

INFORMATION PHILOSOPHY AND ITS OVERALL BREAKTHROUGH TO PHILOSOPHY

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Information philosophy initiated in China in the mid-80s of the twentieth century is a meta-philosophy or supreme-philosophy distinguished from the other philosophy, which takes information as a generalized mode of existence, way of cognition, yardstick of valuation, principle of evolution to research on, and constructs brand-new philosophical subjects of information philosophy such as information ontology, information epistemology, information production theory, information society theory, information value theory, information methodology, and information evolution from the point of meta-philosophy. Information philosophy comes up with the theory of the co-existence and mutual-evolution of material and information, and reveals the inherent unity of the mutual conversion and fusion of time and space. In Information philosophy, the philosophical epistemology taking information as the mesomeric theory that human cognition is a type of relatively moving information construction and invented activity in multistage medium. Information philosophy has brought forth a multi-dimensionally integrative theory of human nature, which integrates nature and society, physiology, psychology and behavior, and it has meantime put forward a new dimension of information value and nature value in value philosophy. The contemporary information science as well as its thinking mode is a brand-new scientific and philosophical paradigm, which has brought about and will definitely bring about an overall and fundamental reform to the conventional science and philosophy. Information philosophy has offered an opportunity of substantial theory transformation in the course of the development of philosophy. The reason is that Information philosophy has broken the conventional dualistic contradiction pattern of material and spirit, subject and object, and accordingly changed people's perception of the world radically.

Keywords: Information; philosophy; information philosophy

My efforts of constructing information philosophy started in 1980, and I began to publish articles and books ever since 1981 as a result. The formal formation of my theory on information philosophy was marked by the publications of my article "An Outline of the Philosophical Information Theory" on the first issue of *Renwen Zazhi* in 1985, and of my book *A Guide to the Philosophical Information Theory* published by the Shaanxi People's Publishing House in June 1987. In a period of 26 years of continuous comprehensive and in-depth research, the theory of information philosophy initiated and finally constructed by me has become systemic with its full appearance as a subject. Eleven books as a series of my research on information philosophy have been published, and one hundred and seventy articles among my two hundred and twenty published articles were also dedicated to such research. My book *Information Philosophy—Theory, System, Method* published in March 2005 by the Commercial Press and my article "The Basic Theory of Information Philosophy and Its Overall Breakthrough to Philosophy" published in 2006 on the section of Social Science of the second issue of *The Academic Journal of Xi'an Jiaotong University* are considered as a comprehensive explanation to the general ideas of my theory of information philosophy.

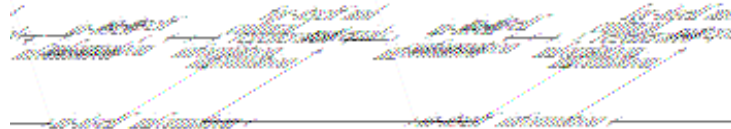
The information philosophy as a meta-philosophy or supreme-philosophy is distinguished to the other philosophy. The information philosophy takes information as a generalized mode of existence, way of cognition, yardstick of valuation, principle of evolution to research on, and generates brand-new sub-subjects of information philosophy such as information ontology, information epistemology, information production theory, information society theory, information value theory, information methodology, and information evolution from this meta-philosophy, and these sub-subjects also yield their philosophical branches. Accordingly, the second rank, the third rank or deeper ranks of subjects of information philosophy are brought about. On the other hand, information philosophy can bring about many different schools due to the different cognitions to the nature of information.

1. INNOVATION OF INFORMATION PHILOSOPHY TO PHILOSOPHICAL ONTOLOGY

In the theory of the divisional philosophical existence, the conventional philosophy holds the primary creed: existence = material + spirit. However, modern science of information and information philosophy have revealed that there is a in-itself world of information distinguished from the world of material and spirit, and the world of spirit is the highest modality of the activity of information. Therefore, the theory of the divisional existence need to be re-interpreted in this way: existence = material + Information [in-itself information + spirit (for-itself and regenerated information)].

If direct existence is used to refer to the existing mode of material world, the existing mode of information world can be accordingly referred to with indirect existence. Therefore, information can be defined as: information is a philosophical category indicating the indirect existence, and it is the existing mode of the material (direct existence) and the self-display of its state. Based on this, a new existing theory can be given: the world is the co-existential world of material and information (the direct existence and the indirect existence) (see diagram). To go with the theory about the co-existential world, the basic question of philosophy need to be transformed accordingly, which needs to illuminate the relationship not only between material and spirit, but also between material and information, information and spirit.

There is a material world and three information worlds: material world (substance and field), in-itself information world (objective information unity), for-itself and regenerated information world (subjective spiritual activity), and cultural information world (exterior appreciable storage of human regenerated information). Apparently, the four worlds interact with each other in a complex way.



2. RENOVATION TO THE OUTLOOK OF TIME AND SPACE AND THAT OF INFORMATION EVOLUTION AND HUMAN EVOLUTION

The conventional evolution theory is constructed from the evolutionary dimension of the material world. The co-existential theory of material and information will definitely lead to the emergence of the theory of the mutual-evolution of material and information.

Things interact with each other and meantime evolve, and the interaction itself fulfills a dual evolution effect: the first is the material evolution effect (The conversion and fusion of the direct existence of thing-in-itself to its another direct existence; the forming and moving of the medium; the relationship, transition, conversion and fusion of things); the second is the information's evolution effect (The direct existence of thing-in-itself transforms to its indirect existence; the construction of a new indirect existence). The evolution of material and information is the double sides of an evolution process of the universe and the things in it. In respect of the evolution of the things in the universe, the modality of information and of material evolves in a synchronized way.

The dual evolution effect fulfilled in things' interaction has made things' existence a dualization; that is, all things are a unity of direct and indirect existence, they are themselves material entity as well as information entity. Everything encodes its multiple information about its history, present and future in the process of its own evolution.

The early research about the relationship between time and space is conducted in static and separated way. Newton brought forth "absolute time" and "absolute space", which is an absolute separation of time and space. In his theory of relativity, Einstein considered the relationship of time and space as an exterior linkable unification. Whatever the principle of "relativistic asynchronism" and "effect of retrenchment and expansion of ruler" in Einstein's special relativity or the theory of "space-time curvature" in his general relativity, they are all dedicated to disclose only the relative difference of time and space in a different frame of reference and mass-energy moving system. However, the interior unification of time and space in the process of evolution was not explicitly disclosed in the theory of relativity.

The theory of information evolution disclosing the dual evolution of material and information will possibly provide us with a brand-new outlook of time-space evolution. By taking the lapse of time, structure of space and evolution of things, and the history of evolution into the consideration, the interior unification of time and space can then be revealed gradually.

Information reveals "the history in time" and "storage" in present reality, so it realizes the rest of time in space, that is, time has conversed and fused into space's pattern. The right lapsed-but-stored time in space confirms the evolution history of time's lapse and space's change. This is the right way that the direct existence of the lapsed time is stored in the later space pattern indirectly. The information of the lapsed time is meantime the information of the change of space, because the information of the lapsed time directly indicates the later-generated quality of the present space pattern.

Strictly speaking, all the theories about evolution and all types of theories of evolution are concerned about the information evolution of the interior unification of the time-space transformation. This reason is that only when the coded information of the stored history of time and space are decoded in the present space pattern, the evolution becomes perceivable and can be verified, and thus, the theory based on this can become a persuasive science.

It is believed that the evolution is fulfilled through the things' interaction. Rightly, the process of the things' interaction is the assimilating and dissimilating process of the things' information. In this assimilating and dissimilating process of information, the things in this evolution process will definitely become informationized. The things' generally informationized quality determines the multi-relationship information reflected in their interior specially constructed "stamp" in their own evolution history. As a result, the information of the past time and the old things' space pattern are more or less stored in somewhat distorted, transmogrified, partly exhausted or partly abandoned way in the present pattern. The indirect existence of history constructs its direct existence in its evolution and passes down. Therefore, the spatialized time and the temporalized space can be comprehended, which is a sure thing.

The cohered evolution information from the time-space conversion and fusion is not only referred to the past, but also to the future. The present time-space pattern itself regulates and decides how the things will evolve in the future, that is, the evolution path for the future. Admittedly, this evolution path is not totally determined, just an aggregation of possibilities. Moreover, the choice of a certain possibility relies on some other relevant conditions.

Because evolution and information have been included in the examination of the time-space pattern, the complex relation of concrete interior amalgamation of time and space can be disclosed in the respect of the pattern-constructing information. Based on the theories of interactional time-space conversion and fusion and the information cohesion in the time-space conversion and fusion, not only the complexity of the time-space interior unification which spatialized time and temporalized space could be observed, but also the time-space multilayer coil disclosed in modern fractal geometry and superstring theory, and the irregular, uneven, inconsecutive, unsmooth fractal dimension features can be more explicitly and profoundly understood.

3. INNOVATION OF INFORMATION PHILOSOPHY TO THEORY OF KNOWLEDGE

Due to the finding of the information world and the proposal of the theory of the dual existence and evolution of material and information, a brand-new theory of knowledge theory is necessary to be built accordingly, and this theory is supposed to include the following two aspects: the information-medium theory which arouses cognition, and the information-constructing and information-making-up theory of the cognitive process and mechanism.

From the point of cognition arising, the emergence of cognitive subject as determined the medium of information. This is because humans have continuously assimilated, dissimilated, stored, chosen, and self-constructed suitable information and become a special information entity in the long-lasting evolutionary course of the biological species. The human cognitive ability is considered as a special function of this special information entity. An individual's cognitive pattern is constructed with information cohering as the medium. The inherited information through "birth from the parents" is the congenital agent in constructing an individual's cognitive pattern, and the continuous assimilation of the suitable environmental information (including the cultural information created by human) is the after-birth medium in constructing an individual's cognitive pattern through "acquiring from the universe". In essence, the human cognitive activity is a process of information's activity (to distinguish, store, process and alter, create and regenerate information) taking information (in-itself information, the interaction of subject-object information, biological and psychological information congregated in a subject's cognitive pattern) as the medium.

From the point of the process and mechanism of the certain cognition arising, the information arising is the demonstration of the relation of difference; the subject's distinguishing the object's information takes reference of the subject's own characteristic to make clear the particular relation of difference. The subject and the object do not enjoy a direct contact in the course of cognition happening, while the contact is fulfilled by way of multistage medium. The object's information field, the subject's own neural and biological frame, the subject's already-constructed cognitive pattern, and the material means of the subject's cognition (tools, instruments, facilities) have built up the realistic and complex medium system of human cognition of the objects. The cognition by virtue of medium is a made-up and virtual cognition in the medium. The medium has changed, chosen and simulated the object's information when the medium's information pattern is taken reference of and the medium information has multiplied and matched the object's information. This construction and simulation is not only meant to cognitive modality, but also to cognitive content, which becomes more explicit in the cognitive activity when complex tools and facilities are used. Based on this, it is reasonable to summarize the process and mechanism of the human information cognition with three phrases: to distinguish by virtue of difference, to construct by virtue of medium, and to simulate by virtue of construction.

This brand-new interpretation of the human cognitive process and mechanism has provided a series of discussions about the subjectivity of cognitive content, relativity, uncertainty, construction, simulation, and the impossibility of simply summarizing and reverted the object's characteristic. All similar questions and the corresponding interpretation of the new cognitive mechanism has radically subverted the mechanical theory of reflection of the conventional philosophy, and brought new opportunities to the development of philosophical theory of knowledge.

The knowledge is construct in the medium, and there is a lack of direct contact between the subject and the object, so the following situations arise: if we only gather the medium information of the supposed target instead of the supposed target itself through some means, and let such medium information act on our senses, which would bring us the feelings of the real existence of the supposed target; we may also directly simulate the feelings of the supposed target's information without direct contact with the supposed target's information; we can even design some type of equipment to act on people's senses. When people's senses interact with one category of a target's information, this equipment may guide the receiver to obtain the real experience of another category of targets' information, and such equipment will then become a real-experience-like converter. This situation is a project in which the modern technology of the so-called "virtual reality" has partly realized the real that and will achieve more. To conclude this situation, the nature of virtual reality is to directly manipulate the conversion of experience by way of directly simulating the information environment, feeling and experience. Further bring about the virtual to cognition Man's, Can be predicted, the

virtual reality not the only that it cognition way man's set up be a very broad prospects, and mechanism from foundation expounded as activity information and cognition Man's.

4. NEW THOUGHTS ABOUT MAN'S ESSENCE

The philosophies of the past were broken in the discussion of man's essence—they gave broken or contradictory explanations between nature's essence and society's essence, biological essence and psychological essence or action's essence. In fact, the origin of the human and human society is a holographic cooperating evolution process of the biological inherited information pattern, psychological information activity pattern and behavioral information pattern. A man is a multi-dimensional existence's unification of nature and society, psychology, biology and behavior. Man in essence is not simply derived from or positioned in an independent one-dimension, but a product of an integrated construction of interactional multi-dimension.

Abstractly, humans are the unification of natural existence and social existence. Only social relationships make a natural man become a man in the real sense, and social relationships have to root in the human natural genetic pattern, and then become the human social relationships. The wolf-child and bear-child raised outside of human social relationships have the human natural genetic pattern, but they are not human in the real sense. Animals living with humans interact with human every day, but they lack the human natural genetic pattern, and they are still real animals. The human nature exists in the human society and then becomes humanized, and the human society exists beyond nature and it then belongs to human. In a broken state, a human's natural existence and a human's social existence is not the human any more.

Concretely, humans are the unification of biological flesh, psychological soul and behavioral activity. A human's natural existence and social existence enjoy a complex unification of a certain holographic regulation and general mapping with a human's concrete biological and psychological activity, and behavioral modality. A human's biological, psychological and behavioral characteristics are both natural and social. A man becomes a man only when he/she has the both aspects. The natural aspect is the premise that the social aspect is formed.

In a human's gene pattern, two programs regulating the individual's growing information are coded with totally different characteristics: one is determinism, which guarantees the formation of the individual's most common biological, psychological features and behavioral mode and modality, the other is indeterminism, which only regulates some possible biological, and psychological feature and the possible development of the behavioral mode and modality, and this possible development relies on the individual's existing environments. The coded deterministic program in an individual's growing gene is the fundamental and the first dimensional pattern, and the indeterminism program is the second dimensional pattern based on the first. The second dimensional pattern must rely on the first and is the evolution of the coded information in the first, but the second dimensional pattern is not only one possibility, that is, not deterministic one-choice. The construction of the second dimensional pattern is observed by the principle of bifurcating evolution, and the bifurcating evolution is determined by the individual's particular environment. To be concrete, the difference between humans and animals does not happen in the human first dimensional pattern, but in the second. For a particular construction of an individual's pattern, a human's second dimensional pattern as well as an animal's could be constructed on the base of the first. The human genetic genes code two different information programs, which respectively shape a general animal and meantime a human. If the human environment chooses the information program for an animal, the information program for a human fails to operate, and the individual then will grow to be an animal; if the environment chooses the information program for a human, the information program for an animal cannot operate, and the individual will grow to be a human. The genetic information to grow into a human or an animal depends on the as medium information. If the environment is animal, the individual will grow into one of the flock; if the individual is immersed in a human's civilized environment, he/she will grow to be one of its members.

The growing information structure coded in the individual's genes can still be subdivided into three different structure: biological, psychological and behavioral. Three of them have their own first and second dimensional structure.

Actually, the bear-child, leopard-child and the wolf-child are basically animals instead of a

human since they grow up in an environment broken away from human. Though the information program for a human does exist in their genetic genes, it fails to operate during their growing, because they have lost the medium information—the human cultural background.

The deterministic gene of the human only half guarantees the completion of a real human, and this half completion further provides the certainty for the full completion of a real human. Moreover, the other half needs the individual's efforts to complete. With society as the medium, the social aspect and the natural aspect of the human unifies in this two dimensional construe, so the natural one-dimensional construe is reformed and raised to a human's construe. This one-dimensional construe unifies with the constructed two-dimensional construe and a real human is completed. Compared to animals, human is in essence not totally determinism. As a matter of fact, the natural elements only help complete the half being a human, and the other half is left for the individual to accomplish and construct. The difference between humans and animals is ontological (the genetic base of the gene construe), and meantime super-ontological (the medium of the social and cultural environment).

The human multi-dimensional existence shows that the human essence is paradoxically determinism and indeterminism, and also open-ended. Human only grows, constructs and creates its essence in a multi-dimensional integration. Obviously, based on the multi-dimensional existence of human, a more general and complex philosophy theory about the human essence naturally comes into existence.

5. NEW DIMENSION OF NATURE'S AND INFORMATION'S VALUE OF THE RESEARCH OF VALUE PHILOSOPHY

The past value philosophy has more attention to such questions as the natural things' value in terms of human and the value of human. Along with the rise of the biological civilization of information, and the gradual recognition of the continuous development strategy, the interpretation of the human value and value philosophy should accordingly change, and a new value philosophy is necessarily established from the surface of ontological nature. Moreover, the disclosure of the information world makes our discussion about value not only within the scope of material value, but also the information value.

From the point of ontological nature, value is the effect of the thing (material, information, and the subjective form of information—spirit) brought about by the interaction of the exterior and interior elements. Based on the theory of the dual existence and dual evolution of material and information, the effect fulfilled in the interaction would be dual: the effect of material and the effect of information. It is justifiable to consider the dual effects respectively as the value of material and the value of information. The theory of the dual existence and evolution of material and information innately regulates the theory of the dual effects of the value of material and information formed in the things' interaction at the same time. This dual-effect theory has constructed the common base and foundation at the deepest level on which the theory of value of information relies.

Usually, value philosophy frequently comes to two concepts: the general existential thing and the existential thing of value. As a matter of fact, the two concepts correspond to our two different ways of looking at the world or angles of view. When we ignore the thing's innate interaction of the interior or the exterior and examine it independently from the exterior or the interior, this thing would be viewed as a general thing of existence (self-exist fact). Though this thing has its own self-identifying quality to distinguish it from the other things, this self-identifying quality cannot be revealed explicitly. The independent scrutiny ignoring the interaction cannot lead us to the essential understanding of the thing, because the interaction is the existential mode of it, and the thing without various interior and exterior interactions do not exist. When the thing is scrutinized within various interactions and relationships, it would not be general existence. Instead, it becomes the thing of relation of effect for itself and to itself in the interior interaction, or the thing of relation of effect for the other and to the other in the exterior interaction, so the thing is considered as the existence of value (fact of effect, fact of value). The universality of the thing's interior and exterior interaction can confirm the thing's universality as the fact of effect, the fact of value and the existence of value.

By condense of the relation of special effect, things then obtain the double-yardstick existential mode of value: the double yardsticks of the value of material and information. The formation of this double-yardstick existential mode of value has duplicated the thing itself: on the one hand, anything

has its particular constructing elements and constructing mode; on the other, anything is an information entity which is integrated with various particular historical relation and evolution program, and this relation and program potentially regulate its future evolution. Therefore, any process of value is meantime the process of the relevant information's exchange, transformation (dissipation and re-organization in the assimilation and dissimilation of information), and construction (condense, creation and growing).

The information value of the general interaction only operates in the plane of in-itself information activity. When the perceptive and thinking activity is involved, especially in the plane of the human activity, not only the in-itself information activity but also the for-itself and re-generating information activity—the subjective information activity takes place, which makes it necessary to involve the spiritual value into the discussion. As the spirit is the highest modality of information activity, the spiritual value is the highest modality of information value. If the dichotomy method is adopted, the material value and the information value then construct two types of fundamental value modality. Under this principle, the spiritual value as the highest modality of information value is affiliated to information value. If the thichotomy method is adopted, the material value, in-itself information value and the spiritual value are considered as three types of fundamental value modality.

The social value is not a fundamental value modality, but some kind of integration of the three mentioned fundamental value modalities in terms of the quality of its activity and the proceeding of the activity. In the social field, there are material value activity, in-itself information value activity and spiritual value activity. Moreover, the activities of the three value modalities are always innately integrated in the social field. The human social cognitive activity and social practical activity, the interaction among human, the interaction between human and the nature, the society and the nature are taking place within the three interrelated, integrated and organically unified fundamental value modalities.

Since the late twentieth century, the worldly happening information revolutionary, the economy of knowledge and information, the information society, and the waves of the socialized information, informationized society have renewed and are renewing the political, economical, military and cultural system of the human society, and further change the human way of living, thinking and world view in an overall scale. This social wave of radical reforms presents to the world a new age of human civilization—the age of information, which is distinguished from the industrial era. In the meantime, human is definitely faced with the shaking, bumping and conflicting of the value view and the value system from various aspects, and then the according revision, discarding and rebuilding of them in this radically changing age from the old human civilization to the new human civilization. In this great period of the change of civilization, the conflicting, shocking and rebuilding of the various complex interwoven ideals and realistic ideas of value, the enormous value arising from what information has given to social development and progress is promptly manifested.

The different information processing, making and spreading provide the technological premise for the human various ages of civilization. The advent of the network culture brought by the information processing, making and spreading has set the cornerstone for the technological premise for the new social civilization of information. When the new characteristics of the social civilization of information and the social development marked by the percentage of the information economy are examined, when the social evolution measured by information and the information nature of the social production are dealt with, when the change and influence of the human cognitive means brought about by the virtual reality are mentioned, when the various social functions of information are talked about, the immeasurable value of information to the social human's development and progress will have been concretely demonstrated.

6. RESEARCH COMPENDIUM OF INFORMATION SCIENCE AND SPECIAL STATUS OF INFORMATION IDEOLOGY

The rise of information philosophy is based on the modern group subjects of the systemic information science. The rise of the group subjects of the systemic information science has disclosed a brand-new existence field (the field information world) distinguished from the material world (comprising of mass and energy) on which the traditional science and philosophy have focused to explain, and provided principles for various scientific interpretations with totally new insight: the principle of

system science of holism opposite to reductionism prevalent in the traditional philosophy, the principle of information science constructed by the information's wide connection, organization, returning, program monitoring, network and holograph integration, the self-organization principle of the ordered production and increase of systemic modality's renovation, the research principle of the complex information system organically unifying the above mentioned research principles in a more integrating respect. The integrated demonstration of these principles of the various new scientific explanations fulfills the world view of the complex integration of the information system in the name of science, and changes the human scientific idea and way of scientific thinking from the substantial idea and thinking, energetic idea and thinking to the idea and thinking of information.

The idea of information takes information as a fundamental existence distinguished from material (mass and energy), and a general understanding, regulation and apprehension of its nature, way of existence, meaning and value. According to the corresponding understanding, regulation and apprehension, the way and method to master and describe the things' nature, characteristics and properties from the existing things' structural organization and mutual modality of relations, evolution program and process modality of production, the way and method of taking the existing things' structure, relationship, program and course as the carrier and sign of information and encoding the indirect existing contents of things' historical state, realistic relationship and future trend, the way and method of making sign of the target or information and granting it with special formula, they all make up of the cognitive way of information or thinking way of information—information thinking.

The various scientific research principles arising since the mid-twentieth century are innately unified. However, the innate unification fails to be adequately explored and demonstrated in the scientific research in the 20th century. Specifically, the scientific principles of holism and self-organization take the leading place in the research of the relevant fields in late 20th century, while the principle of complexity research begins to attract more attention only in the very late 20th century. Though the research principle of information science has brought about massive changes in respects of technology, economy and society, the meaning of the paradigmatic research has not been explicitly disclosed, and the value of information to things' existence and evolution has not been sufficiently comprehended and examined. In order to surpass the scientific vision of the 20th century, to change the above-mentioned situations of separating the various research principles, and complete the new integration on a higher degree, complexity research in the 21st century needs to pay adequate attention to the research of information science principle, and give corresponding importance to it. Compared to the research principles of system science and self-organization, the research principle of information science is more fundamental, more integrated and more representative of the relevant fundamental characteristics of the research principle of complexity.

The reason why the research principle of information science is more fundamental is that the development of information science has firstly disclosed a brand-new existence in respect of the ontological existence of the world, and demonstrated a brand-new world view of the dual existence and evolution of the world of material and information, and further constructed an information mesomeric of philosophical theory of knowledge.

The reason why the research principle of information science is more fundamental and more comprehensive is that the research principle of information science can better unify the research principle of the conventional reductionism, the holism and self-organization. It is known that the research principle of complexity pays more attention to the interior random, elemental independence of the system, and the characteristics of inter-dependence and comparatively independence between the system and the elements, the system and the environment, and then dialectically unifies reductionism and holism (emergentism), theory of system and information, determinism and indeterminism, the interior and exterior random, the interior and exterior returning, elements and holist relation network, mass-energy element and information. It is the fundamental theory of the research principle of information science that can reasonably represent the various fundamental features of the research principle of complexity. Apparently, the research principle of complexity as a comprehensive research principle can never unfurl to its specific contents in a reasonable and overall way if it cannot be integrated with the relevant research production of the research principle of information science representing the characteristic of the thinking way of information.

From the thinking way of information, the absolute reductionism and holism are the extremalization and mechanic research methods. In order to reasonably explain the general characteristics and features of complex things, the two's mechanize extremalization should be

removed, and reductionism and holism be organically unified. The structural theory of code cell and code cell series in information science is the concrete way and the method to organically unify reductionism and holism. It is not only the reduction of code cell, but also the reduction of relation (code cell series). If the dynamic evolution is considered, the reduction of process (information process) is necessarily included. Strictly speaking, the things' holistic un-reduction only refers to the new quality arising from the things' holistic aspect, that is, the things' holistic new quality cannot be reduced. However, from another aspect, the holistic quality of system is projected and produced in the special relation of series formed by the code cells of special quality, and the dynamic evolution of the system's holistic quality is brought about by the change of code cell and code cell series. Therefore, the general process, mechanism and method of the holistic quality can be traced back from the elements, the elements' relationship, and the scrutiny of the dynamic change to the elements and the elements' relationship, and this is why reductionism and holism do not totally conflict and contradict.

It is worth pointing out that; based on the reasonable application of the relevant theories of information science, the nanometer science technology and virtual reality technology are the models to organically unify reductionism and holism.

The nanometer science technology decodes the structural information coding in the micro-respect of nanometer, and then freely separates, chooses, pieces together, re-organizes and arranges the general things' structure in the degree of atom and molecule, and produce the needed relevant material, the scientific theory of micro-machines, and the technology of a project and application. In such a case, the particular atomic and molecular particles are the structural code cells to encode things, while the way of a particular atomic and molecular arrangement and combination is the code cell series.

With the help of the computer's relevant design, virtual reality technology uses the logic arrangement of zero and one to simulate and re-organize a great deal of information, further simulate various types of information fields, feelings, the scientific theories of the transformation of the relevant feelings, and the technology of project and application. In this case, zero and one are the code cells, and the structure of the logic arrangement of them is the code cell series.

The self-organization research principle reveals the general process and mechanism of things' ordered structure production, maintenance and increase. From the qualitative evolution process of new modality's creation and production, self-organization cannot be explained reasonably in the respect of pure material (mass and energy) activity. The system modality is not regulated by the elements such as mass or energy in a simple way. The modality in essence is a type of relation, pattern, a way to organize, and a structure of a series, and the relationship, pattern, organizing way and structure of the series can only be explained by virtue of information activity. In such cases, the mass or energy activity is only the carrier of information activity.

The self-organization of complexity system has the features of dynamic, openness, long range coherence or non-linear, inner random, the elements' independent uncertainty, and internal feedback. These fundamental features can more clearly demonstrate the general process and mechanism from the viewpoint of information activity. Concretely, the dynamic activity of the system self-organization is the result brought about by the constructing activity of the lasting and complexity re-organization of information modality. The suitable openness is the prerequisite of the relevant information of the system evolution introduced from the environment. The internal random and the elements' independent uncertainty are the internal basis of system's seeking new information modality. The interior feedback, long-range coherence or non-linearity is the general mechanism for constructing the system's organizing pattern of holistic information, the interaction network of holistic information, and the relation of the holistically holographic mapping.

Generally speaking, the creation and production and evolution of the self-organization of a particular system needs to experience the following phases of polarization, pooling, core-forming, growing, duplicating, diffusing, deviating, choosing, evolving and destroying in general. If the internal mechanism of these phases is discussed from the point of information activity, the general mechanism of self-organization can be profoundly disclosed. The general mechanism of self-organization can be revealed concretely by comparing the relevant information activities with the above-mentioned phases correspondingly: polarization—the decoupling of the interactional conjunction modality of the previous system information, pooling—the exploration of the interactional conjunction modality of new information, core-forming—the creation and production of the coded cell of information, growing—the all-pervading construction of the interactional chain of the information feedback

indicated by the information coded cell, duplicating and diffusing—the quantitative expansion of information modality, deviating—the renovation of information modality, choosing and evolving—the complicate development of information modality, the alternation of the old structure to the new—the collapse of the interactional network pattern of the holistic information of the previous system and the formation of the interactional network pattern of the holistic information of the new system.

7. SCIENCE OF INFORMATION, A BRAND NEW SCIENTIFIC AND PHILOSOPHIC PARADIGM

Information and information system like material and material system similarly bear the most common and universal quality in the respect of general meaning and scale, so the subjects taking information and the law of its movement as their primary research targets will be too many to be counted as it has happened to the subjects with material and its law of movement as their primary research targets, and moreover, these subjects will be categorized in type and degree. On the other hand, the subjects taking information and the law of its movement as their main research targets are always interacted with and never independent of the subjects with material and the law of its movement as the main research targets, because the material entity and information entity are always unified innately and concretely.

Until today, information science has grown into a large family with many members of various subjects. The concept and theory of information have become generalized, and this generalization has led to the general crossing, infiltrating and mapping of information with almost all the conventional subjects. So to speak, through such generally interactional development, the information science can expand and create its own area within any conventional subject, and moreover, its own development of the information science can meantime derive a few brand-new subjects, which are totally different with the conventional ones.

The informationized wave brought about by the contemporary science tech revolution and the economic and societal revolution of information provides a brand-new production mode, development and organization model. The meaning and value of this wave lie in its overall reconstruction and rebuilding to the human technology, economy, and societal development. To keep pace with it, the development of informationized science has made the most common and general theory and method of information science a new scientific paradigm, and this new scientific paradigm is very penetrating, lasting and renovating. When the relevant theories and methods of information science is introduced and applied to the existing conventional subjects, it will swiftly give these conventional subjects an overall change with brand-new meanings. So far, there is no certain conventional subject, which the general viewpoint, theory and method of information and information science fail to cope with.

As for the research turn in the development of philosophy, a common opinion in western philosophy circles argues that there are three stages from ontology to epistemology and then to linguistic philosophy. In my opinion, the innovation of philosophical theory is not a simple transformation in its focused area or the subject's sphere involved, but a get-rid-of-the-stale-and-bring-forth-the-fresh of the relevant viewpoints and theories in its innate fundamental area. In the philosophical research, ontology, epistemology, methodology, linguistic theory, practice theory and axiology should be seen as a unified congregation. As a matter of fact, the theoretical development of human philosophy has successfully made several changes about the focus and questioned concerned in some fields so far, but the fundamental changes do not happen to the ontological and epistemological base, which include the straight acknowledgement and specific interpretation to the binary oppositions of material and spirit, subject and object. The relevant research of information philosophy appeared in the 1980s in China and may probably bring a fundamentally revolutionary theoretical change for the first time in terms of the development of the human philosophy. This is because the discovery of the information world has provided new insights into the construction of the existential fields and the complexity of human cognition, which further deconstruct the conventional binary oppositions of material and spirit, subject and object. Information philosophy will surely bring about fundamental changes not only to ontology, epistemology, evolution, methodology, but also to linguistic philosophy, practical philosophy, the theory of human essence and existence, the theory of human production and society, value philosophy.