the basic unit of knowledge possible and necessary, even when separated from larger philosophical and scientific questions? There are three main reasons. First, one such problem deals with the process by which knowledge is gained about the external world and rational beings interact with their external environment. A second problem examines the existence or ontology of this external world: is it real or an artifact of the mind? Thirdly, another area of inquiry concerns the degree to which we can trust our senses. Are the inputs we receive from the external world “true” representations of the external reality?

In any of these instances, the basic unit of knowledge is a component of the mechanism of search and inquiry. Whatever the unit we determine to be the basic element of knowledge, its being in itself would not impact the theoretical foundations of the inquiry into larger more complex problems, to the extent that they would be refuted.1
A model of knowledge based on the elemental unit of knowledge would be later linked to the issues involved with the macro approach to knowledge. Figure 1 shows the three main components of the search for the nature and progress of knowledge.

The conceptual as well as temporal distance between the micro approach (the basic unit) and applications in the macro world of knowledge systems are mediated by the use of modes and mechanisms of linkage or exchange. There are tools of communication, semantics, language, and semiotics. Human interaction and human society and its survival depend on the effective utilization of these mechanisms for the exchange of knowledge—from its basic unit to the complexity of systems.

As in physics, perhaps the rules or principles present within the micro perspective may be different from those that apply to the macro perspective. Polanyi (1966) and scholars who followed tend to differentiate between the two perspectives primarily in terms of “tacit” and “explicit” knowledge. But, the differences are more salient and complex than simply these two categories. There are profound distinctions in the nature of knowledge, so that its transfer from the individual to higher-order systems becomes a conceptual and structural endeavor of low probability and extreme difficulty, hence the crucial role that the mediating modes of communication play in this phenomenon.

In order to understand these critical differences, it becomes necessary to explore the nature of knowledge and its elemental building blocks. This is similar to nuclear physics to delving into the secrets of sub-atomic particles and their constituent elements.

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**Basic Elements of Knowledge**

The model proposed in these pages is based on two complementary approaches. The first introduces the question: What constitutes the fundamental components of what we know? The second deals with the process and method by which such fundamental components may form a more complex or an initial construct of knowledge. This process or method is not yet an exploration of the progress of knowledge. Rather, it focuses on the composition of the structure of knowledge: from the most fundamental unit we can envision,
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