Complexity Sciences

Future Research

The 10-Year Future Scenario for Superior Education in Business

The reach of one's globalization is defined by the limit of the pronoun "WE"…

The Unicist Research Institute
Pioneers in Complexity Science Research since 1976

The 10-Year Scenario for Superior Education in Business 2018 - 2028

This future research process was developed as a consequence of the economic crisis that was triggered in 2008. The purpose of the research, led by Peter Belohlavek, was to find the human aspects that participated in the crisis and how education could have helped to anticipate it and/or accelerate the recovery.

The research included participants of 10 countries. The final objective of this research was to develop a reliable 10-year future scenario for Superior Education.

To access the basics on Unicist Future Research please enter: www.unicist.org/sdp.shtml

Superior Education is defined as the activity that deals with the acquisition of knowledge to manage the complex adaptive aspects of the environment.

The Era of the "Know Why" and Adaptiveness
From Simplicity to Complexity

Simplicity: **Professional Education**

Complexity: **Superior Education**

Level of Complexity	Approach to Lead	Field of Application
1) Rules of the Art	1) Example	1) Simple Operations
2) Techniques +1	2) Methods +1	2) Technical Operations +1
3) Technologies +2+1	3) Methodologies +2+1	3) Technical Analysis +2+1
4) Time +3+2+1	4) Tactics +3+2+1	4) Organize operation +3+2+1
5) Operative Concepts +4+3+2+1	5) Ambiguous Alternatives +4+3+2+1	5) Design operation +4+3+2+1
6) Unified Field +5+4+3+2+1	6) Strategies +5+4+3+2+1	6) Design integrated problems +5+4+3+2+1
7) Functional Concepts +6+5+4+3+2+1	7) Functional Questions +6+5+4+3+2+1	7) Design complex problems +6+5+4+3+2+1
8) Anti-Concepts +7+6+5+4+3+2+1	8) Natural Laws +7+6+5+4+3+2+1	8) Diagnose complex problems +7+6+5+4+3 +2+1
9) Essential Concepts +8+7+6+5+4+3+2+1	9) Ambiguous Questions +8+7+6+5+4+3+2+1	9) Environmental influence - Restricted and wide context +8+7+6+5+4+3+2+1

It requires having the technologies, tools and approaches to:

1. Develop reliable future forecasts
2. Design the necessary maximal and minimum strategies
3. Build the architectures that are needed to make things happen

What has changed in the environment?

1. The speed of technological development has increased
2. Information technology made most of the operational and administrative aspects of business manageable
3. Information became accessible to everyone on the Internet
4. The speed of technological evolution and the saturation of information increased the level of complexity to manage businesses

Which technologies appeared?

1. The double dialectical logic to explain the dynamics of complex problems
2. The business objects driven technologies to manage adaptive processes
3. Future research methodologies to forecast the environment that made predictive adaptive systems feasible.

What will have happened within the next 10 years?

In ten years the following aspects will probably be the standard for Superior Education:

1. Logical approaches will have replaced mechanical approaches to solve complex problems
2. Future forecasting will have become a must for business planning
3. Dynamic education will have replaced static education
4. Virtual education will be dominant
5. Educational processes will be fully learning driven
6. Complex problem solving will have replaced thematic education
7. Teachers' role will be focused on "expert counseling"

This can be synthesized in one sentence:

The "know why" and adaptiveness will be the core of Superior Education.

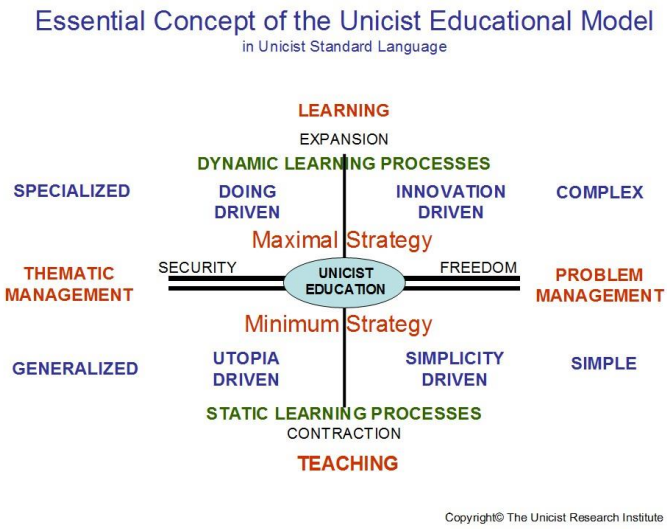
Introduction

Educational models respond naturally to the needs, archetypes and lifestyles of cultures and their development.

The changes in superior education should be guiding the changes of cultures but, unfortunately, mostly they are a consequence of the changes of cultures.

It can be noticed that the changes in education happen extremely slowly because the standards of the educational systems are implicitly established by the patterns of parents, teachers and educational authorities.

The most influential aspects of educational systems is what we have named the superior education which deals with the knowledge that goes beyond the necessary professional skills needed to work. Superior education is based on programs that are prepared to form the professional elite.



While the educational models at a superior level have been strongly driven by teaching the operational and technical aspects of a field, the IT driven tools evolved allowing automating or semi-automating the work processes which made the knowledge acquired redundant with the knowledge included in the IT solutions.

This change happened while the educational system maintained its inertia using the necessary dualistic approach to deal with operational and technical-analytical approaches.

Static vs. Dynamic Learning Processes

The superior education in business management provided an empirical operational and analytical framework for business management that upgraded professionalism in the XXth century.

The static empirical model that permitted administrating businesses provided the knowledge that allowed developing the necessary information technology that become redundant with the superior educational programs. Simultaneously, the explosive R&D capacity to release new products shortened their lifecycle.

These two situations, the redundancy of operational an analytical knowledge and the acceleration of business processes, made the static empirical approach to business become functional to business operation but dysfunctional to business management.

This scenario opened new demands for superior education in businesses that are still unsatisfied.

These new demands imply going beyond empirical approaches and providing technologies that allow managing the adaptive dynamics of businesses which require being able to forecast the future, build strategies to achieve this future and design the necessary business architecture to make the future happen.

The development of the unicist double dialectical logic and its rules provided the basic tools that allow dealing with the adaptive dynamics of businesses to build future scenarios, diagnoses, strategies and business architecture.

About Static Learning Processes

A synthetic description of static learning processes allows understanding the difference between dealing with reality as an adaptive system or managing it as a stagnated reality.

Dualistic logic and the traditional dialectical approach naturally drive towards static learning. Dualistic logic is based on the disjunction "or", which allows fixing reality with an arbitrary approach.

This allows learning operational methods and using analytical thinking to understand them. But this approach generates parallel realities when dealing with complex adaptive systems.

The final purpose is to have valid knowledge in the long term memory which is based on the operational knowledge and to have the knowledge of cause-effect relationships which provides the causal foundations of this knowledge.

The static learning process drives to sustain personal opinions which allow dealing with systemic aspects of reality where the technical-analytical knowledge is being fully managed. This knowledge is valid as long as the reality has not changed. That is why we talk about static equilibrium.

This learning process is based on what has been named "pseudo accommodation" which is based on assuming the role of an "observer" of reality and managing the projections on the environment as valid information.

It allows building hypothetical knowledge that confirms the opinions of the learner. It is the typical accumulative learning considering the external reality as an observable environment that can be influenced through cause-effect actions.

The static learning process is the natural learning standard in over-adapted environments that are driven by domination, submission and opposition of the members.

The confirmation of the knowledge is based on using fallacious confirmation processes which are based on the projection of apparent facts and hypothetical ideas to confirm the beliefs of the participants.

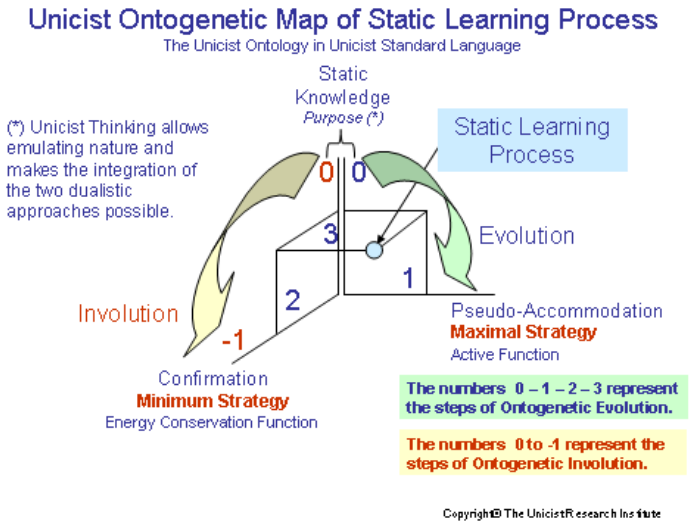
These beliefs allow confirming the opinions of the learners which are the core of the static knowledge that can be acquired in static learning processes.

1) Static Equilibrium

The use of dualistic logic, based on the confrontation of positions, using the disjunction "or" to deal with reality, drives individuals to a static equilibrium where their opinions prevail.

Dualistic thinking, following the natural behavior of neurons, is the less energy consuming thinking process.

This drives naturally towards an over-adaptive behavior which implies submitting, dominating or opposing to the environment.



Dualistic logic generates naturally aprioristic fallacies to deal with the environment which allows individuals to build a parallel reality that works as a comfort zone where they have no need of adapting. Domination, submission and oppositions are the alternatives they manage to feel safe.

Dualistic dialectics, like the ones of Hegel and Marx, provide the justification of the actions of individuals, apparently proposing a change but in fact remaining in a static equilibrium.

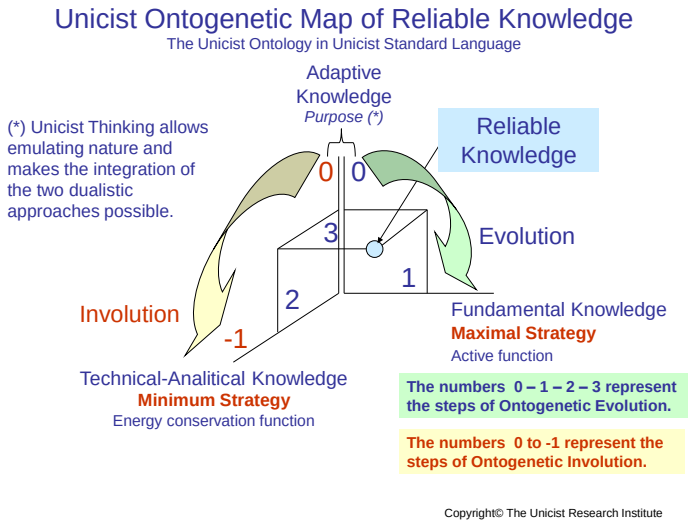
The positive aspect is that static equilibrium allows managing reality as a systemic model based on cause-effect relationships although complexity cannot be apprehended.

Static equilibrium is necessary to deal with methods and supernatural and religious thinking. That is why the basic educational system is based on teaching static processes in order to allow people to access the world of work.

Dealing with Dynamic Learning Processes

Reliable Knowledge:
The Objective of Learning Processes in Dynamic Environments

Knowledge becomes reliable when it has the necessary adaptiveness so the individual can deal with reality in a dynamic equilibrium.



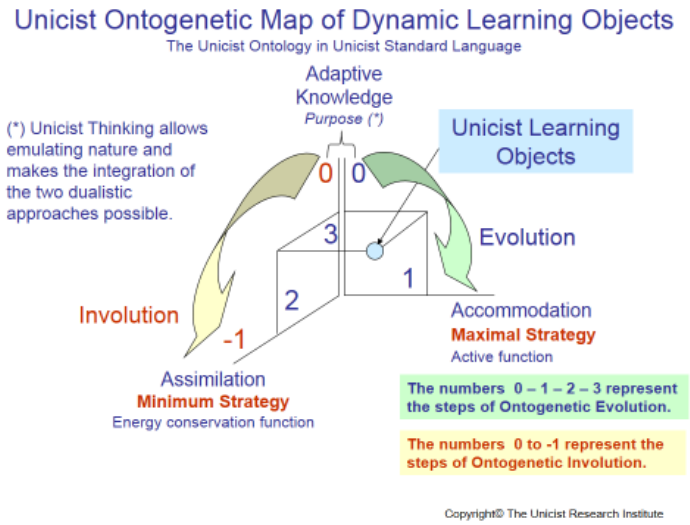
The knowledge is adaptive when it allows apprehending reality as a complex adaptive system and the individual is able to transform knowledge into actions, understanding the consequences based on its foundations.

The development of actions requires knowing the fundamentals of what someone is doing. The knowledge of the fundamentals is required to do things. Technical-analytical knowledge allows controlling the cause-effect relationships after the actions were implemented.

Reliability is based on the integration of the knowledge of the fundamentals, the technical-analytical knowledge and the possibility to adapt to the environment.

2) Dynamic Equilibrium

Dynamic equilibrium implies adapting to reality which implies a permanent accommodation process in order to generate the necessary complementation or supplementation with the environment.



Dynamic equilibrium requires using the double dialectical logic to approach reality which is based on the conjunction "and" without the existence of disjunctions. This allows individuals to influence the environment while they are being influenced by it.

See more: www.unicist.net/clipboard

It requires having a structural approach in order to be able to apprehend the fundamentals of reality and a functional approach in order to measure them in terms of results. In a dynamic equilibrium environment things are not true or false, but functional or dysfunctional.

Dynamic equilibrium requires dealing with reality as a complex adaptive system. This implies that the structure of the complex adaptive system, defined by a purpose, an active function and an energy conservation function, needs to be apprehended.

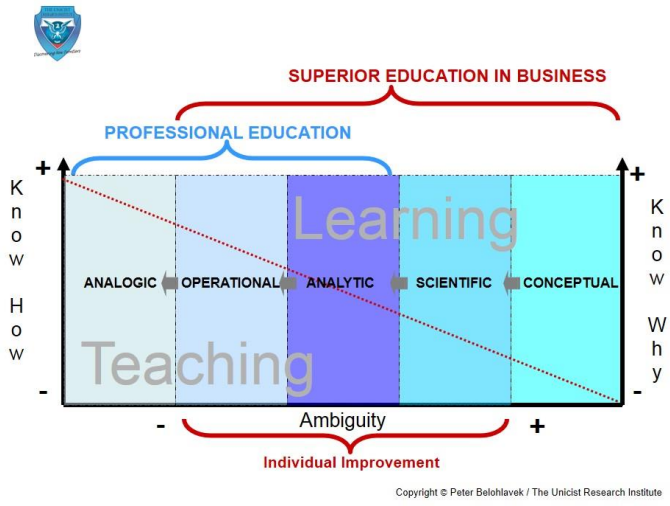
This apprehension requires the use of the double dialectical logic which demands using the unicist double dialectical thinking. This approach allows apprehending complex adaptive systems in their nature and transforming them into systemic systems making the necessary compromises without leaving aside their essential structure while measuring the results that are being achieved.

Conclusion: "Know why" and Adaptiveness are the Next Step

The unicist logical approach allows driving businesses to the next level increasing their adaptiveness and speed of actions to improve results measured in growth and profits.

This implies that the superior education has to move from the "know how" approach to the inclusion of the "know why" as a driver of learning processes.

It has to be considered that there are cultures where the question "why" is socially non-acceptable because it provides full transparency, that defines the limits of an individual's influencing capacity. In these cultures superior education is, from now on, a question of status and not of knowledge.



It also has to be considered that adaptiveness implies, besides reacting, forecasting the future and also influencing it. But in some cultures the future is a “taboo” which makes the acceptance of the credibility of reliable future scenarios impossible.

As these cultures are natural followers, their superior education cannot include aspects that deal with adaptiveness. This implies that the next step that has been defined is only applicable to cultures that accept their capacity to influence the future in an adapted way.

Anyway and anyhow this change process will demand decades and will be catalyzed by the individual initiatives of institutions and corporations that decide to make it on their own.

You can access the Unicist Education model at:
http://www.unicist.org/repo/index.php#Education

The Unicist Research Institute

Annex

About Complexity

The Unicist Logical Approach to Complexity

(a unicist ontological approach)

The unicist logical approach to complex problems

The most primitive complex problem is given by two elements that have a biunivocal relation (loop). For example:

- The lack of credibility of an innovation inhibits its use and the absence of use impedes credibility.
- The absence of production causes inappropriate distribution and dysfunctional distribution causes a lack in productivity.

Until the appearance of the solution given by the unicist approach, there were four palliatives:

- Intuition
- More or less subjective arbitrary models
- Fallacies to avoid the perception of complexity
- Ceteris paribus

Complexity is self-evident in the field of social, institutional and individual evolution. It can be said that evolution is a complex problem itself.

Complexity is implicit in the core of the business world. Those who can apprehend it and influence the environment are successful. Those who cannot influence complexity, fail. The unicist approach is necessary for those who need to manage complex problems to transform them into simple solutions, easy to be implemented.

The Unicist approach transforms complex problems into simple solutions, and these simple solutions into "easy" actions.

We define a complex system as an open system, which determines the functionality of a unified field through the conjunction of objects and/or subsystems.

A complex system has the following characteristics:

1) It is an open system, meaning that the energy flows to and from the system itself.
2) The external limits of the unified field (its globality) behave as the ones of a fuzzy set.
3) Functionality is determined by the "conjunction" of elements that influence each other, generating "loops" of cause-effect relations.
4) The "disjunction" does not exist in a complex system.
5) The sum of the results of the subsystems is not equal to the result of the total complex system.
6) Relationships among subsystems are not linear; they respond to the double dialectics laws (purpose-antithesis / purpose-homeostasis).

7) Complex systems generate their own energy transformation using their own energy and the energy from the environment.

8) Complex systems are composed of subsystems, which are also composed of other subsystems, until reaching a descriptive level that is functional to their purposes.

9) Complex systems cannot be observed. The observer is part of the system.

10) Complex adaptive systems can only be measured in their results.

"The Unicist Theory of Evolution", the "Unicist Logic" and the "Logic of Fallacies and the Anti-concepts", made the conceptual modeling and operation of complex adaptive systems possible.

Some examples of complex adaptive systems can be found in the social, economical, political and cultural aspects of reality as well as in management, marketing, strategy (of countries, institutions and individuals), learning processes, continuous improvement and interpersonal relations.

Transforming complex systems into simple systems is making them operational in a univocal way, with cause-effect relations that permit to influence the environment. This means transforming strategy, which, by definition, is a complex system, into operational tactics.

Transforming them into an easy task implies materializing these tactics through well defined actions, using a language that could be understood by all participants and the proper tools that could be used by all of them.

Nevertheless, even though we operate with simple solutions, in their essence, these problems remain complex.

The Unicist Logical Approach to Applied Complexity Sciences

The complexity of a specific aspect of reality is objective. This means that it is impossible to deal with it using cause-effect research without changing its functional nature. This indicates the existence of complexity.

The unicist approach to complexity sciences implies the discovery of the ontological structure of a reality and the objects that integrate it, defining the ontological algorithm and then the actions that can be done to influence such reality.

This approach starts with the finding of the nature of a specific element of reality and ends with the definition of the actions that can influence such reality.

The unicist ontology is a specific type of ontology that is structured emulating the ontogenetic intelligence of nature. It considers that the nature of living beings and their ac-

tions is defined by a purpose, an active principle and an energy conservation principle which are integrated following the rules of the supplementation law (between the purpose and the active principle) and the complementation law (between the purpose and the energy conservation principle).

The ontology of a functional aspect of reality is unique, being therefore timeless and cross-cultural. Its application integrates unicist ontology, with unicist logic and the unicist ontology of evolution.

Things in real life might have different functionalities. Each of these functionalities has its ontology. For example, the same type of boat can be used as a fishing boat or a survival boat. A fishing boat has “one” ontology and the survival boat has another.

Human Complex Adaptive Systems

Human individual, institutional, businesses and social behavior are also paradigmatic complex adaptive systems. The application fields of the unicist approach to complexity science are the human complex adaptive systems.

Examples of Human Complex Adaptive Systems:

Cultural Behavior and Archetypes

Cultures have to be considered as a unified field, which implies that they have a structure of taboos, utopias and myths to face the external reality in a defined way that has to be considered as a limit for any human complex adaptive system.

Economic Models

As economic models have to be redundant with the social values included in a cultural archetype, the use of non-consistent economic rules will produce paradoxical effects because it cannot be recognized as valid.

Educational Models

One of the objectives of an educational model is to socialize people’s behavior making it consistent with a cultural archetype. The introduction of alien educational models produces necessarily paradoxical results.

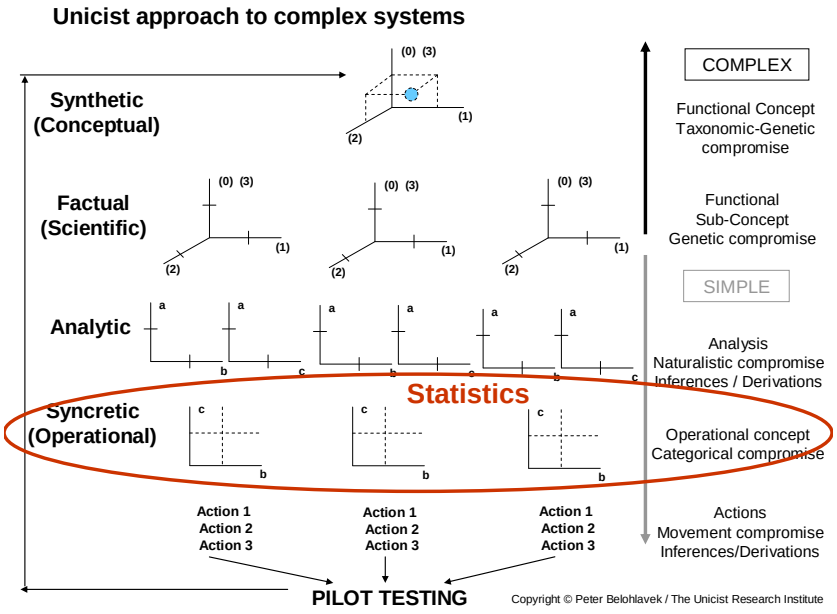
Businesses

Businesses are, by definition, complex systems that need to deal with the market, going beyond the present boundaries of the activity. Therefore they need to be defined considered as part of the unified field of the market they work with.

Conscious Personal Development

Personal evolution depends on the capacity of individuals to adapt to the environment they decided to live in. Thus it depends on the individual’s capacity to apprehend the unified field of that environment and influence it.

Necessary Compromises to Manage Complex Adaptive Systems



The generic approach:

1) Human adaptive systems are in permanent motion. To establish a fixed point based on their oneness the ontological structure needs to be discovered. This definition includes limiting the boundaries of the system.
2) A taxonomic-genetic compromise needs to be done to transform the oneness into the elements that integrate its ontogenetic structure.
3) A genetic compromise is needed to deal with the sub-ontologies or objects included in the ontogenetic structure.
4) A naturalist compromise is necessary to divide the objects of the ontogenetic structure into the double dialectical elements and make the consequent inferences on their behavior.
5) A categorical compromise needs to be done to define the ontological categories at an operational level.
6) A motion compromise has to be done to define the actions that allow influencing the adaptive system.

This approach implies transforming a human complex adaptive system into a manageable system making the necessary compromises to transform its oneness into operational actions to generate results.

The knowledge of an ontological structure of a unified field defines the existence of the possibility to exert influence on it. Mathematically, a possibility exists or not (1 or 0). The success of influential actions belongs to the field of probabilities because of the multiple compromises that have been done.

The Use of Statistics in Complex Problem Solving

Statistics are only valid if the "variables" they manage describe the ontological structure of a reality. This means that the knowledge of the ontology of a complex problem must pre-exist before statistics can be used.

From an ontological point of view statistics are necessary to enter at an operational concept level to define the sizes of the segments that might be relevant.

Comparison of the Approaches to Complexity Sciences

Aspect	**Peter Belohlavek's approach to Complexity Sciences** (*)	**Preexisting approaches: Bateson, Förster, Lorenz, Maturana, Morin, Prigogine and others**
Field of Study	Complex adaptive systems	Complex adaptive systems
Approach	Pragmatic - Structural - Functionalist	Empirical
Definition of the field of study	A specific reality as a unified field that includes the restricted and wide contexts and the emergence of the system	Based on the emergence of the system
Possibility of external observation	Inexistent	Inexistent
Research method	Unicist Ontological Research	Systemic research
Boundaries of the system	Open	Open
Self-organization	Concepts – analogous to strange attractors	Strange Attractors / undefined
Structure	Double Dialectics Dynamics Purpose - active function - energy conservation function	Variables
Relationship between the elements	Following complementation and supplementation laws	Undefined
Evolution / Involution	Based on the evolution/involution laws of the ontogenetic intelligence of nature	Undefined
Processes	Object driven processes	Undefined
Certainty	Dealing with possibilities and probabilities	Dealing with probabilities
Demonstration	Real applications	Real applications
Emulation in mind	Double dialectical thinking (using ontointelligence)	Complex thought
Emergence	Results	Results
Chaos	Inexistent	Existent
Influence on the system	Based on actions and driving, inhibiting, entropy inhibiting, catalyzing and gravitational objects.	Based on actions
Validation	Destructive and non-destructive tests (real applications)	Systemic research validation methods