A Taoist Foundation of Systems Modeling and Thinking

Karl R. Lang and Jing Lydia Zhang,
Department of Information and Systems Management,
HK University of Science & Technology (HKUST), Hongkong
Tel: +852.2358.7633, Fax: +852.2358.2421
Email: {klang, zhangjin}@ust.hk

Abstract

Modern science across all disciplines is beginning to see a certain paradigm shift moving towards a new worldview, which could be called systems thinking, that emphasizes concepts like uncertainty, imprecision, dynamics, process-orientation, qualitativeness, and multi-perspective, holistic thinking. In this paper, we develop a philosophical foundation for the new systems view in science. We show that Eastern thought, especially the principles of Taoism, can contribute significantly to the motivation and understanding of systems thinking. Taking a taoist perspective, we analyze systems and systems-related approaches in various scientific disciplines, and point out several newly emerging methodologies of scientific inquiry that bear closer relationships to Eastern philosophical principles than to the traditional model of Western science. A particular focus of our paper is in the field of Information Systems, a young and interdisciplinary field that is currently characterized by a fragmentation of knowledge and multi-paradigmatism. We propose a taoist-based systems view in order to integrate the different conflicting perspectives currently employed in information systems research.

Keywords: Scientific Methodologies and Paradigms, Taoism, Systems Thinking, Information Systems,

§1 Introduction

The assumptions, which originate in Newtonian physics and Darwinian evolution (Parker et al, 1994), are now being questioned at a fundamental level by developments in the whole scope of science. The traditional scientific and technological view of nature is one of the main reasons that, during the 1980s, we have developed an increased awareness of ecological, social and technological disasters (Gore, 1992).

Accordingly what we are seeing today is a shift of paradigms not only within science, but also in the lager social arena (Capra, 1982). System thinking, a profound revolution in the history of Western scientific thought, is an arising alternative paradigm to coincide with today's problems (Skyttner, 1998). Although theories of systems thinking are heterogeneous, they are all dedicated to transcend the limits of conventional science and reveal the order underlying the complexity of nature and social life (Skyttner, 1996).

Taoism, the main Chinese trend of thought concerning on nature and universe, converges with systems thinking and its ramifications. It provides us a worldview in which the whole universe is a dynamic holistic wholeness and all things are interrelated in a ceaseless cyclic motion between two poles Yin and Yang. Recently there is increasing interest in the study of Taoism, applying its principles to many fields, such as physics (Capra, 1975), medicine, organization (Strutton et al, 1997),

computer science (Sodan, 1998). But they put much emphasis on the dualism and harmony of Yin and Yang and seldom touch the root of Taoism—Tao is the origin of all things. In this paper, however, we not only examine the interaction between Yin and Yang, which is certainly a most important part of Taoism, but also enlarge the scope by tracing to the source of Tao and its developing process. Based on profound analysis, we apply Taoism to some theories of systems thinking, and specially, to the field of IS to further develop this cross-boundary discipline and reconcile the fragmented adhocracy (Hirschheim et al, 1996).

One more point should be stated here. Taoism is often associated with mysticism. In fact this is not true. Taoism follows the same principles as Western ones in seeking a fundamental understanding of the universe and establishing theories that are verified by applying them puts it, to the world of phenomena. Thus the differences between philosophy and natural/technical sciences are not insurmountable. The dual poles of the humanities and the natural sciences, when applied seriously, are gradually converging. This fact is also evident in the current trend for natural scientists to interpret their results philosophically (Brockman, 1995), and conversely, for philosophers to create models on the basis of the results of natural sciences (Popper, 1997).

§2 Taoism

Chinese philosophy is combination of Confuism, Buddhism and Taoism, of which Taoism originated from China and stresses more about the nature and the universe. Generally speaking, Taoism is Chinese cosmology, studying the origin, stucture, and evolotion of the universe as a whole, and underlying the foundations of Chinese science and technology. For instance, classical Chinese medicine lies at the roots of Taoist central concepts like Yin/Yang and Wu Hsing, which regards human organism as a living system whose components are all interconnected and interdependent.

§2.1 Fundamental principle of Taoism

"*Tao generates One, One generates Two, Two generates Three, and Three generates all things.*"(Lao Tzu, Ch. 42)—this is the fundamental underlying principle of Taoism, as shown in Figure 1.
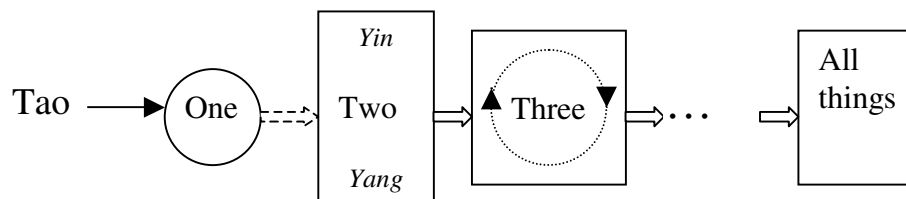
Figure 1. The process of universe generating

Tao is the origin of the universe, the entia of nihility and existence, and the ultimate indivisible and interrelated reality. It impenetrates shifts and mutations of all things; all is one. Tao is an intangible entity, which we can't see, touch, hear, smell, taste, but it does exist in eternity. The essence of Taoism is the awareness of the unity and mutual interrelation of all things and events, the experience of all phenomena in the world as manifestations of the basic oneness—Tao. "There are the three terms— 'complete', 'all-embracing', 'the whole'. These names are different, but the reality

sought in them is the same: referring to the Tao."(Chuang Tzu, Ch.22)

"*Tao generates One*" means that Tao, from empty state, generates existence, One, which represents the initially chaotic state of universe. This chaotic state converges with Chaos Theory, in which chaos is an apparently random, but deterministically driven behavior. Nihility and existence are not exclusively opposite but in mutual transformation, thus telling us artificial paradoxes might be consistent in the real sense. All things are seen as interdependent and inseparable parts of this one unity, and they are in a process of continual flow and change.

"*One generates Two*" means that any entity comprises two counteracting forecs, namely Yin and Yang, which stand for two opposite extremes, coexisting in one unity. Things have two opposite but related aspects in property and relationship.Good and bad, pleasure and pain, life and death, and so forth, are not absolute experiences belonging to different categories, but are merely two sides of the same reality, extreme parts of a single whole. All differences and contrasts are relative within an all-embracing unity. The pair of Yin and Yang is the grand leitmotiv that permeates Chinese cultures and determines all features of the traditional Chinese way of life (Needham, 1956). " Life is the blended harmony of the Yin and Yang" (Chuang Tzu, Ch. 22).

"*Two generates Three and Three generates all things*" means us that, the entire universe, both natural and social, is in a state of dynamic balance between the two archetypal poles—Yin and Yang, where Three refers to the intrinsic dynamics process of this ceaseless motion, a inevitable process to generate all things. Everything is changing through the interaction of Yin and Yang within a cyclical pattern between Yin and Yang. Nothing is static.

This generation of the universe, from Tao to all things, is a process from order to disorder. From one original state the universe exploded into miscellaneous and protean manifestations. The universe as a whole is going toward such variety. We might recall the concept of entropy and the second law of thermodynamics: all processes have invariantly proceeded in the direction of ever increasing disorder, thus entropy, the measure of disorder, is increasing.

In summary, the basic underlying principle of Taoism is the recognization of the unity and mutual interrelation of all things and events. Taoism tells us that all things and events are manifestations of a basic oneness, of which Yin and Yang are intrinsic characteristics. Everything comprises two polar and is not static but in a dynamic motion between the two opposites.

§2.2 Mechanism clarification
We can use the figure of Tai-chi T'u, or the diagram of the Tao, to give an idea of the cyclic patterns in the motion of the Tao and reach the following conclusions:

- *The recursive invariance of all things*
The circle represents basically everything in the world. It can be objects or events of any size and at any position. There is also a recursive pattern inside, which can represent things as large as the universe, as small as nucleus; not only tangible stuff, but also events and process, such as reasoning, research methodologies, and market

Figure 2 Tai-Chi T'u

operations. It is inferred that all things, no matter what size, place and attribute they have, will function following the same law in essence. Any tiny part will reflect the most important, if not all, information of the whole, just as DNA in any cell will give us perfect information of the creature. In a broader sense, all things and events are different parts and manifestations of the One, and will give us valuable information.

- *Inter-penetrating and ubiquity of Yin and Yang*

The dark Yin and bright Yang are the two intrinsic characteristics of Tao, coexisting harmoniously in any entity and exhibiting itself in any form. We can see from Figure 1 that there is Yin in Yang, and Yang in Yin, no clear boundaries between the two. The two dots in the diagram symbolize the idea that each force contains in itself already the seed of its opposite. The two round seeds coincide with the cyclic pattern of the whole, which affirms the invariance between parts and whole. Yin and Yang is a highly abstract yet most common concept that basically captures the very nature of this world, and can thus be used to describe any thing or any phenomena on this world in general.

- *The dynamic pattern of Tao*

The rotational symmetric arrangement of the dark Yin and the bright Yang, suggests a continuous cyclic movement: "The Yang returns cyclically to its beginning, the Yin attains its maximum and gives place to the Yang."(Kuei Ku Tzu, fourth century B. C.) The entire universe, both natural and social, is in a state of dynamic balance between the two archetypal poles—Yin and Yang. Whenever Yin increases, Yang will decrease, and vise versa. The direction of change is dynamic, subject to the relative strength of and interaction with each one. Whenever one extreme is about to be reached, reversal will take place. Capra (1975) use the circular motion and its projection to illustrate this characteristic:
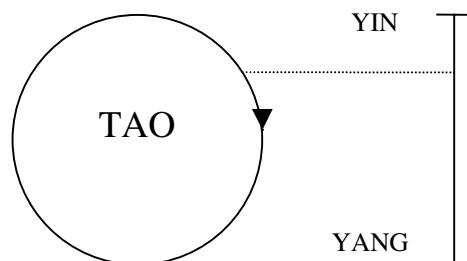
Figure 3. Dynamic Unity of Polar Opposites

§2.3 Systemic Methodology—Holistic Meditation

Holistic meditation is the experience in Taoism through which we can reach ultimate reality. The Taoists identify themselves with an indivisible systemic whole and meditate, immersing themselves in the object. Its basic characteristics lists below:

- *Follow the natural order flow*

The actions of the Taoist sage arise out of harmony with his environment, out of the balance between Yin and Yang. "*Wu-wei* does not mean doing nothing and keeping silent. Let everything be allowed to do what it naturally does, so that its nature will be satisfied."(Lao Tzu, Ch.13) We do not need to force ourselves, but merely adapt our actions to the movement of the Tao. Sustainable development, which focuses on the harmonious development of society, economics and environment, parallels Taoist thought. Development no longer belongs to economic field only, but should be regarded as a whole, from all angles and aspects, especially environment.

- *Inverse thinking*

The movements of the Tao are continuous interplays between opposites, thus whenever we want to achieve anything, we may start with its opposite.

> *"In order to contact a thing, one should surely expand it first.*
> *In order to weaken, one will surely exalt first.*
> *In order to take, one will surely give first.*
> *This is called subtle wisdom."(Lao Tzu, Ch.36)*

In classical Economics, we seek for equilibrium solutions; now non-equilibrium theories also prove a promise way to resolve problems. This is an example of using inverse thinking.

- *Beyond language*

Taoism always recognizes that the universe in its very nature transcends linguistics. Therefore, Taoism tends to emphasize the paradoxes of the universe using fuzzy concepts, leaving followers concealing them by meditation. Because verbals are unclear-cut and ambiguous, different people will get different resolutions through their own effort. The main Taoist scripture, Lao Tzu's Tao Te Ching, is written in such a seemingly illogical style, full of intriguing contradictions; and its compact, powerful, and extremely poetic language is meant to encourage the taoists' mind to get his own compprehension and throw it off its familiar tracks of logical reasoning.

- *Use qualitative and intuitive methods*

Taoism employs a number of qualitative and intuitive methods to achieve enlightenment, such as metaphors, analogies and figures. In Chuang-Tzu, large quantities of anecdotes are used to disseminate profound knowledge. Chuang Tzu once abandoned himself and melted into the outside things around him. This example illustrates that the highest success in Taoism is the state in which individuals and the environment are fused into one unity.

§3 The Parallel between Taoism and Systems Thinking

There are two basic paradigms in the Western approaches: *the Newtonian mechanic worldview* and *the systems view*. In the Newtonian mechanics, all physical phenomena are reduced to the motion of material particles, caused by their mutual attraction, i.e.

the force of gravity. Noticing the limitations of Newtonian mechanics, the systems view, emerging from modern physics, can be characterized by words like organic, holistic, and ecological. The universe is no longer seen as a machine, made up of a multitude of objects, but has to be pictured as one indivisible, dynamic whole whose parts are essentially interrelated and can be understood only as patterns of the cosmic process.

§3.1 Principles and Philosophy
The dramatic changes of thinking that happened in physics after the exploration of the atomic and subatomic world, brought about a wide discussion on paradigm shifts, which occur in discontinuous, revolutionary breaks (Kuhn, 1962). Today a shift of paradigm is seen not only within Physics, but also in the wider range of science.

The main characteristic of systems thinking emerged simultaneously in several disciplines during the first half of the century. According to the systems view, the essential properties of an organism, or living system, are properties of the whole, while none of the parts have such properties. They arise from the interactions and relationships among the parts, and may destroy when a system is dissected into isolated elements. Although we can discern individual parts in any system, these parts are not isolated, and the nature of the whole is by no means the mere sum of its parts.

Taoism in any case coincides with systems thinking in that it regards the conception of the universe as an interconnected web of relations and the cosmic web is intrinsically dynamic. Furthermore, it contributes to systems thinking the concept of Yin and Yang. Taoism stresses the wholeness instead of parts, combinations of Yin and Yang instead of Yin or Yang, and also the dynamic cyclical pattern within Yin and Yang. It provides, in some sense, an excellent philosophical background to important new theories of contemporary science, that is, an interdisciplinary science with a body of comprehensive knowledge, attempting for universal applications, to be used in collaborative research projects. It is in the nature of systems thinking and Taoism that other areas can penetrate its realm and use its methods.

§3.2 The Difference between Systematic and Systemic Methodology
Although the systems view is converging with the Taoism, there are still differences between the systematic approach, brought about by the Western tradition, and the systemic approach, i.e. Holistic meditation, rooted in Taoism, as shown in Table1.

Table 1. The comparison between systematic and systemic methodology

	Systematic	Systemic
Direction	Bottom up	Top down
Basis	Relations between parts and whole	The wholeness
Reasoning	Rational, linear, focused, analytic	Intuitive, synthesizing, holistic, nonlinear
Philosophy	Mechanistic, reductionist, or atomistic	Holistic, organismic, or ecological
Communication	Discriminate, measure, categorize and reason with mathematics symbols	Verbal conversation, meditation beyond language, anecdote, metaphor and figure
Attitude	Objective	Subjective

Generally there are three kinds of systematic approaches, the introspective systems, the extraspective systems approaches, and the constructive systems approaches (M✸ller-Merbach, 1994). All of these, whether from bottom to top or from top to bottom, from analysis to synthesis or from synthesis to analysis, all consider the relation and interaction between the whole and its components or parts, in which system analysis is crucial, implemental and inseparable.

Holistic Meditation, on the other hand, regards the things of the world as dynamic manifestations and phenomena of the ultimate indivisible oneness. Dividing them equals destroying them. For a better understanding of the things of the world, one has to become identical and mentally immersed with them, meditating about them and integrating himself with the systemic whole. It is a direct awareness of the ultimate reality without analyzing the whole in terms of its parts or components.

In systematic approaches, knowledge is acquired through the process of scientific research which can be seen to proceed in three stages—outlining the problems, searching the solutions and verifying the solutions, then this theory can be used to predict the results of further experiments. This process is well structured, thus cultivates a specific discipline "methodology" studying arrangement or method. Moreover, the two kinds of approaches are closely related to two kinds of knowledge, intuitive and the rational (Capra, 1982).

The rational and the intuitive are complementary modes of functioning of the human mind. Rational thinking is linear, focused, and analytic. It belongs to the realm of the intellect, whose function is to discriminate, measure and categorize. Thus rational knowledge tends to be fragmented. Intuitive knowledge, on the other hand, is based on a direct, nonintellectual experience of reality arising in an expanded state of awareness. It tends to be synthesized, holistic, and nonlinear. The intuitive, as featured in Holistic Meditation, can be interpreted as Yin, corresponding to responsive, consolidation, cooperative activity, while the rational, as featured in systematic approaches, as Yang, referring to aggressive, expanding, competitive activity. Yin and Yang must be balanced to achieve the most harmonious and beneficial state.

§4 Applying Taoism to Theories of Systems Thinking
Proponents of Taoism enthusiastically see signs of it everywhere, pointing to the ubiquity of dynamic unity of polar opposites, and the resemblance between patterns generated by all hierarchies and levels. In this section, we simply show the alignment of Taoism with other theories of systems thinking: that "Tao is the origin of all things", converges with the Gaia hypothesis; Taoism coincide with chaos theory in the interaction of order and chaos as Yin and Yang; holistic meditation has the same start point and logic rule as soft computing approaches.

§4.1 Taoism and Gaia
Gaia is a theory of the atmosphere and surface sediments of the planet Earth taken as a whole. The new biological worldview, and Gaia as a major part of it, embraces the circular logic of life and engineering systems. In philosophical terms this new worldview arrives the same points as Taoism.

The Gaia hypothesis is a scientific view of life on Earth that represents one aspect of a new biological worldview (Gorion, 1997). It sates that the temperature and

composition of the Earth's atmosphere are actively regulated by the sum of life on the planet—the biota, in other words, Tao. This regulation of the Earth's surface by the biota and for the biota has been in continuous existence since the earliest appearance of widespread life. Life interacts with and eventually becomes its own environment. The atmosphere is an extension of the biosphere in nearly the same sense that the human mind as an extension of DNA. Life interacts with and controls physical attributes of the Earth on a global scale—all these things resonate strongly with Taoism that all is one.

The Gaia hypothesis says, in essence, that the entire Earth functions as a massive responsive organism, which is also the fundamental principle in Taoism. We are connected not only to other people but also to other living beings on this planet's surface (Capra, 1997). Air travel, telephone lines, Internet computer hookups, waterways, and fax machines connect both people and all their life.

§4.2 Taoism and Chaos Theory

Chaos is an apparently random, but deterministically driven behavior, and chaotic theory, taking its root in the study of nonlinear dynamic systems, is the qualitative study of unstable periodic behavior in deterministic nonlinear dynamical systems (Kellert 1993). Three are three types of equilibrium: stability, when the system is directed by negative feedback, explosive instability, when the system is driven by positive feedback, and chaos, when the counteracting influence of positive feedback and negative feedback are strong and the system is sensitive to its initial conditions.

Taoism explains perfectly the three kinds of equilibria in one framework. We can look on stability, order, prediction and negative feedback as Yin, instability, randomness, noise and positive feedback as Yang. Ceteris paribus is governed by relationship and relative strength of Yin and Yang. In the first two types of equilibrium, either Yin or Yang dominates the complex system, while in the third case, Ceteris paribus, the state of the system--chaotic or stable--depends on the dynamic combination and on the relative strength of the relationships among its various elements. The force of Yang tends to reinforce the initial change and increase instability, while the force of Yin dampens the original change and tends to increase stability. The multiple interactions between Yin and Yang, or stability and instability, turn the simplest relationship we can imagine into a highly complex network of which behavior is impossible to anticipate.

Taoism can clarify properties of complex nonlinear system as well, for example, the scale invariant property: The chaotic evolution may get organized around structures that we find at different scales, called the strange attractors. Inside the attractor space, the system behavior is highly complex and unstable. However, when looking at complexity we can observe that it is also organized and that it reproduces at a smaller scale what is observed at a more global level. The scale invariance is in fact an intrinsic characteristic of Tao, according to Taoism. All things are different manifestations of the same ultimate reality and interrelated with each other, thus have the same rules or mechanisms demonstrated at different levels. A stock market is self-similar from the largest to the smallest scales, because they are the same thing in nature, as all things have the pattern of Tai-chi T'u.

§4.3 Taoism and Soft Computing
Soft computing is a path leading towards qualitative and intuitive reasoning. The essence of soft computing, unlike the traditional, hard computing, is aimed at an accommodation with the pervasive imprecision of the real world. The principal patterns at this juncture are fuzzy logic, neurocomputing, genetic computing and probabilistic computing, with the latter subsuming chaotic systems, belief networks and parts of learning theory (Zadeh, 1997).

In holistic meditation of Taoism, there is a point of fundamental importance which lies at the base that humans deal with fuzzy concepts, for instance, concepts of "middle-aged", "downtown", "partially cloudy", and "obtuse". So it uses paradox languages to convey teachings. On the other hand, soft computing use information granulation close to human intuition (Dubois et al, 1997). Information granulation states that most human concepts are fuzzy because they are the result of clumping of points or objects that are drawn together by similarity. It plays an essential role in dealing with fuzzy concepts and, in particular, with reasoning and computing in words rather than numbers.

In coming years it is likely to evolve into an important methodology to provide a way of coping with the pervasive imprecision and uncertainty of the real world. With this perspective, holistic meditation might hopefully give some hints and act as guidance to the destination.

§5 Tao in the Field of IS
Due to its roots in technology, organizational behavior, management and linguistic theory there is consensus that the field of IS is broad and encompasses many themes and areas. Yet there is far less agreement what the field actually includes or does not include and what are its core feature. In this section, we borrow the points of Taoism to shed some light on the field of IS, from the reason of existence of such an interdiscipline to the combination of soft and hard methodology in IS field to alternative resolutions of IS crisis.

§5.1 Discipline Convergence
As we have known, the typology of disciplines has undergone a process through diversity to comprehensiveness. In the age of Aristotle only a few disciplines were identifiable, namely metaphysics, Ethics, Politics, Logic and Physics. With the development of science and improvement of cognitive ability, more and more disciplines emerged; even in one discipline there are many subdisciplines. Nowadays, however, people are increasingly aware of the significance of linkage and communications across different disciplines, thus arises the field of IS, which is such an interdiscipline, capturing the core of information, system, and information systems explained in diversified styles among different disciplines. The development of IS is congruous with Taoism— all things are interconnected parts of the same unity in that all the information or information related technique are concerned with the same ultimate reality. The process of discipline comprehensiveness reflects the trend in which we look at the world in a more indivisible and interrelated way.

"All philosophy is like a tree", wrote Descartes, "The roots are metaphyiscs, the trunk is physics, and the branches are all the other science." Today the paradigm shift has overcome this Cartesian metaphor (Skyttner, 1997). Interdisciplines are arising to

resolve the complicated problems about the interconnected and indivisible reality. Isolated knowledge generated by a group of specialists in a narrow field has no value in itself. Only its synthesis with the rest of existing knowledge gives it a meaning. IS, an interdisciplinary science with a body of comprehensive knowledge, attempting for a universal application, is seen as the means to overcome the fragmentation of knowledge and the isolation of specialists.

IS discipline is by no means independent of system thinking, the common principles by which systems of all sizes operate. An information system which is in itself a system comprising parts is also part of larger scale systems. IS can borrow the thoughts of Taoism as well, and it is also in the nature of Taoism that other areas can cross its indistinct boundaries and use its methods.

§5.2 School of Thought, Hard and Soft

There are two broad tradition in the field of IS, hard approach and soft approach, versions of which underpin much IS work (Checkland et al, 1998; Hirschheim et al, 1996). The classical tradition is the "hard", functionalist approach, in which organizations, assumed to be social entities, seek to achieve goals. Management activity then contains much decision making in pursuit of goals and information systems provide support for this decision making. The "soft", or interpretive approach to information systems, employs soft system thinking and assumes that social entities seek to manage relationships. They take perspective from a humanistic stance outside the conventional positivist hypothesis-testing norm. This leads to the view that organizations are constituted as networks of conversations in which commitments are generated.

We can clearly see these two strands, soft and hard, are based upon very different assumptions, just as the two aspects of one thing, Yin and Yang. As an intellectual field, however, IS is in a fragmented state, with much of the work done within it seeming to be ad hoc rather than part of larger structures of thinking and debate. Diversity and pluralism are the order of the day (Banville et al, 1989; Swanson et al, 1993). Yin and Yang have not formed a harmonious coexistence, which will cause a number of disadvantages. A unifying research paradigm in IS field needs to be built to efficiently and effectively further the IS research, from the standpoint of Taoism which see the whole IS field is a wholeness. The framework will organize the field into interrelated sets of intellectual communities, and in so doing, acts as a vehicle for conceptualizing core research issues and identifying future research directions.

§5.3 Alternative Approach to IS Discipline Crisis

The field of IS is facing discipline crises due to the original separation between people and science and the ensuring forgetfulness (Claudio, 1998). Our current scientific approach and methodology, established by Galileo, first use geometry as substitutions of the vague shapes that exist in nature, then measure and transform the geometric forms into pure, numerical idealities (Husserl, 1970). But Galileo ignores the fact that all the imperfections and unpredictabilities are "real", while the idealizations arising from abstraction and mathematization are "ideal". Thus the transformation operated by Galileo displays a fundamental methodological distortion or inversion.

Here we are lack of the attitude that the world is interrelated and indivisible. If we arbitrarily divide the whole into parts, emphasize one and ignore another, the

conclusions we reach won't work well with the reality. Taoism tells us that, we must follow the order of nature and regard the universe as a whole. We should keep on "putting into brackets" what we believe we know about strategy, structure, markets, feedback mechanisms, stage curves, etc., and reflect upon what we observe, instead of idealize and build an ideal world of "How things should be", and try to make messy reality toward this idealized model.

Holistic meditation in Taoism sheds some light on mitigating the crisis discussed above. We should pay care to understand a system, which might be so intimately familiar with us that it disappears from the cone of our alert attention, and becomes taken-for-granted, encapsulated into the routines of our daily absorbed coping. Successful IT applications are so "immerged" with the execution of our daily tasks that they disappear and become part of the world. We need to go back to the daily, commonsensical practices, while distancing ourselves from the drawing board, the strategic desk and the geometrical models and methods.

Holistic meditation coincides with cultivation methodology raised by Dahlbom and Janlert (1997). Cultivation originally came from agriculture, focusing on the flow of nature without shaping forcefully. The term cultivation connotes a way of shaping technology that is fundamentally different from planning and constructing a technical system. While constructing is about selecting and putting together a number of objects (tools) to form a coherent socio-technical system, cultivation is about interference with and support for a material that is in itself dynamic, and possesses its own logic of growth.

§6 Conclusion
The underpinning principles of Taoism are parallel with systems thinking, which might supply us a framework to seek a new paradigm. Tao, the origin of the universe, generates all things and events, while all of them comprise two intrinsic forces, Yin and Yang. Each exhibits protean status between these two poles. The whole universe is a holistic wholeness in a dynamic motion and all things are interrelated and indivisible due to the same origin. Each individual is regarded only as a part of an organized wholeness greater than he is.

It is evident that Taoism has grains of truth despite of its old age. Furthermore, we can borrow the innumerable ideas and inferences Taoism comprises, to deal with the vague and murky contours of our life world, to solve the imperfection and unpredictability of reality, where traditional analytic science, which focuses on linear models with relatively few variables and simple causal connections, won't work well. Old thinking and old methods should be balanced by new ones taken from all human knowledge areas including music, art, philosophy and most important, Taoism. We may learn again that main paradigm shifts require a time of centuries rather than decades.

Reference
1. Brockman, J. (1995). The Third Culture, Simon and Schuster, New York.
2. Capra, F. (1975). The Tao with Physics, Shambhala, Boston.
3. Capra, F. (1982). The Turning Point, Simon and Schuster, New York.
4. Capra, F. (1997). The Web of Life, Doubleday, New York.

5. Checkland, P. and Holwell, S. (1998). Information, Systems, and Information Systems: Making sense of the field, Niley.

6. Chuang Tzu (1981, Kuo Hsiang chu). Chuang Tzu, Tai Wan Chung-hua shu chu, Tai-pei.

7. Claudio, C. U. (1998). Crisis and Foundations: an Inquiry into the Nature and limits of Models and Methods in the Information Systems Discipline. Journal of Strategic Information Systems 7, 5-16.

8. Dahlbom, B. and Janlert, L. E. (1997). Computer Future, University of Gothenburg.

9. Dubois, D., Prade, H. and Yager, R. (1997). Fuzzy Information Engineering A guided tour of Applications John Wiley & Sons, New York.

10. Gleick, J. (1987). Chaos: The Making of a New Science, Heinemann, London.

11. Gore, A. (1992). Earth in the Balance, Houghton Mifflin, New York.

12. Gorion, S. and Margulis, L. (1997). Gaia and Philosophy. In Margulis, L. and Sagan, D, Slanted Truths: Essays on Gaia, Symbiosis and Evolution, Springer-Verlag, New York, pp.145-158.

13. Hirschheim, R., Klein, H. K. and Lytinen K. (1996). Exploring the Intellectual Structures of Information Systems Development: A Social action Theoretic Analysis. Accounting, Management and Information Technology 6: 1/2, 1-64.

14. Huai Nan Tzu, Huai Nan Tzu (1981; Gao You chu). Tai Wan Chung-hua shu chu, Tai-pei.

15. Husserl, E. (1970). The Crisis of European Sciences and Transcendental Phenomenology, Northwestern University Press, Evanston.

16. Kellert, S. H. (1993). In the Wake of Chaos, University of Chicago Press, Chicago

17. Kuhn, T. S. (1962). The structure of scientific revolutions, University of Chicago Press, Chicago.

18. Kuei Ku Tzu, (1978; Chao Chuan-pi chu). Kuei-ku-tzu chu shih, Tai-pei.

19. Lao-tzu (1988; Hsu Hsiao-tien chu). Tao Te Ching Hsin hua shu tien shou tu fa hsing so fa hsing, Beijing.

20. M✳ller-Merbach, H. (1994). A system of Systems Approaches. Interface 24:4, 16-25.

21. Needham, J. (1956). Science and Civilization in China, Cambridge University Press, Cambridge Eng.

22. Parker, D. and Stacey, R. D. (1994). Chaos, Management and Economics, IEA Hobart Paper 125, Institute of Economic Affairs, London.

23. Popper, K. R. And Eccles, J. C. (1997). The Self and Its Brain—and Argument for Interactionism, Springer Verlag, Heidelberg, Berlin, London, New York.

24. Skyttner, L. (1998). The future of Systems Thinking. Systemic Practice and Action Research 11:2, 193-205.

25. Skyttner, L. (1996). General Systems Theory—Origin and Hallmarks. Cybernetics 25:6.

26. Sodan, A. C. (1998). Yin and Yang in Computer Science. Communications of the ACM 41:4.

27. Strutton, D. and Pelton, L. (1997). Scaling the Great Wall: The Yin and Yang of Resolving Business conflict in China. Business Horizon 40:5, 22-34.

28. Zadeh, L. A. (1994). Fuzzy logic, neural networks, and soft computing. Communications of the ACM Mar.