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Kofi Kissi Dompere

The Theory of Epistemic Fields

Fuzzy-Semantic Foundations
of Intellectual Categories and
Knowledge Factories

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DEDICATION

To all scholars, researchers, students and supporters working on the epistemic foundations of Information-Knowledge connectivity to the system of neuro-decision-choice spaces of human behaviors over the spaces of problem-solution, question-answer and success-failure dualities, and their connections to the spaces of natural and non-natural transformations under relational continuum and unity for the continual construction of methodological approaches with methods and techniques to the understanding of the development of our universal knowledge systems and total intellectual heritage of humanity to the benefit of organization of societies in setting peace against war and nonviolence against violence peace against war as well as working very hard for the living and praying hard for the dead.

To Patrice Lumumba, Thomas Sankara, Samora Machel
Robert Mugabe, Ahmed Sékou Touré, Modibo Keita, Ahmed Ben Bella,
who had the courage and vision,
to work to help to decolonize Africa,
and to set the new face of Africa's complete emancipation
under information-knowledge and problem-solution disequilibrium states.
Finally, to Fella Anikulapo Kuti,
The Great African musician and liberation activist as a true African
With music is a weapon and water has no enemy

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The theory of rational process, also characterized as the theory of rationality, depending on collectively acceptable rules over the space of thinking-reasoning dualities, irrespective of how it is conceived and interpreted, affects all areas of human thought and the derived laws of thought that may guide decision-choice behavior toward actions in managing our social set-ups in time and over time. There are many varieties of problem-solution dualities that constitute the space of problem-solution dualities for the construct of the theory of the general rational process over the space of ignorance-knowledge dualities to define the epistemic transversality conditions between opposites, where the theory of general rationality is defined under the conditions of unbreakable relations between information-knowledge and problem-solution dualities over the space of identification-transformation dualities. The space of identification-transformation dualities establishes the telescopic past in relation to past universal existence of *what there was* , telescopic present in relation to present universal existence of *what there is* and telescopic future in relation to *what there would be*, where *what there was* defines the structure of *what there is* which defines the conditions of variety and categorial identities for initializing the conditions of (info-static [R17.17], categorial conversion and necessity [R17.15]) for *what there would be* (info-dynamics [R17.18], philosophical consciencism, freedom and sufficiency [R17.16]) in Sankofa-anoma conceptual system of forecasting from the past, discounting from the future and deciding in the present to set the conditions of variety future. Thanks to those working on category theory in philosophy and mathematics and similarly those working on conflicts, tensions, and

principle of opposites with dualities and polarities for the understanding of general dynamics.

In all the neuro-decision-choice actions, the Sankofa-anoma conceptual systems under the principle of opposites with relational continua and unity establish a universal principle of past-present-future connectivity in an unbreakable chain of universal information-time interdependencies of variety give-and-take sharing modes over the space of identification-transformation dualities, where the fuzzy paradigm finds its methodological and analytical residence and power. In this respect, I thank all those involve in the development of paradigms of thought to help our understanding of our agreements and disagreements on collective thinking and reasoning as well as the understanding of the meaning of information-knowledge conditions in relations to uncertainty, identity and change and their relational connectivity to the spaces of destruction-construction and input-output dualities as well as to recognize the limitations of paradigm of thought. Important thanks to all working to prevent the greatest danger to integrity of the process of individual and collective knowing and information-knowledge development is the process of destruction of the conditions of thinking process which forms the foundation of reasoning over the space of problem-solution dualities to evade the social constraints of ideological faith and scientific credulity on thinking-reasoning dualities.

Special thanks go to friends, critics and those who have taken interest and time to read any of my monographs, whose positive and negative encouragements respectively have made this work enjoyable to the finish. My thanks also go to all my graduate students at Howard University in my courses in economic theory, mathematical

economics and cost-benefit analysis for allowing me to introduce them to new techniques and logic of thinking and reasoning in the space of relativity with inexact information structure and the use of cost-benefit methods and techniques with attempts to free them from the rigid logical structure of the classical system over the space of absoluteness with exact information structure. Once again, I express grate appreciation to Ms. Jasmin Blackman for prove-reading the manuscript from beginning to the end. I accept all responsibilities for all errors.

EPISTEMIC FIELDS

PREFACE

I: REFLECTIONS ON CONCEPTS AND DEFINITIONS

This monograph is an epistemic continuity of my examination and development of the theories of information and knowledge as economic production and not as communication. It is special in the sense that the examinations and discussions combine conditions of neuro-decision-choice actions for knowing and conditions of information-knowledge production as interdependent social production, the results of which are inputs to all areas of socio-economic production of the social system of varieties in the space of input-output dualities. As a general neuro-decision-choice over the socio-economic space, the transformation processes and their inputs must be specified, and similarly, the outputs of the input transformation processes must be specified. The distinguishing conditions of the inputs and outputs of the transforming processes must be explicitly specified and stated for categories to establish a framework in examining conditions of categorial conversions, where varieties of categories lose their identities and enter new categories. Here, two organic conditions must be developed: one is category formation, and the other is categorial conversion.

The category formation leads to the theory of categorial conversion under either the classical paradigm of thought, the fuzzy paradigm of thought or the hybrid, where necessity and initial conditions are established through a system of neuro-decision-choice actions over the identification problem-solution dualities [R17.15] [R17.17]. The categorial conversion leads to the development of the theory of transformation processes that connects categories, where the developments of factors show the arrow dynamics among categories and the development of the theory of philosophical consciencism to establish sufficient and freedom conditions of intra-

categorial and inter-categorial conversions over the transformation problem-solution dualities [R17.16] [R17.18]. The phenomena of variety identifications and variety transformation are treated as the general problem-solution dualities. In other words, the general knowing process and information-knowledge accumulation are about *variety identification* and *variety transformation*.

The variety identification problem-solution dualities are related to what there was and what there is over the space of telescopic past-present dualities. The variety transformation problem-solution dualities are related to *what there is* and *what there would be* over the space of telescopic present-future dualities, or, in general, are related to *what there was*, passing through *what there is* to *what there would be* over the Sankofa-anoma information-knowledge trinity of telescopic past-present-future structure, where the present resides in the past and the future resides in the present, and the past-present conditions shape the future structures over the space of imagination-reality dualities. The human intellectual efforts are about the neuro-decision-choice actions over the space of variety identification-transformation dualities to develop information-knowledge stocks for their uses against surprise, increase outcomes in the space of anticipation-expectation dualities, and the development and management of organizations and their institutions, where the institutions are specific in their problem-solution dualistic-polar structures in the epistemic field contained in the space of relativity-absoluteness dualities under a given paradigm of thought, where such paradigm of thought must be explicitly stated. The development of the paradigm of thought and its laws of thought and reasoning must be made explicit in relation to categories as departments in the epistemic field.

The neuro-decision-choice actions acquire increasing efficiency under the principle of sequential actions with relational connectedness under the give-and-take sharing principle in a state of oneness over the space of problem-solution dualities. The sequential actions require

creating sets of problem-solutions with similar characteristic dispositions by an appropriate method of indicator function into either fuzzy decomposition or classical decomposition into categories, where the collection of these categories constitute the epistemic field and the epistemic field embedding with intra-categorical and inter-categorical relations and transformations with dynamic relations and information. The intra-categorical and inter-categorical give-and-take sharing relations are dynamics that allow categories to be combined as well as to be divided to serve the knowing and information-knowledge development through neuro-decision-choice actions over the space of problem-solution dualities.

Let us keep in mind that the correct and incorrect identifications of variety problems and variety solutions belong to the space of identification problem-solution dualities, where the variety identifications reveal variety identities and behaviors in static states, and the results of knowing through the neuro-decision-choice actions generate information-knowledge conditions of telescopic past (*what there was*) and telescopic present (*what there is*). Similarly, the correct and incorrect transformations from variety problems to variety solutions belong to the space of variety transformation problem-solution dualities, where the variety transformations reveal changes in variety characteristic dispositions in identities and behaviors in dynamic states, and the results of knowing through the neuro-decision-choice actions generate information-knowledge conditions of telescopic future (*what would be*), where new epistemic fields are induced. The space of variety identification problem-solution dualities and the space of variety transformation problem-solution dualities are contained in the space of imagination-reality dualities, where variety problems belong to the space of realities contained in the space of actuals, and the space of variety solutions belongs to the space of imaginations which is contained in the space of potentials, all the varieties of which are defined by their characteristic dispositions.

II: THE SPACE OF ACTUAL-POTENTIAL DUALITIES AND THE SPACE OF IMAGINATION-REALITY DUALITIES

The most important epistemic structure is the understanding of the nature, structure, differences, and similarities of all the spaces as defined and their relationships to one another and to the space of ontological-epistemological dualities, and how the ontological and epistemic spaces are abstracted from the space of ontological-epistemological dualities under the conditions of the general principle of opposites with relational continuum and unity. The ontological space contains the space of actual-potential dualities. The epistemological space contains the space of imagination-reality dualities. All the space of imaginations is contained in and abstracted from the space potentials to create a relational continuum and unity with the space of realities. All-natural activities directly take place over the ontological space. All neuro-decision-choice actions and social behaviors take place over the epistemological space that is relationally connected to the ontological space for knowing and information-knowledge accumulation. Unlike the natural processes over the ontological space, complications arise for neuro-decision-choice actions over the epistemological space. These complications are generated by indirect processes for the neuro-decision-choice actions to connect the epistemological space to the ontological space through the space of imagination-reality dualities to which we now reflect on.

III: THE SPACE OF IMAGINATION-REALITY DUALITIES, POSSIBILITY PROBABILITY, POSSIBLE WORLD, AND IMPOSSIBLE WORLD

The relational connectivity of possibility, probability and the space of imagination is presented to resolve certain misunderstanding and confusion about the concepts and measurements of possibility, impossibility, probability and improbability, and how the concepts of possibility and probability may be extended to the concepts of possible world, impossible world and the space of possible-world-impossible-world dualities under the principle of opposites and a system of

thinking and reasoning. Some of the elements in the set of terms with confusion in the spaces of definitions and explications are probability, possibility, uncertainty, information and knowledge. The destination of a zero probability of an event as an impossible outcome is analytically troubling in the sense of neglecting the notion that an event may be possible and yet improbable. An improbable event is not necessarily an impossible event under dualistic-polar conditions within the principle of opposites in relation to the space of possibility-impossibility dualities and the space of probability-improbability dualities. Every variety belonging to the probability space also belongs to the possibility space, while every variety belonging to the improbability space belongs to the space of possibility-impossibility dualities in the sense that it may belong to either the possibility space or impossibility space. In this respect, the work done by Dubois and Prade is not only helpful but instructive in understanding possibilistic thinking and necessity relative to probabilistic thinking and freedom [R5.17] [R5.20]. It helps in the understanding of relational separation, continuum and unity of the space of possibility and the space of probability, as well as contributing to the development of the possibility-probability or the fuzzy stochastic hybrid conceptual view on the general uncertainty over the space of quantity-quality dualities and the use of possibilistic-probabilistic reasoning in understanding the behavior of uncertain outcomes in the space of varieties as is also reflected in [R5.19] [R21.5].

The concepts of possibility and probability are mutually creating in terms of likelihood of outcomes under cognitive capacity limitations in relation to an information-knowledge system and neuro-decision-choice actions of human behaviors over all spaces contained in the epistemological space. The cognitive capacity limitations over the information-knowledge system generate uncertainty of qualitative and quantitative dispositions of varieties over the space of imagination-reality dualities as a sub-space of actual-potential dualities. The uncertainties are contained in the

space of imagination, where there is the qualitative uncertainty and quantitative uncertainty. The qualitative uncertainty resides in possibility defined as the likelihood of variety anticipation and the collection of these variety anticipations is the possibility space for the construct of relevant fuzzy numbers and possibilistic reasoning. The concept of qualitative uncertainty is the difference of what would and what would not be of a variety in terms of characteristic disposition. The quantitative uncertainty resides in probability defined as the likelihood of variety expectation given the anticipation and the collection of all variety expectations constitutes the probability space for the construct of probability numbers and probabilistic reasoning. The hybrid of qualitative-quantitative uncertainty resides in the space of possibility-probability variety defined as the double likelihood of anticipation-expectation varieties, and the collection of all the simultaneous anticipation-expectation varieties constitutes the space of possibility-probability dualities for the construct of hybrid numbers and possibilistic-probabilistic reasoning in the space of fuzzy-classical paradigms of thought in knowing and information-knowledge production. The concepts of the double likelihood, the possibility-probability hybrid or the fuzzy-stochastic hybrid has given rise to the concept of probability of probability or imprecise probability or inexact probability over the space of subjective-objective dualities. These added qualifications on the concept and quantification of probability are due to cognitive capacity limitations from the space of acquaintance as well as the efficiency of the classical paradigm of thought which are linked to the space of imaginations containing the possibility as a primary category with probability as a derived category in the space of parent-offspring dualities.

The probability space, improbability space and the space of probability-improbability dualities are contained in the possibility space. This translates into the idea that the space of varieties with zero probabilities as improbabilities is contained in either the possibility space or

the impossibility space, and similarly, the space with positive probabilities is contained in the possibility space and hence by dualistic-polar conditions the space of probability-improbability dualities is contained in the space of possibility-impossibility dualities. In this respect, we may ask the question as to what role does the impossibility and impossibility space play in examining the neuro-decision-choice activities in the space of imagination-reality dualities as a sub-space of the space of actual-potential dualities. In defining the concepts of probability and possibility the concept of information is used without adherence to laws of definition and explication. For example, let us look at the following definition: *Uncertainty refers to epistemic situations involving imperfect or unknown information.* The definitions of corresponding synonyms and antonyms are similarly troubling. Uncertainty as involving imperfect information is meaningless unless we know what information is. This is the definition-explication problem of information in all areas of knowing, knowledge accumulation and neuro-decision-choice actions.

In all the discussions and theories on concepts and phenomena of information, probability, uncertainty, doubt, belief, decision, choice and many such elements in the space of production-consumption dualities, the nature and meaning of information are assumed as known and given where the phenomenon and the concept of information are continually set in equality with the concepts of knowledge, fact, data, and evidence. In this respect, the relational differences and similarities of these interrelated phenomena and concepts are neglected in epistemic processes in explanatory and prescriptive processes for amplification of uncertainties in all neuro-decision-choice processes increasing the zone of riskiness. In the development, understanding and communication of theories and applications, it is useful to follow the structures of the *phenomena*, concepts, definitions and measurements in all areas of knowing and information-knowledge accumulation. In this respect, what is the phenomenon of the concept of information? What is the

definition of the concept of information? What are the relationships among information and all the varieties, spaces, zones, categories, sets, fields, and neuro-decision-choice actions over the space of individual-collective dualities? Substantial clarification of what constitutes inputs and outputs into decision choice processes must be made explicit since these input-output processes are related to the spaces of successes-failure and risky-riskless dualities. Generally, knowledge is an input into neuro-decision-choice processes and information is an output of neuro-decision-choice actions which then becomes input into knowing and knowledge processes to produce knowledge as input into neuro-decision-choice actions over the problem-solution transitional dynamics of the interchangeabilities of problem-solution outcomes. The phenomenon, concept and the meaning of information and their relationships to the phenomena, concepts and meanings of fact, data, knowledge and evidence are discussed in [R17.17] [R17.18]. From these phenomena, concepts, definitions and the constructed spaces, uncertainties are generated from the differences and comparisons of the same variety with differences of characteristic dispositions in the space of actual-potential dualities and the space of imagination-reality duality, where the variety transitional transformations generate different uncertainties in the space of possibility-probability dualities which result from the conditions of the space of ontic-epistemic dualities. The organizational relations among the spaces are presented in Figure IIIA.

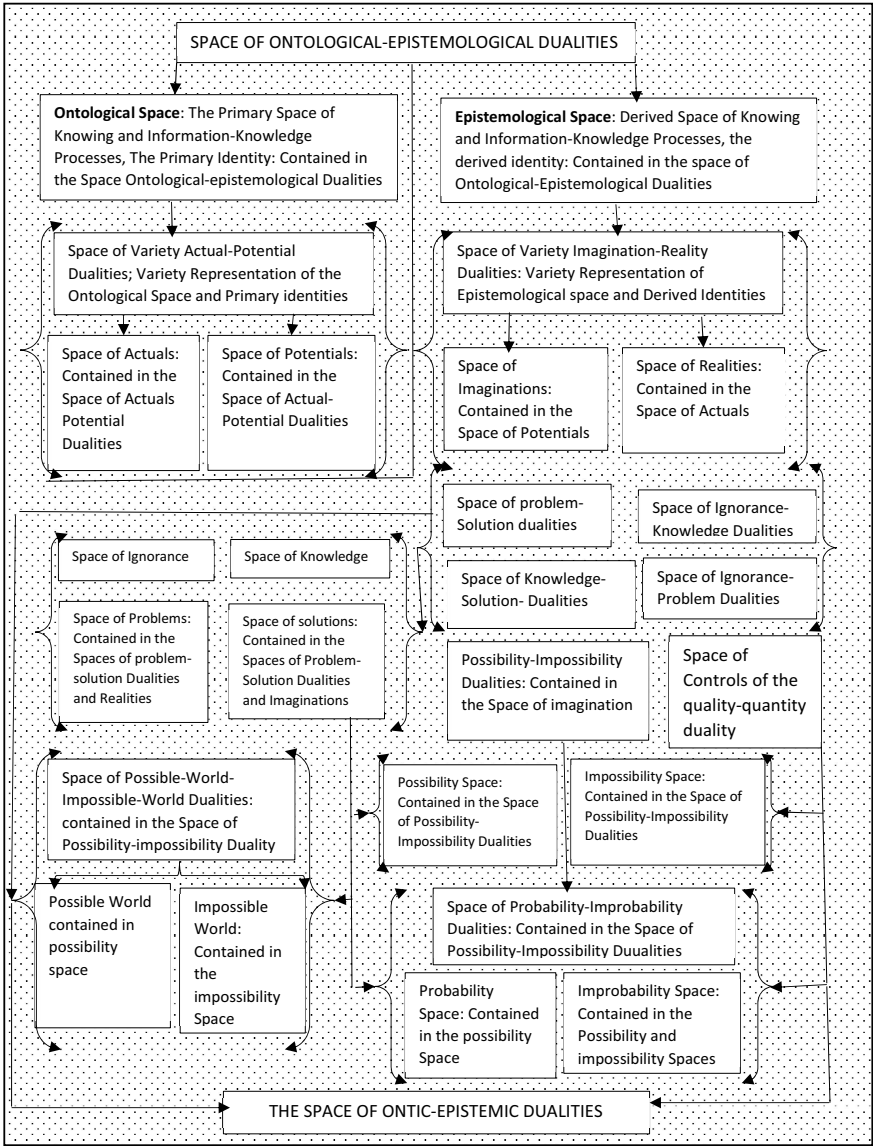


Fig IIIA ORGANIZATIONAL PAREMIOLOGY OF THE GEOMETRY OF SPACES AND SUB-SPACES FOR KNOWING, NEURO-DECISION-CHOICE ACTIONS AND INFORMATION-KNOWLEDGE PROCESSES UNDER THE GENERAL PRINCIPLE OF OPPOSITES

IV ANALYTICAL CONFUSIONS ON THE CONCEPTS AND PHENOMENA OF POSSIBILITY AND PROBABILITY

The confusions over possibility and probability, impossibility and improbability with corresponding spaces and possible world and impossible world center around the confusions on their phenomena and concepts. The differences and similarities of the concepts and phenomena concerning these varieties must be established for epistemic clarities in definitions and measurements with a clear understanding that the identity of a phenomenon proceeds concept, definition, explication and measurement and the roles they play in neuro-decision-choice actions over the space of imagination-reality dualities. The analytical system connecting all these ideas is made explicitly by the development of the theory of epistemic fields and epistemic field embeddings that will allow us to discuss phenomena and concepts, composition-decomposition aggregations-disaggregation over the space of relativity-absoluteness dualities with lexical elasticity and conceptual flexibility. This lexical elasticity and conceptual flexibility may be related to the Brouwer fixpoint theorem seen in the theory of definitions and mathematical representation relative to synonyms, antonyms, fuzzy set covering and linguistic flexibility in use and application in the family of ordinary languages (FOL) and not in the family of abstract languages (FAL). A variety in the space of imagination is said to be possible if it has a transformation function that converts variety imagination to variety reality. It is said to be impossible if such transformation function cannot be found. This transformation function is functor for each variety which is also defined in the space of problem-solution dualities in the epistemic field supported by relational and information fields the theory of which this monograph is about.

The theory of the epistemic fields with the supporting relational and information fields provides us with a self-contained framework to trace the epistemic journey over the space of

ignorance-knowledge dualities. It, further, allows a connectivity to how mathematical theories of category, functor and conformal mapping may help in the understanding of their applications to the intra-categorical and inter-categorical transformations as well as neuro-decision-choice actions with transitional uncertainties linking the space of problem-solution dualities to the space of cost-benefit dualities under the psycho-economic principle of non-satiation, where more is preferred to less for variety benefits and less is preferred to more for variety costs as analytical structures are imposed on the neuro-decision-choice behavior with cognitive capacity limitations over the space of identification-transformation dualities as we journey over the space of ignorance-knowledge dualities. In this respect, it may be useful to offer another definition with a corresponding explication of the possibility space through the conceptual system of both functor and categorical conversion, where a variety possibility may be defined in relation to either the space of functors or the space of categorical convertors in the sense that a variety is said to be possible if there is either a functor or categorical converter that can transform it from the space of imaginations to the space of realities in the sense that every variety possibility is made up of the variety in the imagination space with a corresponding functor from the space of functors or a categorical converter from the space of categorical convertors. Under the principle of opposites, a variety impossibility is composed of a variety without a corresponding functor from the space of functors or corresponding categorical converter from the space of categorical convertors in the space of imaginations to transform it to the space of realities.

Given the functor and categorical approach to the definition and explication of the possibility space, we may say that the presence of either functor or categorical converter generates anticipation where the corresponding spaces generate the space of anticipations which correspond to the possibility space and the space of non-anticipations corresponding to the impossibility space.

In this respect, the probability space contains expectation in addition to anticipation as generated by either a functor or a convertor in the possibility space. The improbability space is a sub-space of the space of possibility-impossibility dualities, in that, not all varieties with anticipation have expected outcomes, but some varieties in the space of anticipation and all the space of non-anticipation have no expectations. These are the differences between possibility and probability and the possibility space and the probability space. The similarity is that the possibility, impossibility, possibility-impossibility duality, the probability, improbability, probability-improbability dualities and all the corresponding spaces are contained in the space of imaginations.

**V: THE SPACE OF PRODUCTION AND REPRODUCTION OF REAL LIFE,
CONFORMAL MAPPING AND THE SPACE OF PRODUCTION AND
REPRODUCTION OF PROBLEM-SOLUTION DUALITIES**

The epistemic structure of each problem-solution duality over the space of static-dynamic dualities is a production and reproduction of problem-solution dualities over the space of parent-offspring dualities. The space of problem-solution dualities is a conformal mapping onto the space of the space of production and reproduction of real life through neuro-decision-choice actions over the space of cost-benefit dualities. The important epistemic point is that every variety problem is also a variety solution where every variety solution generates a new problem requiring a new solution. The conformal mapping shows that every cost-benefit duality is mapped onto a problem-solution duality with further mapping onto the space of production and reproduction of real life, preserving important key characteristics of genealogy and heredity that allow the present to be connected to the past in historically telescopic processes to establish conditions of the present to be connected to the telescopic future under Sankofa-anoma tradition in information continuum and

unity for the historical process in organicity. Such a conceptual system sees the meaning of life as defined by a system of problems and the essence of life is defined as the way problems are solved in never-ending problem-solution processes. Cost-benefit conditions are used to define problems, solutions and problem-solution dualities which are used to define the space of production-consumption dualities which is mapped onto the space of production and reproduction of real life with a past-present-future telescopic structure.

The epistemic field with information and relational fields containing categories and sub-categories create a framework of categorial conversions which is then related to conformal mapping which helps to preserve the essential properties over the space of identification-transformation dualities. In human neuro-decision-choice actions over the space of life-death duality, the theory of categorial conversion in addition to the theory of info-statics provide us with initial conditions and necessity for change, while the theory of philosophical consciencism in addition to the theory of info-dynamics provide us with sufficient conditions and freedom for transformation. Every variety identification presents conditions for variety transformation in either intra-categorial dynamics, intra-categorial dynamics or both over the space of incentive-disincentive dualities as established over the space of input-output dualities.

VI: THE EPISTEMIC FIELDS AND INTERNAL MULTIVATIONS

In the development of an approach to knowing and information knowledge development, it is useful to account for some important internal forces of qualitative motivation and encouragements such as courage, hope, despair, curiosity, creativity, critical thinking, critical reasoning, perseverance and other cognitive characteristics that increase motivations and efficiencies of efforts in the journeys over the space of ignorance-knowledge dualities, where the journeys are intra-categorial and inter-categorial transformations of variety ignorance to variety

knowledge through the individual and collective neuro-decision-choice actions over the space of problem-solution dualities. The theory of the epistemic fields must provide a framework to integrate these cognitive characteristics into the knowing processes and information-knowledge accumulation as neuro-decision-choice actions over the spaces of production-consumption dualities, and input-output dualities over the action space.

In these processes, all the phenomena and concepts must be defined in terms of characteristic dispositions over the relevant spaces which must be defined as collections of varieties for identifications and transformations and all-knowing varieties must be established through variety signal dispositions from variety characteristic dispositions under cognitive capacity limitations. The conceptual ideas contained in the theory of knowing as production of intellectual flows and the theory of information-knowledge accumulation as intellectual capital stocks are that the theory of knowing and the theory of the information-knowledge system are completely interdependent and integrated as foundations of general systems of variety production-consumption dualities, input-output dualities, destruction-replacement dualities over the space of variety identification-transformation dualities relative to the space of imagination-reality dualities containing the space of possible-impossible dualities, and where the space of possibility contains the space of probability-improbability dualities. The outcomes of neuro-decision-choice actions in knowing must be identified and subjected to quality control before they become available as inputs into information-knowledge processes under a paradigm of thought to be accepted into the intellectual capital stocks. It is here, that critical needs of analytical definitions and explications become necessary for category formations, categorial identities, categorial conversions, variety identities and variety transformations relative to the complex system of neuro-decision-choice actions over all spaces of human endeavors.

It is the need for analytical definitions and explications relevant for critical understanding of knowing and information-knowledge accumulation as encompassing a complete system of spaces and sub-spaces of human productions why I criticized the classical theory of knowledge and the definition of knowledge as *justified true belief* as confusing, insufficient, and unhelpful. How is *justified true belief* related to information, how is information related to knowledge that is in a *justified true belief*, how is knowledge as *justified true belief* related to data, how is data related to fact and how is fact related to evidence and evidential things and how are paradigms of thought related to the production of these concepts and ideas? Within the fuzzy paradigm of thought, these concepts are seen as fuzzy categories and the directions of their relations as obtained by fuzzy conformal mappings.

The theoretical and applied difficulties in the general understanding of knowing and information-knowing accumulation over the space of fundamental-applied dualities through the classical approach to knowledge are found in the lack of explicit definition and explication of information and the role of information as an input into the production of knowledge and the roles information and knowledge as input-output outcomes in neuro-decision-choice behavior, where is the primary category of knowing and knowledge is a derived category in the space of input-output dualities. In this respect every neuro-decision-choice is a productive activity over the space of identification-transformation dualities that contains the spaces of ignorance-knowledge and problem-solution dualities. These difficulties lead to the interchanging use of information, knowledge, fact, data, and evidence in thought without any attention to their lexical elasticities, defined by membership characteristic functions in the fuzzy epistemic space, in such a way that their interchanging uses become a menace to creative thinking, reasoning, and knowing progress over the space of imagination-reality dualities. The approach in the development of the theories of

information-knowledge processes, info-statics, info-dynamics, entropy and problem-solution dualities supported by the fuzzy paradigm of thought helps to resolve some of the theoretical and applied difficulties, where explicit definitions and explications are given to information, knowledge, fact, data and evidence as a sequential conceptual system on the basis of characteristic-signal dispositions and to show their roles in communication over the space of source-destination dualities and how they affect neuro-decision-choice actions over the space of human behavior. The phenomenon and the concept of information are not only input-output phenomena but encompass everything in similarity, commonness, differences, and distinction that must be made explicit without which human behavior will be impossible in our socio-natural environment. It is useful to note that the fuzzy paradigm of thought provides a way to deal with lexical elasticities in degrees of belonging and substitutions within synonyms and antonyms in communication under the principle of opposites.

VII. THE MONOGRAPH

The monograph is about the development of the theory epistemic fields with relational and information fields. The construct of the epistemic field starts with category formation of the space of problem-solution dualities with the use of appropriate indicator functions for knowing and information-knowledge accumulation, where there are complex intra-categorical and inter-categorical relations making explicit the understanding of give-and-take sharing modes in categorical sub-spaces of problem-solution dualities, where the resulting conditions in one category of problem-solution dualities may provide some keys to unlock the conditions of problem-solution dualities of other categories locked in relational continuum and unity. The process presents a framework to understand institutional creations with relevant departments in relation to neuro-decision-choice actions for knowing through research, teaching, and learning over the space of

socio-natural problem-solution dualities, the results of which generate experiences towards increasing information-knowledge stocks and perfection. Given the need for a segmental system of neuro-decision-choice actions over the general space of socio-natural problem-solution dualities, the monograph is set to develop a theory of epistemic fields with relational and information fields through category formation in a dynamic system of give-and-take sharing modes. The categories are used to partition the general space of socio-natural problem-solution dualities into categories of problem-solution dualities that contain problem-solution varieties with similar characteristic dispositions. The theory presents a framework for analyzing variety identities, variety relations and the role of information that provides a system of continual interactions over the space of positive-negative dualities in knowing through neuro-decision-choice actions over the identification problem-solution dualities and transformation problem-solution dualities in relational continuum and unity over the space of cost-benefit dualities.

This approach will allow us to discuss the conditions of a number of question-answer dualities regarding the role that cognitive qualitative variety characteristic dispositions play in critical thinking and reasoning relative to creativity, courage, innovation, curiosity problem-solution identifications and transformations under knowing as the production of intellectual investment flows and information-knowledge accumulation as the production of intellectual capital stocks. . These questions come to us always as primary and derived relative to neuro-decision-choice actions in all areas of human actions. We must keep in mind that the categorial partition of the space of socio-natural problem-solution dualities are a strategy and tactic to maximize the effectiveness of neuro-decision-choice actions over the general space of problem-solution dualities by simultaneously taking advantage of intra-categorial and inter-categorial results within the space of acquaintance-description dualities under a paradigm of thought.

The theory of epistemic fields with the supporting relational and information fields must be constructed to maintain the phenomena of the expansion of the space of socio-natural problem-solution dualities as well as the expansions of the relational and information fields, where these expansions have no upper bounds as old varieties exist and new varieties enter the space of varieties through the results of the natural and neuro-decision-choice actions over the space of socio-natural varieties as connected to the space of destruction-construction dualities that relate to new categories of problem-solutions dualities and natural restructuring of the ontological environment. In other words, the knowing processes and information-knowledge processes are not only interdependent but are mutually creating from neuro-decision-choice actions irrespective of the category of knowing. Every category of knowing is a category of problem-solution dualities under decision-choice actions passing through the space of imagination-reality dualities as a subspace of actual-potential dualities, where the space of imaginations contains the space of complex interactions of the spaces of possibility-impossibility dualities, probability-improbability dualities, possibility-probability dualities, possible world, impossible world, and possible-world-impossible-world dualities.

The *space of imaginations* contains the spaces of uncertainty-certainty dualities, doubt-surety dualities and decidability-undesirability dualities, visions, goals and objectives demanding courage, hope creativity and tenacity where the outcomes of neuro-decision-choice actions are nothing more than experiences, and problem-solution dualities and information-knowledge accumulation is either justified or unjustified experience that provides conditions for corrections and revisions of forces operating within opposites towards a zone of perfection under the principle of non-satiation. Alternatively, the *space of realities* contains the complex interactions of the space of problems, individual-collective dualities, cognitive characteristic dispositions, cognitive

limitations relative to courage, creativity, innovations and other such epistemic qualities in thinking, reasoning, and action. The other relevant questions relating to the need for the development of the theory of epistemic fields are stated in the preface contained in [R8.16] and how all these monographs are relationally interconnected to knowing as a production of intellectual investment flows and information-knowledge accumulation as intellectual capital accumulation to define the meaning of life and establish the essence of life within the space of problem-solution dualities.

The theory of the epistemic fields is developed to deal with: 1) the understanding of how the space of problem-solution dualities is partitioned into categories ; 2) the understanding of the relationships among intra-categorical transformations and conversions, inter-categorical transformations and conversions, and relations to the *mathematical theory of conformal mapping, category and functors*; 3) the understanding of incentive structures in categorial movements under the principles of non-satiation in the infinite search for perfection; 4) the understanding of the relations among, thinking, reasoning neuro-decision-choice actions, vision, goals, objectives, knowing, knowledge and ignorance as categorial conversions for cognitive journeys; 5) the understanding of the relevant spaces for knowing as the production of intellectual investment flows and information-knowledge accumulation as the production of intellectual capital stocks; 6) the understanding of knowing, and information-knowledge accumulation as the foundational and primary system of production-consumption dualities from which derived systems of production-consumption dualities emerge over the spaces of input-output dualities and destruction-production dualities; 7) the understanding of categorial diversities, relational continuum and unity in the space of problem-solution dualities; 8) the understanding of the establishment of foundations of categories and departments of knowing, learning, research and teaching over the space of problem-

solution dualities in the development of information-knowledge stocks; 9) the understanding of relational connectivity of information-knowledge stocks and social philosophical consciencism as guides to neuro-decision-choice actions of elements in the space of individual-collective dualities within the space of thinking-reasoning dualities; 10) the understanding of the rise of the space of systemic good-evil dualities such as racism, risk, crime, violence, injustice, justice, kindness, wickedness and many such moral varieties in the space of acceptable-unacceptable dualities of human behavior under the general principle of some codes of conduct in the social set-up that despises iniquities, lies and related baleful behaviors; and 11) how together these ten conditions provide an integrated framework for the development of institutional arrangements and their organizations over the space of problem-solution dualities.

VIII: ORGANIZATION OF THE MONOGRAPH AND THE CHAPTER SUMMARIES.

The monograph is organized with a preamble, prologue, preface, acknowledgement and nine chapters which are concluded with an epilogue. Each chapter deals with a specific set of analytical difficulties within the development of the theory of the epistemic fields with relational and information fields in support of the understanding of the development of the theory of problem-solution dualities and polarities, info-statics, info-dynamics and entropy under fuzzy information and a paradigm of thought for the general understanding of the principles of opposites, tension, conflicts, diversity and unity of knowing, science and general information-knowledge accumulation as the primary category of production-consumption dualities.

There is a *preamble to the monograph*. The preamble is composed of a series of quotations from important works by different authors in philosophy, science, mathematics, economics, decision-choice theories, and other relevant areas to the information-knowledge questions about the general science and art

of knowing under cognitive capacity limitations that generate questions over the spaces of certainty-uncertainty dualities and projected to the space of doubt-surety dualities. The preamble is used to initialize the idea that all information-knowledge systems are generated by knowing actions irrespective of the area of human endeavor through neuro-information-decision-choice processes over the space of problem-solution dualities within the ontological-epistemological duality. Again, the objective of the preamble is to introduce the reader to the conflict zones of knowing and to point out the epistemic zones of irreducible disagreements in knowing as intellectual investment and an information-knowledge system as intellectual capital accumulation enterprise.

The *prologue* is analytically structured to follow the contents of the preamble. The prologue introduces a set of essential epistemic propositions in the theoretical system on categories, the epistemic field, epistemic-field embeddings, relational fields and information fields and their relationships to categories of intellectual investment flows and information-knowledge accumulation in intellectual capital stocks. The prologue is used to set the stage of the development of the theory. Based on these essential propositions, the concepts of methodology, techniques and methods for discussing the propositions are defined, explicated and analyzed to provide conditions of their differences and commonness in theoretical and applied analytics. The techniques and methods are toolbox collections in any methodology of interest for knowing, thinking, and reasoning over the space of the problem-solution dualities. The prologue is also used to introduce the concepts of exact and inexact information structures and how they relate to the space of absoluteness and the space of relativity to affect the methodology of thinking and reasoning over the space of decidability-undecidability dualities. The prologue points to the path of the theoretical journey and the parameters of containments and deviations regarding the applicable areas over the space of question-answer dualities and polarities to establish diversity and unity principles in knowing and science.