Epilogue

Reflections on Theories of Information, Knowledge and Decision

The foundational principle behind the analysis and synthesis of the signal disposition is that the creation of data, fact, evidence and acceptance of true-false claims in knowledge production, just like any human activity, is a decision-choice process under the control of cognitive agents. Such a decision-choice process is an input-output process. The inputs are costs and the outputs are benefits, both of which are reversible depending on situations and circumstances in which one finds oneself. The analytical system that has been projected in this monograph is that signal disposition is seen as input and knowledge is seen as output. The movements from information to knowledge are substitution-transformation processes of the signal dispositions that involve the behavior of the dynamics of actual-potential polarity. The basic raw material for the knowledge development in the epistemological space is the characteristic-signal dispositions the cognitive manipulations of which give rise to fuzziness and randomness in the development and management of human and non-human affairs. The fuzziness expresses itself in the resolution of conflicts in the degrees of accuracy of acquaintance with qualitative disposition while the randomness expresses itself in the resolution of conflicts in the degrees of accuracy of acquaintance with quantitative disposition. The qualitative disposition is seen in vagueness, misinformation, disinformation, approximations and intentionality. The quantitative disposition is seen in terms of volume limitations in acquaintance and approximation. It is the character of disinformation and misinformation in the process of knowing that separates essentially social information and knowledge from scientific information and knowledge through the establishment of the distribution of either the degrees of doubt or surety that may be attached to the results of knowing for acceptance.

Given the organic signal disposition, the problem-solution structures of decision-choice processes depend on the signal disposition and instruments of reasoning which generate an input-output process that defines the success-failure history of the organic knowledge-decision-choice process over the epistemological...
space composed of the multiplicity of systems dynamics. The individual signal disposition relates to the information-knowledge process of either an individual variety or individual categorial varieties. The nature of the success-failure history is more affected in social information-decision-interactive processes by disinformation and misinformation in the process of knowing than the success-failure history in the natural sciences. This differential effect of disinformation and misinformation is due to social intentionalities in relation to power as expressed in time-dependent preferences, resource distribution and continual creation and transformation of old and new social varieties on the basis of the interactive process of knowledge and decision-choice actions over the epistemological space. Over the ontological space, the knowledge-decision-choice actions that bring about creation, destruction and transformation of natural varieties are under the direct works of nature and out of the control of the existence of cognitive agents, and hence misinformation and disinformation are non-existing in the knowing process. Here, the cognitive agents are themselves the subject of natural transformation without their ability to control the final outcome.

Things are different over the epistemological space, where cognitive agents operate under all kinds of cognitive conditions such as intentionalities, preferences, power acquisitions and many others. Here, the knowledge-decision-choice actions that bring about creation, destruction and transformation of social varieties are under the direct and indirect controls of cognitive agents who must work with the signal dispositions, acquire knowledge, and use it as input for actions to satisfy their intentionalities with individual and collective preferences. The development and uses of misinformation and disinformation to create propaganda are the principal tools of manipulation for advantage in the creation of new social varieties and transformations of old social varieties in the substitution-transformation process of the social actual-potential polarities in the conflict zones of collective preferences. In the substitution-transformation processes, the space of socio-natural knowledge-decision-choice possibilities is just as expansive as the space of the universal transformation possibility of varieties. Every old variety or every new variety is under the information-knowledge principle of stock-flow disequilibrium in destruction-construction processes. Nothing in the universal system can be exempted from this organic process of transformation. A transformation of any element is the destruction an existing variety and the retention of information regarding its previous existence. A transformation of any variety into a new variety is a creation of new information and an increase of the stock of information.

Information-decision-choice-interactive processes through input-output structures of knowledge production and fulfilment of intentionalities are the dominant epistemic culture over the epistemological space. It must be made clear that conceptualization and representation of information are composed of the general definition of the concept and phenomenon which provides a number of advantages in human action. The definition of the concept of information that fixes the boundaries of the phenomenon of information unifies all areas of knowledge under one general logical search process of constructionism-reductionism methodological duality within the framework of theoretical and applied modalities in the social space of
actions. Theories and models in social sciences, theories and models in natural and physical sciences, theories and models in biological sciences, theories and models in engineering sciences and many others work with signal dispositions as their inputs of epistemic manipulative processes to derive specific results by the methodological constructionism. Over the epistemological space, these results are the epistemological varieties and categorial varieties whose validities must go through either verification, falsification or corroboration with the elements in the ontological characteristic dispositions by methodological reductionism. It is the organic epistemic process and individual epistemic processes over different areas of cognitive search that provide a constrained picture of the universe at any time, with continual variety transformation dynamics over the infinite horizon of continual information production and storage that form the foundations of knowledge dynamics [R4.13, R8.44, R8.14, R8.16, R8.54]. The explanation of the dynamic picture of information and knowledge may be seen through categorial conversion defining the necessary conditions of transformation, and philosophical Consciencism defining the sufficient conditions of transformation under constructionism-reductionism duality, where every epistemic construction has a corresponding epistemic reduction in relational continuum and unity [R17.15, R17.16].

It is the existence of interactive information-knowledge structures in all areas of informing, knowing, learning and teaching in time and over time that provides us with a framework to divide all theories into two categories of explanatory and prescriptive varieties. The nature of these theories relates to the manner in which the characteristic-signal dispositions are treated under epistemic actions. The focus of the category of explanatory theories is on the destruction of existing varieties and the explanation of the behaviors of existing varieties under their characteristic-signal dispositions. In this respect, any explanatory theory may be devoted to examining inter-categorial behaviors or intra-categorial behaviors or both in all areas of knowing. The focus of the category of prescriptive theories is on the destruction of existing varieties and the creation and transformation of new varieties from the use of characteristic-signal dispositions as inputs into decision-choice systems. The creation and transformation of new varieties may be inter-categorial or intra-categorial or both. The category of prescriptive theories includes theories of engineering and planning and others that act on social actual-potential polarities.

The inter-categorial relations of varieties are qualitative in nature while the intra-categorial relations of varieties are quantitative in nature. For example, a prescriptive theory may be about a transformation of one qualitative variety to another on the basis of their qualitative characteristic-signal dispositions. This is inter-categorial transformation in that there is qualitative movement between two different categorial varieties. A prescriptive theory may be about a transformation of one quantitative variety to another within the same category on the basis of quantitative categorial-signal disposition. This is intra-categorial transformation in that there is quantitative motion between the same varieties in the same category.

This explanatory approach defines an integrated epistemic framework of the explanatory process for construction and understanding of the _general theory of unified sciences_, while the prescriptive framework defines an integrated epistemic
framework of the prescriptive process for the construction and understanding of the general theory of unified engineering sciences in the destruction-construction processes of varieties. It is useful to understand that the general theory of unified sciences with its practices is unbreakably linked to the general theory of engineering sciences and practices over the epistemological space by methodological nominalism in the field of languages that codify and de-codify the signal dispositions from the characteristic dispositions.

The concepts of variety, categorial variety, intra-categorial movement, inter-categorial movement, qualitative characteristic disposition, quantitative characteristic disposition, actual-potential polarity, qualitative disposition, quantitative disposition and others provide foundations for the development of the philosophy and mathematics of information that is not restrictive and closed but open and dynamic, connecting variety-existence to information, to knowledge-development, to decision-choice action, and to creation-destruction action of variety under certain principles of ethics and dynamics of organic and individual quantitative-qualitative dispositions. In this respect, philosophy of information is just as old as philosophy of knowledge whether constructed or not. Every theory of knowledge, irrespective of the area of knowing, has an underlying theory of information or an implicit concept of information on which some epistemic operation is applied to obtain knowledge.

The true-false duality either with excluded middle and disunity or with relational continuum and unity has no existence without information. The philosophy and mathematics of information as is seen in contemporary times must not be restricted to the domain of computational systems and quantitative processing in specific areas such as biomedical information, or informatics and related areas. As has been discussed, data is a derivative from the signal disposition and acquires meaning in the specificity of categorial varieties in the area of investigation as a sub-set of the set of universal varieties. In this respect, the area of informatics is concerned with the science of signal disposition where all types of information systems are sub-derivatives from the signal disposition as the primary element. The differences among the subject areas of knowing reveal themselves as the differences in the defining characteristic dispositions that are subjectively imposed to create varieties of knowing and knowledge areas. In this way different disciplines of research, teaching and knowing are cognitively established for efficiency and specialization.

Critical examination of decision-choice processes, information, knowledge and input-output processes over the epistemological space leads to a number of important questions the answers of which will provide us with the meanings of informing, knowing, learning, teaching, deciding and choosing in the space of human thought and practice under the guidance of a constructed rationality. It has been argued that knowledge is a derivative from information as a primary category of knowing. Informing over the epistemological space is a derivative from the signal disposition. The activities of learning, teaching, deciding and choosing are all at the mercy of the organic and specific information-knowledge processes. Every paradigm of thought is an epistemic information processor under a cognitive action in the search of a variety or categorial varieties to add to the stock of knowledge,
and hence every paradigm of thought is useless without information; in fact, without information it is a mirage and vicious in cognition and decision. The development of language is impossible without the existence of ontological varieties the identities of which are defined by their characteristic dispositions and revealed by their signal dispositions. It is the universal existence of ontological varieties that gives meaning to research works in informing, knowing, learning and teaching. This universal existence finds meaning and expression in matter. The changing nature of this universal existence and movement finds expression and meaning in energy as a derivative from matter. It is through the existence of the ontological signal dispositions that the epistemological space is connected to the ontological space by acquaintance.

All definitions in all languages including ordinary and abstract families in theoretical and non-theoretical constructs are about establishing differences, similarities and identities of varieties which is information derived in scientific and non-scientific spaces to give meaning to nominalism in relation to the particular and universal. Vocabulary is about establishing identities and meanings of representation of the phenomena and objects of the form \((\phi \in \Phi, \omega \in \Omega)\) where universality and particularity are in relational continuum and unity of existence to establish varieties. Thus one can distinguish thermodynamics and the corresponding subfields from electrodynamics and corresponding subfields as established by their characteristic-signal dispositions of the nature of their being. How does one know the difference between chemistry and economics, and political science and philosophy? Similarly how does one know that the phenomenon \(\phi_1 \in \Phi\) and the corresponding object \(\omega_1 \in \Omega\) have been discovered instead of \(\phi_2 \in \Phi\) and the corresponding object \(\omega_2 \in \Omega\)? Their differences and similarities are revealed by the differences of their characteristic-signal dispositions as defining the information structures. It may be kept in mind that by the principle of stock-flow disequilibrium of information, the particular variety finds existence in the universal variety (categorial varieties) and the universal existence of a variety (categorial varieties) finds expression in the particular variety.

Explication in vocabulary is simply to limit the applicable range of meaning as applied to a specific variety and area of thought especially in science and technical areas. Language in all forms is a tool and a vehicle to make the source-destination process of communication of information possible. In the discussions, the conditions on the basis of which information, data, fact, evidence and knowledge are established as well as explained in terms of primary and secondary conceptual derivatives that are intimately connected. It has also been argued that cognitive systems make decisions and choices on the basis of knowledge and not on the basis of information. In this respect, all constructed types of decision-choice rationality are claimed knowledge-supported by defining belief platforms for actions. The transformation decision-choice actions in the ontological space is done by nature itself who uses information because information is knowledge and knowledge is information that requires no processing. The transformation decision-choice actions over the epistemological space is done by cognitive agents with observational
limitations and epistemic constraints with which they must process defective information into defective knowledge elements that become inputs into the transformation decision-choice process. It is here that unintended consequences may arise from decision-choice actions. The ontological and epistemological transformation processes have necessary and sufficient conditions. The necessary conditions are established by Categorial Conversion [R17.15] while the sufficient conditions are established by Philosophical Consciencism that provides a guidance to the decision-choice systems with intentionalities [R17.16].

The necessary conditions are external and provide external indication for internal transformation. The sufficient conditions are internal to any variety and indicate the set of internal actions to transform. It is here that a relational structure is established between necessity and freedom, and between freedom and decision-choice actions related to social transformations. In the decision-choice space, necessity defines the cost space and freedom defines the benefit space. At the level of human experience and practice, necessity defines conditions of cost that must be transformed into benefit through freedom of decision-choice actions. Human existence finds meaning in solving the problem of freedom maximization subject to necessity. The actual practice is to maximize benefits subject to costs in variety transformations. The necessity-freedom conditions and the cost-benefit process find expression in the dynamics of the problem-solution process that generate epistemological information in time and over time.

Every decision-choice action is about a resolution of conflicts between the actual and the potential varieties, where the actual variety is defined by the internal real cost-benefit conditions relative to the necessity, and the potential variety is defined by the internal real cost-benefit conditions relative to the internal freedom. The process involves the behavior of information stocks and flows concerning varieties and categorial varieties where a transformation is a transformation of real cost-benefit conditions as revealed by information behavior over time space. The conceptual system for the understanding of this information behavior over time space requires the development of the theory of info-dynamics, the subject matter of which will be dealt with in a follow up monograph. In this possible epistemic development of the theory of info-dynamics, time enters as the fourth dimension in addition to matter, energy and information for the construct of the theory, where the cost-benefit tradeoffs are defined in terms of the opportunity costs of variety transformations [R5.13, R5.14].

The monograph of the theory of info-statics as definitional foundations of information begins with a preface and prologue on the nature of the set of problems of the general theory of information in relation to decision-choice systems. The general theory of information is divided into the theory of info-statics and the theory of info-dynamics. The subject coverage of the theory of info-statics deals with the definition of information to answer the question of what information is and is not for any given time point. The core of this definition is to establish the conditions that allow varieties to be distinguished by difference and varieties to be
grouped by similarities and commonness. The difference and similarities are established by partitioned characteristic sets which are essential in decision-choice systems under certainty-uncertainty duality as well as source-destination duality in information transmission and communication. The theory of info-statics ends with an epilogue which is composed of reflections on theories of information, knowledge and decision to provide the required conditions for an entry point into the development of the theory of info-dynamics. The conditions of the theory of info-statics initializes the conditions for the dynamics of the information process. The theory of info-dynamics which is about the production and reproduction of information associated with the transformational dynamics of varieties and categorial varieties will be taken up in a separate monograph.
Multidisciplinary References

R1. Category Theory in Mathematics, Logic and Sciences


**R3. Exact Science, Inexact Sciences and Information**


**R4. Fuzzy Logic, Information and Knowledge-Production**


R5. Fuzzy Mathematics and Paradigm of Approximate Reasoning Under Conditions of Inexactness and Vagueness


R6. Fuzzy Optimization, Information and Decision-Choice Sciences


R7. Ideology, Disinformation, Misinformation and Propaganda

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R8. Information, Thought and Knowledge


[R8.2] Afanasyev, Social Information and Regulation of Social Development, Moscow, Progress, 1878.


**R9. Languages and Information**


**R10. Language, Knowledge-Production Process and Epistemics**


R11. Possible-Actual Worlds and Information Analytics


R12. Philosophy of Information and Semantic Information


R13. Planning, Prescriptive Science and Information in Cost-Benefit Analysis Analytics


R14. Possible-Actual Worlds and Information Analytics


R15. Rationality, Information, Games, Conflicts and Exact Reasoning


R16. Social Sciences, Mathematics and the Problems of Exact and Inexact Information


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R17. Transformations, Decisions, Polarity, Duality and Conflict


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R18. Vagueness, Approximation and Reasoning in the Information-Knowledge Process


R19. Vagueness, Disinformation, Misinformation and Fuzzy Game Theory in Socio-Natural Transformations


R20. Weapon Foundations for Information System


R21. Written and Audio Languages and Information


