Complexity Science Research

What are Complexity Sciences?

A Unicist Logical Approach based on the discovery of the Ontogenetic Intelligence of Nature

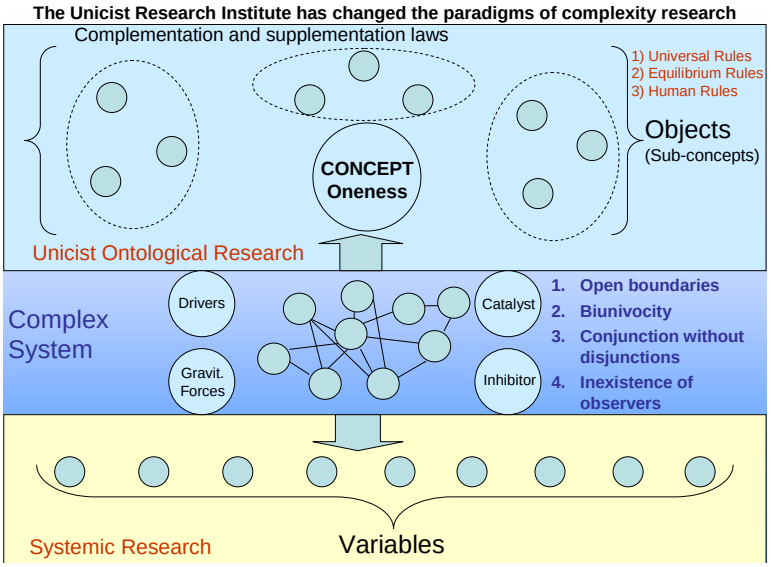
The Unicist Research Institute
Pioneers in Complexity Science Research since 1976

Preface: About the Unicist Research in Complexity Sciences

The unicist theory expanded the frontiers of sciences making the scientific approach to complex adaptive systems possible without needing to use arbitrary palliatives to transform complex systems into systemic systems in order to be able to research them.

Paradoxically, this is a breakthrough and a back to basics. On the one hand, it is a breakthrough because it changed the paradigms of scientific research. On the other hand, it is a back to basics because it drives sciences to deal with the nature of reality.

The unicist logical approach opened the possibilities of managing complexity sciences using a pragmatic, structured and functionalist approach.



The unicist approach to complexity is based on the research of the unicist ontological structure of a complex adaptive system which regulates its evolution. This is based on emulating the structure of the unicist ontogenetic intelligence of nature considering that every functional aspect of reality has a unique unicist ontological structure.

The approach to ontological structures of reality requires going beyond the dualistic thinking approach and being able to use the double dialectical logic to approach complex adaptive systems.

The research in complexity science needs to have its own format for its presentation that has a structural difference with the papers for systemic sciences (abstract, introduction, materials and methods, discussion, literature). It has to be considered that:

1) A complex system has open boundaries which implies that the experiences cannot be reproduced they can only be emulated in homologous fields.

2) Having open boundaries there is no possibility of building artificial experiences to research a complex adaptive system.

3) As it has open boundaries it cannot be observed. The observers are part of the system. This implies that a peer review can only be made based on the use of destructive tests in homologous fields.

4) The conditions of the environment change, (No one can bathe twice in the same river – Heraclitus) which means that an apparently same experience might produce different results.

5) The elements of a complex adaptive system are integrated by the conjunction "and" with multiple bi-univocal relationships. Therefore there are no univocal cause-effect relationships; this implies that the only valid measurable aspects are the results obtained.

6) Predictions of results and measurement of the achievements are the way the validity of the knowledge of the structure of a complex adaptive system is confirmed.

7) The discussions with other opinions are meaningless because complex adaptive systems have open boundaries and only its application allows confirming the knowledge obtained.

8) Multiple real applications in different homologous and analogous fields, preceded by a prediction of the results that will be obtained, need to be done to confirm the knowledge of a complex adaptive system.

9) The method of the research is in the application itself which has to correspond to the field of activity of the complex adaptive system.

10) The results are the unique measurable aspects of a complex adaptive system.

The Presentation of the Research Work

As researchers are part of any complex adaptive system that is being researched, a unicist reflection process is needed to develop the process. This implies a full involvement of the researcher in the system following an action-reflection-action process to find the unicist ontological structure that regulates the evolution of the complex adaptive system.

The presentation of the knowledge of complex adaptive systems includes two different levels of information:

a) The abstract: which includes the discoveries of the unicist ontological structures and the ontogenetic maps written in unicist standard language.

b) The research process: which describes the steps of the research process.

It becomes evident that the field of researching complex adaptive systems is for doers, who assumed the responsibility for results and have the necessary inner freedom to emulate in mind adaptive systems that are in motion.

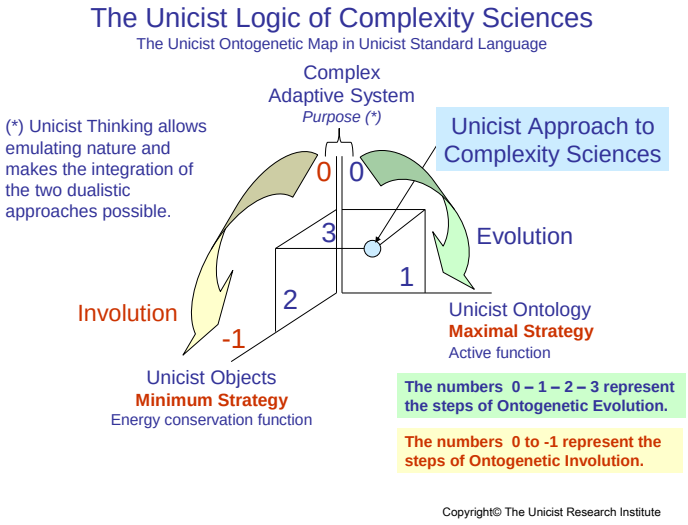
Excerpt on the Unicist Approach to Complexity Sciences

The objective of the Unicist Approach to Complexity Sciences was to find a scientific approach to understand nature and provide a structure to emulate it when designing, building or managing complex adaptive systems.

The Unicist approach developed the epistemological structure for complexity sciences with the unicist ontological methodology for complex systems research, which substituted the systemic approach to research adaptive systems and was materialized in the unicist logical approach to deal with adaptiveness.

This is an excerpt comparing the different approaches that intended to deal with Complexity Sciences. It needs to be stated that the unicist approach developed the first integrated structure to manage complex adaptive systems.

Until the existence of this approach the methods of systemic sciences were used as a palliative to deal with complex adaptive behaviors.



The structure of the unicist approach to complexity sciences implies the integration of a unicist ontological approach, which defines the structure of the nature of a specific reality with the use of unicist objects that allow emulating the organization of nature to predict the behavior of complex adaptive systems, design them, built them or manage them.

In the following pages, you will have access to a synthetic comparison of the Unicist Approach with the different approaches based on their nature and functionality:

1) Complex Adaptive Systems
2) Ontologies
3) Objects
4) Applied Research

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

Comparison of Ontologies with the Unicist Ontology

Comparison of:	Ontology (Philosophy) Aristotle, Wolff, Kant and others	Ontology (Information Science) Gruber, Sowa, Arvidsson and others	Unicist Ontology (Complexity Sciences) Peter Belohlavek (*)
Purpose	Knowledge acquisition	Information and knowledge acquisition	Managing complex adaptive systems and adaptive processes
Foundations	Discovery	Shared expert opinions	Ontogenetic Intelligence of Nature and discovery of functionalities
Use in business	To apprehend reality	Artificial Intelligence and building of complex information systems	Manage human adaptive systems and adaptive processes
Scope of application	Universal	Artificial Intelligence, Information Systems	Development of ontogenetic maps for the individual, institutional, business and social fields.
Language used	Natural	Web Ontology Language and others	Unicist Standard Language and natural language
Results to be achieved	True knowledge	Valid knowledge and information	Value generation
Evolution / Involution laws	Inexistent	Inexistent	Unicist laws of evolution
Validation model	Inexistent	Inexistent	Unicist logic
Taxonomic structure	Inexistent	Based on shared validation	Defined by the Unicist Algorithms
Mathematic validation	Inexistent	Inexistent	Following the Unicist logic
Deals with	Ideas	Categories and objects	Algorithms and business objects
Oneness	One ontology for each aspect of reality	Depending on the consensus of the expert opinions	One ontology for each functionality

Comparison of the main concepts included in the objects of nature, programming objects and unicist objects

Objects Oriented Programming Main concepts of objects in IT programming	**Complex Adaptive Systems** Main concepts of unicist objects	**Adaptive Systems in Nature** Main concepts of objects in nature (e.g. a tree)
Class	Restricted Context	Species
Object	Business Object	Entity
Inheritance	Homologous Inheritance	Inheritance
Method	Method	Functionality
Event	Action	Action
Message	Information System	Nervous System
Attributes	Fundamentals	Morphology
Abstraction	Ontogenetic Map	Genotype
Encapsulation	Unified Field	Phenotype
Polymorphism	Polymorphism	Polymorphism
-	Synchronicity	Synchronicity
-	Critical Mass	Critical Mass

Structural comparison of the applied research in the field of Human Adaptive Systems

(Individual, social & cultural behavior; institutional & business processes; future research)

Aspect	**Unicist Logical Approach**	**Alternative Approaches**
Theoretical Framework	Pragmatism, Structuralism, Functionalism	Empiricism
Starting Point	Possibilities	Needs
Goal	Produce Results	Produce Results
Attitude	Solution Building	Problem Solving
Objective	Complex Adaptive Systems Development	Complex Problems Solving
Tools	Logical Tools	Empirical Tools
Processes	Objects Driven	Variables Driven
Diagnoses	Based on Ontogenetic Maps	Based on Variables
Future Forecasts	Based on Logical Inferences & Projections	Based on Projections

Introduction

The need to build reliable future scenarios of countries and businesses, to upgrade the functionality of institutions and to foster personal talents and learning, were the main drivers to find a research methodology to approach these human adaptive systems.

Human adaptive systems are, by definition, complex. Due to the lack of knowledge of the interdependence of the elements that integrate these complex adaptive systems, the systemic scientific research could only provide probabilistic solutions. It has to be considered that complexity is an intrinsic characteristic of a system that does not depend on the evaluation of an observer.

The development of the unicist ontological research methodology allowed discovering the unicist ontogenetic maps and ontogenetic algorithms of human adaptive systems making them reasonable, understandable and predictable.

The research process is sophisticated and time consuming because adaptive systems can only be measured by results, and a hypothetical structure needs to be fully consistent with predictable results in order to be accepted as valid.

The concepts of falsification and validation, applicable to systemic sciences, were replaced by the use of destructive and non destructive pilot tests.

Complexity Sciences vs. Systemic Sciences

Complexity Sciences are defined as the scientific approach to deal with adaptive systems considering them as a unified field. The critical masses of all the interdependent elements included in the unified field of an adaptive system define its functionality. This approach is necessary when the nature of an adaptive system needs to remain unchanged. The unicist approach to complexity sciences integrates ontology, science and actions in a unified field. Therefore the research on human complex adaptive systems cannot be done through artificial experiments or simulations. It has to be done in an environment of real action. In the unicist approach doing and researching are integrated in a unified field.

The objective of applicative sciences is to study and research aspects of reality to find the foundations of their functionality in order to use the information to be able to do something.

There are aspects of reality that are complex and cannot be approached using a cause-effect systemic method, because their integrating elements have interdependent relationships and the boundaries are open.

Systemic sciences approach reality based on a dualistic cause-effect approach which is functional in all the cases where the isolation of variables is possible without generating unmanageable side-effects.

But when a complex adaptive system cannot be managed using cause-effect influences it needs to be managed in its oneness. The management of complex adaptive systems in their oneness is the field of complexity sciences.

It is self-evident that if variables cannot be isolated there is no possibility to make artificial experimentation or simulation to research the field of complex adaptive systems.

Complexity cannot be analytically apprehended. It needs to be conceptually apprehended as a unified field. The extension of the unified field needs to include all the aspects that influence significantly a complex system.

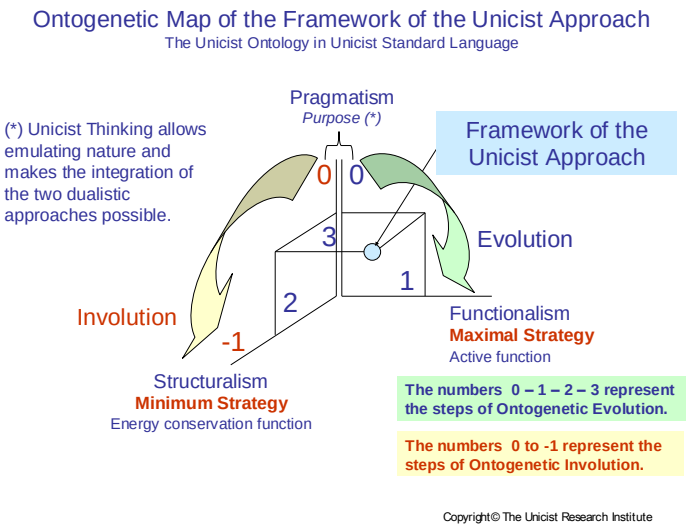
Significance requires using pilot tests to be confirmed. A reality is perceived chaotic when the amplitude of a unified field of an actual reality exceeds the possibility of a mind to apprehend it.

Only individuals who are able to work with open boundaries can deal with the open boundaries of a complex adaptive system.

It requires a high level of inner freedom which implies being willing to assume the responsibility to produce results, and being able to extend the boundaries of the mind as far as it is needed to apprehend the unified field of the system.

Scientific Framework of the Unicist Approach to Complexity Sciences

The unicist approach to complexity science was developed in order to provide a methodology that is specific to deal with complex adaptive systems in order to avoid the extension of the use of methodologies that correspond to the field of researching systemic aspects of reality.

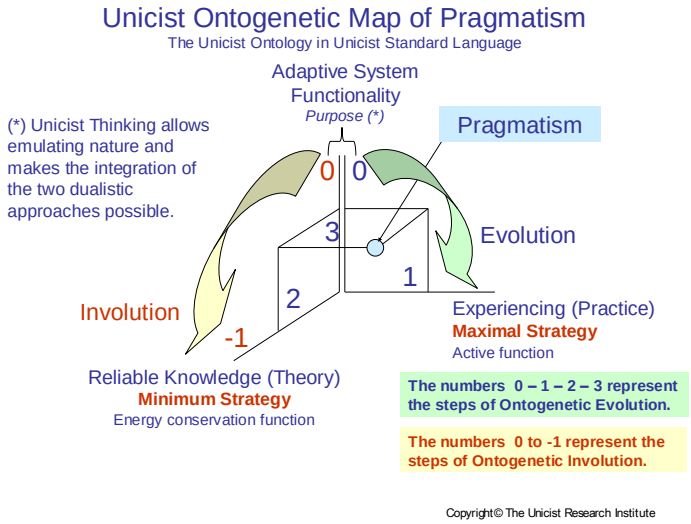


This drove towards the integration of a pragmatic, structural and functionalist approach to research in the field of complexity sciences that is the framework used in all the researches done at The Unicist Research Institute.

Pragmatism

The research in the field of complex adaptive systems does not allow artificial experiments because they change the conjunction of elements that integrate them.

Therefore a pragmatic approach that integrates practice and theory is needed. This implies that complexity science requires the integration of reliable knowledge (theory) with experiencing (practice) in order to define the functionality of a complex adaptive system.



The Unicist pragmatism is based on the integration of theory and practice based on the knowledge of the ontogenetic map of the specific aspects of reality which include their fundamentals.

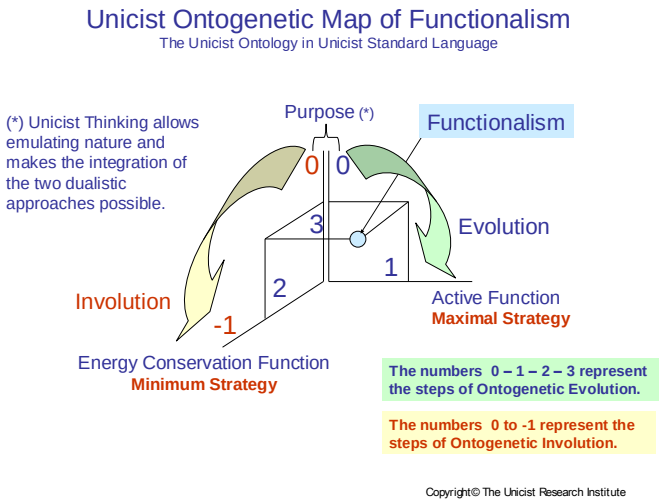
Unicist pragmatism is based on the unicist reflection process (action-reflection-action) and the use of destructive tests to establish the limits of the theoretical knowledge and non destructive tests to put pragmatism into action.

If you are not aware of the meaning of the word pragmatic, we strongly recommend researching the concept “pragmatism”.

Functionalism

Complex adaptive systems need to be approached based on the emergence they generate. A functionalist approach is needed to apprehend the functionality of the system.

Apprehending the functionality implies integrating the purpose, which is implicit in its emergences, with the active function and the energy conservation function. This allows defining the functionality of a complex adaptive system.



The conceptual structure of a given reality defines its ontogenetic map and drives its action process and evolution.

The conceptual functionalism is based on the apprehension of the conceptual structure of a given reality in order to understand its functionality and evolution. It is measured based on the consequences of actions.

Conceptual structures cannot be taught because they require being able to emulate a specific reality in mind. Therefore their apprehension can only be fostered. This requires using the unicist pragmatic approach to apprehend a concept.

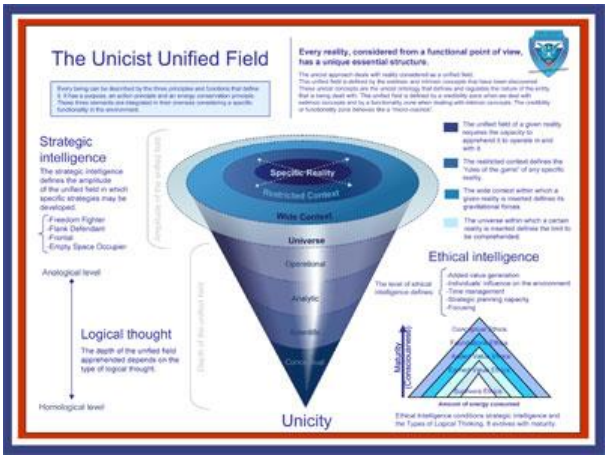
If you are not aware of the meaning of the word functionality, we strongly recommend researching the concept “functionalism”.

Structuralism

A complex adaptive system has, by definition, open boundaries. That is why it is required that the system be integrated with the restricted and wide contexts that influence it.

Therefore a structural approach is needed to integrate the system with its context and the environment to make it reasonable, understandable and predictable.

The unicist ontological structuralism is based on apprehending the unified field of a specific aspect of reality integrating its ontogenetic map with the unicist ontological structures of the restricted and wide context.



Enlarge: http://www.unicist.org/unicist_unified_field_en.pdf

The unicist ontological structure requires apprehending the drivers, inhibitors, entropy inhibitors, catalysts and gravitational aspects that are included in the unified field.

If you are not aware of the meaning of the word structural, we strongly recommend researching the concept "structuralism".

Synthesis

The unicist approach to complexity sciences is a pragmatic, structural and functionalist approach.

This approach establishes the framework for the research on complexity sciences but also for the unicist logical approach that uses the conclusion of the researches in their application in the field of complex adaptive systems.

The Unicist Approach to Complexity

(a unicist ontological approach)

The unicist approach to complex problems

The most primitive complex problem is given by two elements that have a bi-univocal 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.

Some examples of complex adaptive systems can be found in the social, economic, political and cultural aspects of reality as well as in management, marketing, strategy (of cultures, 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 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.

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 actions 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.

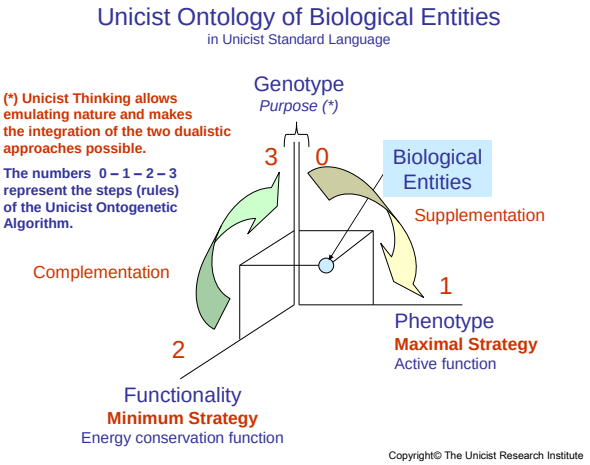
Things in real life might have different functionalities. Each of these functionalities has its ontology. For example, the same type of boat can be used as a fishing boat or a survival boat. A fishing boat has "one" ontology and the survival boat has another.

Biological Entities are a Paradigmatic Case of Complexity

The unicist ontology of a "biological entity" defines its structure and functionality in an environment.

The genotype defines the genetic structure of the entity that rules its evolution and generates the phenotype of the being. The objective of the genotype is to ensure the permanence of species, its reproduction and production.

The phenotype defines the morphologic, behavioral and materialistic characteristics of the entity. It defines the functional characteristics, the functional power of the entity and the functional assurance.



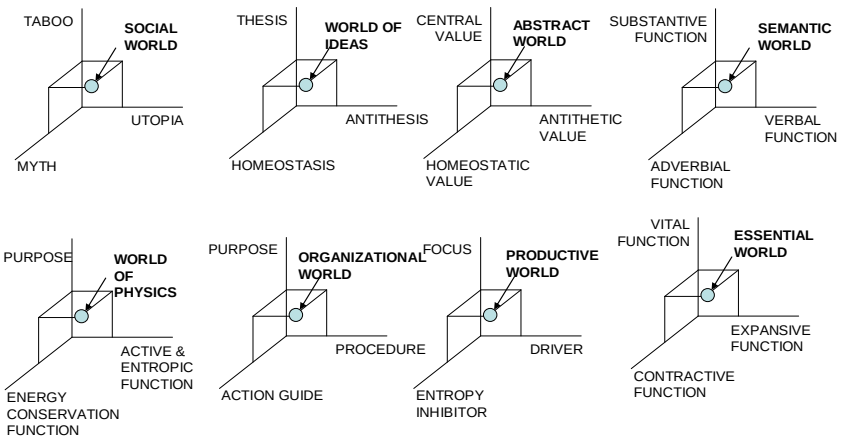
Functionality defines the effectiveness of the phenotype measured as the consequence of the adaptation of the biological entity to the environment. Functionality is measured in the capacity to adapt and grow, on the one hand, and to survive, on the other hand.

The understanding of the ontology of "biological entities" helps to follow the laws of nature when dealing with genetic engineering processes and use it to apprehend the nature of beings with "artificial life" such as institutions.

Researching and Designing Adaptive Systems is an Adaptive Process

The research and design of complex adaptive systems requires adapting to the different application fields.

Unicist double dialectics semantics



Therefore the semantics of the ontological structure has been defined using different wording for the homologous ontogenetic structure.

Logical approaches have been developed to solve specific problems. Researching and designing human complex adaptive systems implies the use of a new logic.

The unicist logic has been developed to deal with complexity and integrates preexisting logical approaches in their oneness.

The learning of the reading of unicist ontologies and the unicist logic is strongly recommended when entering the field of researching human complex adaptive systems.

Human Complex Adaptive Systems

Human individual, institutional, businesses and social behaviors 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 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

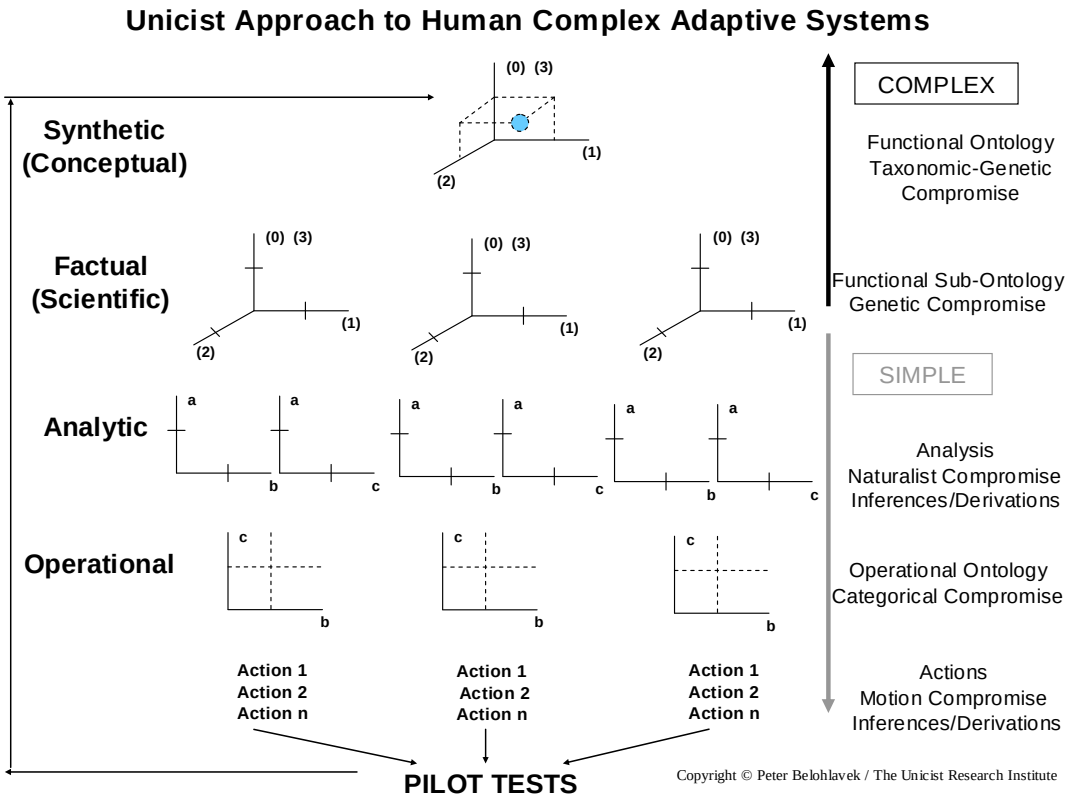
Businesses are, by definition, complex systems that need to deal with the market, going beyond the present boundaries of the activity. Therefore they need to be defined considered as part of the unified field of the market they work with.

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

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 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.

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.

Mechanisms to Avoid Dealing with Complexity

People who cannot apprehend the unified field of a human complex adaptive system need to have substitutes to deal with it.

Some of them are:

1) Statistics
2) Ceteris Paribus
3) Intuition
4) Consensus of expert opinions
5) Analysis

    1) Statistics substitutes the approach to possibilities with probabilities. This allows eliminating the perception of chaos produced by the unknown unified field and dealing with the system as if it were not complex.
    2) Ceteris Paribus allows stagnating a variable and thus eliminating the complexity of a complex system.
    3) Intuition is the natural approach to an unknown field. But complexity cannot be perceived when intuition is not followed by conscious knowledge.
    4) Consensus of expert opinions is a natural substitute when dealing with complexity. It allows believing that the integration of different points of view provides objective knowledge of complex systems.
    5) An analytical approach to complex systems implies dividing them into components that are considered as non complex or have a smaller "unified field" making them apprehensible. This is a fallacious approach because a complex system is not the sum of its parts.

It is necessary to use substitutes until the ontological structures of complex systems are discovered. This can be done as a solution or as a provisional solution. It is up to every individual who is responsible for producing results in the field of human complex adaptive systems.

Complexity Science Methodology to Research the Ontology of Human Adaptive Systems

There is a general research methodology that has to be followed to define the validity of an ontological structure that is needed to deal with human adaptive system.

The basic steps are:

1) Develop the hypothetical structure of the ontology.
2) Analyze the ontology and divide it into sub-ontologies following the laws of complementation and supplementation (only when necessary and possible).
3) Define observable results that need to be considered to validate the ontology.
4) Define the application fields of the ontology to validate its functionality.
5) Develop the applications beginning with destructive and non-destructive pilot tests to forecast reality.
6) Develop at least five experiences in the application field differing completely one from the other.
7) Develop forecasts of at least three periods with full certainty.
8) Restart the research process every time a deviation occurs.

Pilot Testing

Ontologies are omnipotent fantasies unless they have been tested. The testing of ontologies implies testing their functionality and requires a precise design of the tests.

The "trial and error" use of objects is not a pilot test.

Pilot tests are the drivers of the unicist reflection processes. Pilot tests have two objectives:

1) Falsification of knowledge
2) Validation of knowledge

1) Falsification – Destructive Testing

Falsification, in the field of complex problems, implies finding the limits of the validity of a given knowledge. To do so, it is necessary to develop experiences in homologous fields until the limits of validity are found. It defines the unified field that can be apprehended.

The falsification process is a destructive test for knowledge that is applied to realities with incomplete homologies. The destruction occurs when a condition is found to demonstrate the fallacy of the knowledge.

2) Validation – Non-destructive Testing

Validation implies the factual confirmation of the validity of knowledge. Validation is achieved when knowledge suffices to exert influence on a reality in a predictable way.

The validation process is homologous to a non-destructive test in the field of material research. Validation implies cause-effect relations. Therefore, validation can only be applied to a simplified field of a complex reality.

Complex Problem Solving

using Ontological and Statistical knowledge

Ontological knowledge describes the nature of an object. The ontological knowledge is a description of the essential functionality of an object. Destructive and non-destructive tests are needed in order to accept its reliability.

Its validity can only be demonstrated based on the accuracy of its predictions.

The management of the skills to solve complexity requires a total involvement in the solution of real complex problems with which the learner is totally committed and ends up in real actions beginning with pilot testing.

There are specific mental processes necessary to deal with:

1) Open boundaries
2) Bi-univocal cause-effect relations
3) Conjunctions and the inexistence of disjunctions

Open boundaries imply that there can be no observers. When dealing with complexity, the "observer" is part of the system. The conjunction of its components implies that the inexistence of one of the elements involved destroys the complex system. It works as a "0" in a multiplication.

Human approach to complex problems is based on the individual's ontointelligence in which:

a) Ethical Intelligence defines the capacity of an individual to focus on a problem. Such focus sustains the individual's introjection-process of the problem.
b) The predominant type of thinking an individual has defines the depth of the comprehension of the problem, beginning with the operational aspects and ending with the comprehension of its essential concept.
c) Strategic intelligence defines the amplitude of the problem an individual can solve.
d) Unicist thinking allows the individual to apprehend and comprehend the dynamics of the problem and therefore it permits the comprehension of its complexity within the limits established by his type of thinking and his strategic intelligence.

Emotional aspects and functional intelligence need to be managed before accessing complexity.

The development of new skills requires the use of the corresponding neural networks in the brain. Only real actions develop new neural networks.

Statistical Approach to Reality

Let us consider an example of a presentation:

Hans Rosling: Debunking third-world myths with the best stats you've ever seen:

http://www.ted.com/index.php/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html

Reading Hans Rosling's profile it is very clear that the statistics are biased by his beliefs:

"As a doctor and researcher, Hans Rosling identified a new paralytic disease induced by hunger in rural Africa. Now the global health professor is looking at the bigger picture, increasing our understanding of social and economic development with the remarkable trend-revealing software he created."

After you have seen it you will be able to perceive that:

a) There is no relation between size of families and length of life.

b) Mao brought food to China; health was one of the consequences. Mao deproletarized China.

c) South Korea is a small/mid size emerging country and Brazil is a huge emerging country with a historical disparity in social evolution as a starting point. They cannot be compared because their archetypes and starting point are extremely different.

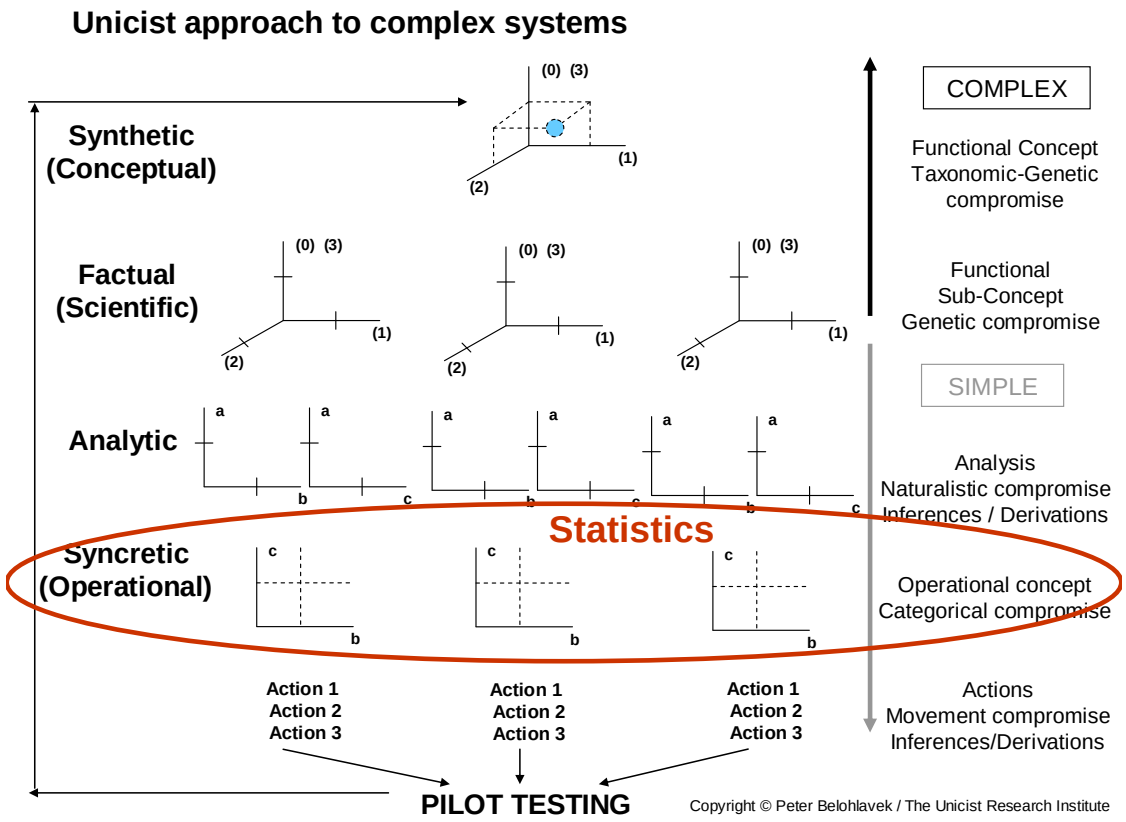
See also: The Top Five Most Annoying Statistical Fallacies
http://debunkingdenialism.com/2011/11/17/the-top-five-most-annoying-statistical-fallacies/

The Use of Statistics in Complex Problem Solving

Statistics are only valid if the "variables" they manage describe the unicist ontological structure of a reality.

This means that the knowledge of the unicist ontology of a complex problem must preexist before statistics can be used.

From an unicist 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.



Unicist Ontological Research (*)

In order to do research on concepts one must have a conscious experience in the field under study. It is only with this experience that hypotheses can be developed.

When working in homologous fields one has the advantage of being able to transport the functional conceptual structures from one field to another. Research is carried out using the same methodology, but the experience in the homologous field allows one to establish the first hypothesis.

Operational concepts, which behave as pre-concepts, are the scientific grounds supporting the research of functional concepts. Functional concepts are divided into as many sub-concepts as needed to validate their structure.

An adequate research will allow the transformation of a complex system into a simple system through the knowledge of its concept and sub-concepts.

(*) Excerpt from the R&D e-book "Design of Complex Systems Research"

Conclusions

Without having the unicist ontology of a given complex reality the validity of statistical knowledge is hazardous. When boundaries are open and there are bi-univocal relations, statistical approaches are a way to dimension the unicist ontological structure discovered or just a palliative to have hypothetical ideas of what is happening.

Stochastic simulation, correlation, regression and multivariate analysis are statistical palliatives to approach reality in unknown fields. They can also be used to find the first hypothesis when researching the unicist ontological structure of a reality.

Life sciences, social/economic sciences and businesses are typical complex problems where the misuse of statistics produces paradoxical results.

But without statistical tools it is not possible to dimension the problems in order to implement solutions.

The research developed in the field of human complex adaptive systems allowed developing since 1976 more than 5,000 ontological structures that cover the field of individual, institutional, business and social behavior.

The Unicist Ontology of Complex Systems

The Unicist Ontology of Complex Systems was developed based on the experiences and applications in medicine, human behavior, social behavior, businesses and future research. The apprehension of complex systems requires a significant abstraction and integration effort in order to be able to emulate these systems in mind.

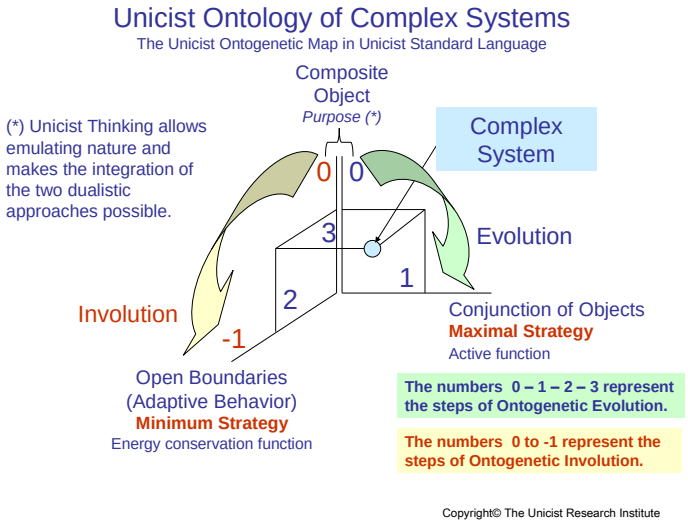
This unicist ontology provides an answer that ends the open discussion of what complex systems are. It allowed defining the functionality of complex systems and how to influence such systems and build them.

A Complex system is an entity that works as a composite unicist object, integrated by a conjunction of objects, that has open boundaries with the environment.

All complex systems are organized by objects, which allow managing complexity. This is self-evident in a human body where each organ is an interdependent object to sustain the life of the human being. Another example in social life can help to clarify this characteristic of the complex systems: the roles people assume work as objects in society.

At an operational level, the core characteristics of a complex system are:

1) All the elements of the complex system are integrated by conjunctions without the possibility of the existence of disjunctions.
2) The openness of the boundaries of the objects that integrate the complex system and the openness of the system as an object itself.



A unicist object is defined as an adaptive system that has a concept to fulfill, has a value adding function and a quality assurance process to sustain the purpose of the system. The concept is defined by having a purpose, an active function to put the purpose in action and an energy conservation function to sustain the achievement of the purpose.

The complexity of a system is intrinsic, which means that it does not depend on the perception of an individual. But in order to apprehend a complex system it is necessary that the person emulates the system in mind, which fully depends on the individual.

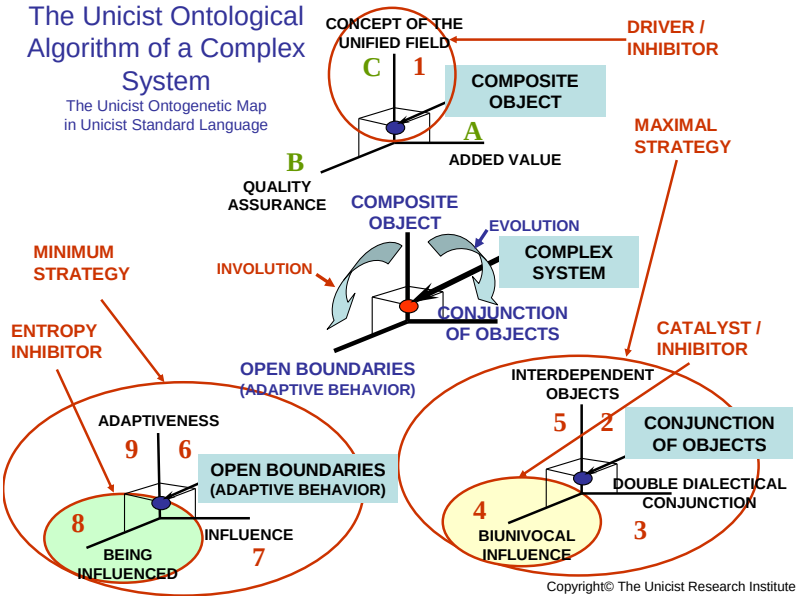
This requires that the individual needs to be able to go beyond a dualistic thinking process in order to be able to apprehend the conjunctions implicit in the system and needs to have the concept of the environment in order to be able to deal with the open boundaries of the system.

There are fields that are generally accepted as being complex such as: Life-sciences, social sciences, anthropology, political sciences, economic sciences, behavioral sciences, medicine, psychology, education, businesses, ecology, meteorology.

The Ontological Algorithm of a Complex System

The driver of a complex system is the concept that regulates its unified field to generate results. This driver is what generates the emergence (results) of the complex system.

The system needs to add value in order to influence the environment to sustain the openness of its boundaries. The fulfillment of the purpose of the concept is sustained by a quality assurance process that needs to manage the influence of the environment.



The maximal strategy is based on managing the conjunction of the objects that integrate the complex system. It requires identifying the objects that integrate the system and how they are integrated.

The integration of the objects is given by their conjunction including them following the rules of the double dialectical logic. This logic defines that each object is integrated with another object assuming a complementary or supplementary role and their integration builds an object of superior order of complexity.

Since these interdependent objects that have biunivocal relationships are integrated, it is necessary to apprehend them as a unified field using the unicist logic, which emulates the ontogenetic intelligence of nature.

The functionality of the biunivocal influence works as the catalyst of the functionality of the complex system.

The minimum strategy that sustains the functionality of the complex system is built upon the management of the open boundaries based on the adaptive behavior of its elements. Such adaptive behavior implies that adaptiveness is sustained by the influence that is exerted by the system while the influence that is exerted by the environment on the system is managed.

The influence exerted on the environment is based on the complementation of the complex system with the environment. This complementation requires covering two different aspects:

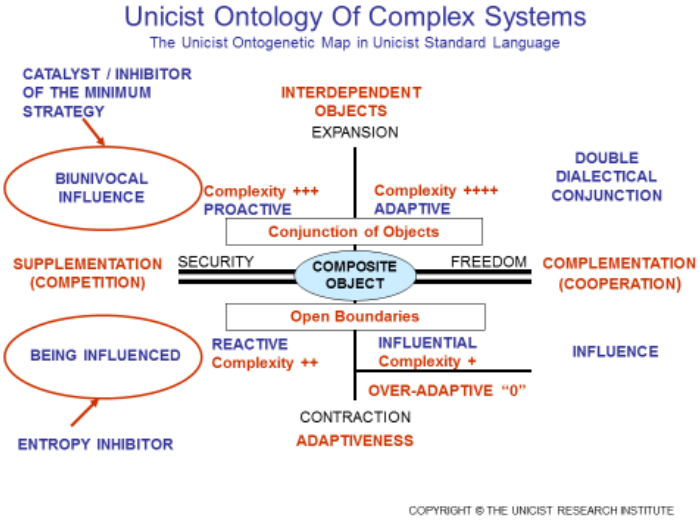
1) An asymmetric complementation with negative slope in order to have an influential role.
2) A symmetric complementation to establish a participative relationship with the environment.

The influence exerted by the environment is based on a competitive relationship, which implies the existence of supplementary roles between the system and the environment. This requires paying the prices of sustaining the objective of the system within the boundaries established by the influence of the environment.

Adaptiveness is the final goal of the minimum strategy and requires managing the biunivocal influence between the system and the environment.

Levels of Complexity Management

The complexity of a system is defined intrinsically by the characteristics of the system. The more objects that integrate a complex system, the higher the level of complexity of such system.



Five levels of complex systems have been defined:

1) Level of Complexity 0 – Over-adaptive Complex System
2) Level of Complexity 1 – Influential Complex System
3) Level of Complexity 2 – Reactive Complex System
4) Level of Complexity 3 – Proactive Complex System
5) Level of Complexity 4 – Adaptive Complex System

Level of Complexity 0 – Over-adaptive Complex Systems

These are entities that have adjacent roles to the environment which makes them work as "hygienic" entities.

They have no internal complexity because they follow the environment which implies that they establish an asymmetric complementation with positive slope. Over-adaptive systems are not complex.

Level of Complexity 1 – Influential Complex Systems

These are the complex systems that participate in isolated niches of the environment having the capacity of influencing the environment by providing elements that are perceived as necessary by the environment.

They are integrated by few interdependent objects and the open boundaries deal with a restricted isolated environment. Their level of complexity is given by the need to build complementary roles.

Level of Complexity 2 – Reactive Complex Systems

This level includes the complexity implicit in the previous level. These are complex systems that are organized to manage the influence of the environment without over-adapting.

These system are extremely efficient in their peripheral structure, which allows them to respond to the influence of the environment without losing their purpose and functionality. Their level of complexity if given by the need to manage the influence exerted by the environment.

Level of Complexity 3 – Proactive Complex Systems

This level includes the complexity implicit in the previous level. These are complex systems that exert an active influence on the environment in order to expand.

They are expansive entities that have developed a superior capacity to manage processes in a competitive environment that is basically defined by the biunivocal relationships

they need to manage. Their level of complexity is given by the need to manage biunivocal relationships with the environment.

Level of Complexity 4 – Adaptive Complex Systems

This level includes the complexity implicit in the previous level. These are complex systems that adapt to the environment that are driven by their capacity of building bridges between apparently incompatible needs.

They manage the capacity to build complementation at a superior level when the lower level fails. They are innovative entities that manage the conflicts with the environment by generating additional added value. Their level of complexity is given by the need to manage the future of the environment, the possibilities of the system and its complementation in changing environments.

Conclusion

All complex systems are organized by objects, which allow managing complexity. This is self-evident in a human body where each organ is an interdependent object to sustain the life of the human being.

Another example in social life can help to clarify this characteristic of the complex systems: the roles people assume work as objects in society.

This has several consequences:

1) A complex system is, by definition, constituted by interdependent objects.
2) When researching a complex system what needs to be researched are the objects of the system.
3) When a human built complex system has no established objects, it is transformed into an over-adaptive system.
4) To apprehend complex systems individuals need to be able to emulate their architecture in mind, which requires being able to deal with open boundaries and conjunctions while leaving aside the disjunctions implicit in value judgments.

Scientific applications of the Unicist Theory that expanded the boundaries of existing sciences by solving their complex aspects:

In Scientific Research - 1980: Development of a unicist ontological methodology for complex systems research, substituting the systemic approach to research adaptive systems. **2014:** The integration of the unified field of macro and micro behavior. **2015:** Development of the destructive and non-destructive tests to research adaptive environments.

In Life Sciences - 1988: Discovery of the functional structure that regulates evolution and the unicist ontological structure of living beings as a unified field. **2006**: Discovery of the unicist ontological algorithm of evolution and involution. **2008:** Discovery of the two types of integration, complementation and supplementation, of elements in complex adaptive systems. **2012:** Discovery of the unicist ontology of biological entities. **2013:** Confirmation of the unicist ontology of viruses. **2014:** Discovery of the ontological structure of chronic diseases. **2014:** Discovery of the structure of therapeutics. **2015:** Discovery of the ontological structure of health.

In Complexity Sciences - 1998: Development of the unicist ontology emulating the ontogenetic intelligence of nature. **2003:** Discovery of the anti-concepts that work as antimatter. **2006:** Development of objects to manage human adaptive systems emulating the structure of nature. **2011:** Discovery of the unicist ontology of complex adaptive systems. **2014:** Discovery of the behavior of objects in complex adaptive systems. **2015:** Discovery of the essential opposition but operational complementation between the active function and the energy conservation function of concepts.

In Information Sciences – 2002: Development of unicist ontogenetic based ontologies replacing the empirically structured ontologies. **2014:** Development of unicist adaptive robotics. **2015:** Development of prototypers.

In Future Research and Strategy - 1984: Modeling of the ontological structures that allow inferring the evolution developing the ontogenetic maps of human adaptive systems. **2014:** Confirmation of the functionality of ethical intelligence in future research. **2015:** Discovery of the unicist ontology of personal strategies.

In Logic - 1986: Development and formalization of the integrative and the unicist logic. **2013:** Functionality of Dualistic Logic in complex environments. **2013:** Discovery of the structure of aprioristic fallacies.

In Anthropology - 1986: Discovery of the "invariables" of human behavior. **1997:** Discovery of the double dialectical behavior. **2008**: Discovery of the anthropological lifestyles. **2010:** Discovery of the institutional and social viruses. **2012:** Discovery of the integration of ontogeny and phylogeny. **2012:** Discovery of the stagnant survivors' role in societies. **2012:** Discovery of the unicist ontological structure of aptitudes, attitudes and intentions. **2013:** Development of the unicist ontology of cultural adaptiveness & over-adaptiveness. **2014:** Synthesis of Conceptual Anthropology.**2014:** Discovery of the Cultural, Institutional, Individual and Social Archetypes. **2015:** Discovery of the functionality of rationalism and subjectivism as social and individual addictions.

In Economic Science - 1989: Discovery of the unicist ontological structure of Economics. **1998:** Discovery of the unicist ontological algorithm of the price elasticity of demand. **2004:** Discovery of the ontogenetic structure of economic models and their functionality. **2011:** Discovery of the ontology of currency and inflation. **2012:** Discovery of the ontology of the industrialization level. **2012:** Discovery of the unicist ontology of the overcoming of scarcity. **2012:** Pricing of Futures and Options. **2012:** Discovery of the unicist ontology of speculative manipulation. **2014:** Synthesis of Conceptual Economics. **2015:** Discovery of the unicist ontology of economic freedom.

In Political Science - 1990: Development of the ontological algorithm and the ontogenesis and phylogeny of ideologies and their functionality. **2013:** Development of the unicist ontology of Social, Economic and Political Democracy.

In Social Sciences - 1993: Discovery of the collective unconscious and the unicist archetypes of cultures. **2012:** Discovery of the role of stagnant survivor elites in the stagnation of segments or cultures.

In Linguistics – 2004: Discovery of the unicist ontological algorithms of natural, ambiguous and figurative languages and the unicist ontology of words. **2014:** Development of semantic objects. **2015:** Discovery of the ontological structure of subliminal communication.

In Mathematics - 1996: Development of the conceptual basis of interdependent, dependent and independent variables. **2014:** Development of the mathematical foundations of reality indicators.

In Philosophy - 1994: Development of the unicist ontology integrating philosophy, science and action in a unified field. **1997:** Refutation of Hegel's and Marx's dialectics and the formulation of the laws of the double dialectics.

In History - 2000: Development of a historical analysis methodology based on the unicist double dialectics.

In Cognitive Science - 2001: Development of a methodology to construct knowledge with existing information through an integrative logic. **2002:** Development of the unicist reflection methodology to deal with the nature of reality. **2006**: Discovery of the object driven organization of mental processes and the development of cognitive objects. **2008:** Development of the ontological algorithms of fundamental analysis. **2013:** Development of the unicist ontology of erudition and wisdom (observers vs. participants). **2014:** Discovery of the structure of the emulation of reality. **2015:** Discovery of the unicist ontology of conceptualization.

In Education - 1979: Discovery of the ontogenetic algorithms of learning which has given scientific sustainability, amongst others, to Piaget. **2014:** Discovery and development of learning objects. **2015:** Development of Reflection Driven Education.

In Psychology - 1984: Discovery of human ontointelligence to deal with adaptive systems. **2003:** Discovery of the unicist ontological structure of fallacies, the functionality of anti-intelligence and anti-intuition. **2004:** Discovery of the double dialectical thinking process. **2005:** Discovery of the unicist ontology and evolution laws of human essential complexes. **2011:** Discovery of the ontology of conscious behavior. **2012:** Discovery of the ontology of complementation of thinking processes. **2012:** Discovery of the unicist ontology of psychopathy. **2014:** Discovery of the structure of subliminal decision-making. **2014:** Synthesis of Conceptual Psychology. **2015:** Functionality of concepts as behavioral objects.

In Semiology - 2012: Discovery of the unicist ontology of semiosis as a complex adaptive system. **2015:** Development of semiotic role objects.

Access the application of the
Unicist Logical Approach to Complexity:

www.unicist.net/clipboard

Books by Peter Belohlavek that refer to Complexity Sciences and their application.

1. Australia's archetype
2. Brazil's archetype
3. Butterfly Companies & their cure
4. Complexity Science: Unicist Research & Design of Human Complex Adaptive Systems
5. Design of complex systems research
6. Development of Consciousness through Action
7. Dualistic Logic vs. Unicist Logic
8. France's archetype
9. Fundamentalism
10. Germany's archetype
11. Globalization: the new tower of Babel?
12. Growth Crisis 2008-2010
13. Influencing Nature
14. Innovation
15. Institutionalization
16. Introduction to the nature of perception and credibility
17. Introduction to the unicist ontology of evolution
18. Introduction to Unicist Business Therapeutics
19. Introduction to Unicist Diagnostics
20. Introduction to Unicist Econometrics
21. Introduction to Unicist Market Segmentation
22. Introduction to Unicist Object Driven Entrepreneuring
23. Introduction to unicist thinking
24. Knowledge, the competitive advantage
25. Mind Traps that hinder personal evolution
26. Natural Organization of Outsourcing and Insourcing
27. Ontointelligence
28. Peopleware: The Integrator of Hardware and Software
29. Real Diagnostics vs. Paradoxical Diagnostics
30. RobotThinking
31. Social Critical Mass in Business
32. Sweden's archetype
33. The Book of Diplomacy
34. The Ethic of Foundations
35. The Nature of Big Change Management
36. The Nature of Democracy
37. The Nature of Developed & Developing Countries
38. The Nature of Diplomatic Power
39. The Nature of Dissuasion Power
40. The Nature of Doers
41. The Nature of Economic Power
42. The Nature of Ideologies
43. The Nature of Social Power
44. The Nature of Unicist Business Strategy
45. The Nature of Unicist Object Driven Business Growth
46. The Nature of Unicist Object Driven Change Management
47. The Nature of Unicist Object Driven Institutional Immune Systems
48. The Nature of Unicist Object Driven Leadership
49. The Nature of Unicist Object Driven Management
50. The Nature of Unicist Object Driven Marketing
51. The Nature of Unicist Object Driven Organization
52. The Nature of Unicist Reverse Engineering for Object Design
53. The Ontogenesis of Evolution: The Unicist Ontology of Evolution
54. The Ontogenesis of Knowledge Acquisition: The Unicist Ontology of Human Learning
55. The Origin of Human Fallacies
56. The Path of the Architect
57. The Power of Nations
58. The Unicist Approach to Businesses
59. The Unicist Ontology of Ethical Intelligence
60. The Unicist Ontology of Evolution
61. The Unicist Ontology of Family Businesses
62. The Unicist Ontology of Human Capital Building
63. The Unicist Ontology of Network Building
64. Unicist Anthropology
65. Unicist Business Architecture
66. Unicist Business Diagnostics: The Compendium of Ontologies for Business Diagnostics
67. Unicist Business Objects Building: An Ontology based and Object driven Technology
68. Unicist Business Strategy
69. Unicist Business Strategy: Ontology based and Object driven Business Strategy
70. Unicist Business Therapeutics: Ontological based and Object driven Therapeutics
71. Unicist Confederation: Cooperation in Diversity
72. Unicist Country Archetypes
73. Unicist Country Future Research
74. Unicist Country Scenario Building: Ontology based Country Scenario Building
75. Unicist Future Research
76. Unicist Logic and its mathematics
77. Unicist Marketing Mix

78. Unicist Marketing: Ontology based and Object driven Marketing
79. Unicist Mechanics & Quantum Mechanics
80. Unicist Mechanics: Business Application
81. Unicist Object Driven Diagnostics
82. Unicist Object Driven Learning
83. Unicist Object Driven Management
84. Unicist Object Driven Marketing
85. Unicist Object Driven Negotiation
86. Unicist Object driven Strategy
87. Unicist Ontogenetic Algorithms to solve business problems
88. Unicist Ontogenetic Intelligence of Nature
89. Unicist Ontology of Evolution For All
90. Unicist Ontology of History: Unicist Methodology for Historical Research
91. Unicist Ontology of Language
92. Unicist Ontology to deal with Adaptive Systems
93. Unicist Organization: Object Driven Design
94. Unicist Organization: Ontology based and Object driven Organization
95. Unicist Organizational Cybernetics
96. Unicist Personalized Education
97. Unicist R&D of Adaptive Systems in Business
98. Unicist Reflection to focus on solutions
99. Unicist Reflection: The path towards strategy
100. Unicist Standard for Adaptive System's Pilot Testing
101. Unicist Standard for Business Benchmarking
102. Unicist Standard for Business Growth
103. Unicist Standard for Business Objects Building
104. Unicist Standard for Critical Mass Building
105. Unicist Standard for Human Adaptive Behavior
106. Unicist Standard for Ontological Business Diagnostics
107. Unicist Standard for Ontological Business Modeling
108. Unicist Standard for Ontological Change Management
109. Unicist Standard for Ontological Leadership
110. Unicist Standard for Ontological Scenario Building
111. Unicist Standard for the Ontological R&D of Adaptive Systems
112. Unicist Standard Language
113. Unicist Standard Language: To design, build and manage Human Adaptive Systems
114. Unicist Standard to deal with the Ontology of Learning
115. Unicist Standard to deal with the Ontology of Personal Evolution
116. Unicist Standard to Manage the Ontology of Businesses
117. Unicist Standard to Research the Ontology of Human Adaptive Systems
118. Unicist Thinking

The Unicist Research Institute

Peter Belohlavek is the creator of the Unicist Theory and the founder of The Unicist Research Institute, a private global research organization specialized in complexity sciences, that has an academic arm and a business arm.

He was born on April 13, 1944 in Zilina, Slovakia. His basic education is in Economic Sciences. To apprehend "reality" as a complex unified field he completed his education with research driven guided studies in Psychology, Epistemology, Anthropology, Economy, Education, Sociology, Life Sciences and Management.

The Unicist Theory made adaptive systems manageable and gave an epistemological structure to complexity sciences. This theory established a new starting point in science which expanded the possibilities of human influence in adaptive environments. This is a new stage like the stage that was opened by the Theory of Relativity.

This theory allowed managing the adaptive aspects from Life Sciences to Social Sciences. Its application provided the four scientific pillars to develop the unicist technologies: Conceptual Economics, Conceptual Anthropology, Conceptual Psychology and Conceptual Management.

As it is known, the management of complexity has been an unsolved challenge for sciences. Science dealt with complexity using multiple palliatives but without achieving consensus of what complex systems are.

This challenge has been faced in 1976 at The Unicist Research Institute, which became a pioneering organization in the development of concrete solutions to manage the complex adaptive systems by developing a logical approach that uses the Unicist Theory.

He discovered the intelligence that underlies nature, which gave birth to the Unicist Theory, and the ontointelligence that defines the roots of human intelligence. These discoveries and develop-

ments expanded the possibilities to upgrade education, to influence social and institutional evolution and to deal with markets.

The unicist logical approach expanded the boundaries of existing sciences. The Unicist Theory was used to develop applications in Life Sciences, Future Research, Business, Education, Healthcare and Social and Human behavior. Now complex adaptive systems became manageable and complexity science received its epistemological structure.

Among other roles, he leads the Future Research Laboratory of The Unicist Research Institute. It is a space to give access to information on country archetypes, future scenarios and trends to the worldwide community. (More information: http://www.unicist.org/peter-belohlavek.php)

The Unicist Research Institute was the pioneer in complexity science research and became a private global decentralized leading research organization in the field of human adaptive systems. http://www.unicist.org/turi.pdf