The Unicist Ontology of Intellectual Capital

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Abstract: Assessing Intellectual Capital (IC) without diagnosing its nature always turns out to be a fallacious path. The unicist approach to IC building structures the concept of IC in order to define its nature and catalyze its development.
Intellectual capital is defined as the capital that is based on differential knowledge which can be materialized in human capital and objects.
This paper presents the unicist ontology of Intellectual Capital as the integration of: Objects, Human Capital, Credibility and Innovation.
In this sense, human capital is represented by the individuals' capacity to improve efficacy, synergy and the return of investment to a point where the strategic goals, the mission and the vision of the company are achieved or fulfilled.
On the other hand, an object is defined as an entity, which carries an implicit extrinsic concept that adds value, and has its own quality assurance system.
This paper is based not only on the ontological background of IC but also on its applications to more than 200 institutions and the research works of The Unicist Research Institute.
This work is centered on taking IC as a complex system and understanding its nature as such. Unicist Ontology-based diagnoses showed the benefits of understanding the nature of IC in order to capitalize both the value generation and innovation within the organization.

Keywords: Intellectual Capital, Objects, Human Capital, Unicist ontology, Complex systems.

Introduction

Many controversies have been created along developing Intellectual Capital which in some extend depend, on the one hand, on the conventions used to define it and, on the other hand, on the urgent necessity to capitalize it which turns out to generate fallacious scenarios.
Developing Intellectual Capital (IC) is a complex matter. It could be defined as a complex system with open boundaries, and therefore it does not respond to univocal cause-effect relations as do simple systems. IC does not play by the same rules.
But when does IC begin to be such? Not all intellectual matters are to be considered Capital. This paper presents the unicist ontology of Intellectual Capital as the integration of: Objects, Human Capital, Credibility and Innovation to define its nature.

The Unicist Ontology of Intellectual Capital

Although many different definitions of Intellectual Capital have been given, the problem arises not from them but from the preconception [1] in their understanding. Conventions are useful if the criterion of such conventions is shared by its users.
The unicist approach to IC building structures the concept of IC in order to define its nature and catalyze its development.

The intellectual capital is defined as the capital that is based on differential knowledge that can be materialized in human capital and objects. In this sense: patents, brand, models, methods, intellectual property, industrial secrets, data bases, information on clients, etc. are to be considered.

In this sense, human capital is represented by the individuals' capacity to improve efficacy, synergy and the return of investment to a point where the strategic goals, the mission and the vision of the company are achieved or fulfilled.
On the other hand, an object is defined as an entity, which carries an implicit extrinsic concept that adds value, and has its own quality assurance system.

Intellectual capital is defined by the integration of the following concepts:
-Objects
-Human Capital
-Credibility
-Innovation

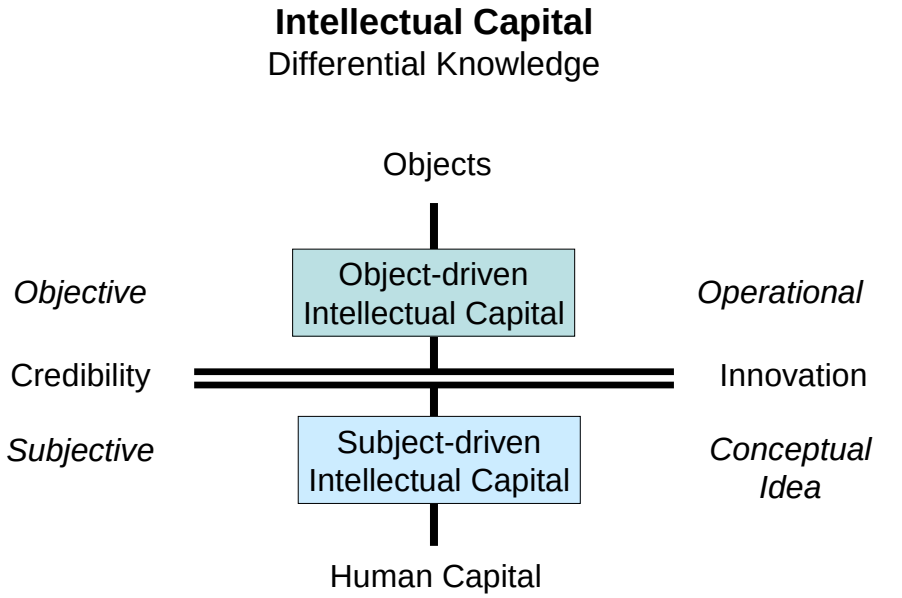

Image 1: The conceptual structure of Intellectual Capital

As IC is based on differential knowledge that can be materialized in human capital and objects, companies can take different approaches towards the development of intellectual capital: they can either be predominantly object-oriented, or predominantly centered on human capital. And in the process of constructing "Differential knowledge" they lean on "Credibility" to build secure, plausible knowledge (through human capital or objects) and at the same time they seek "Innovation" to overcome scarcity.
While in all the companies that have been studied both approaches coexist, there is always one which is predominant.
On the one hand, companies that are predominantly centered on human capital use conceptual ideas to develop innovations and seek a context of subjective credibility to develop IC within the organization. These companies are centered on human capital building as a way to construct their "differential knowledge" in the market.
But on the other hand, predominantly object-oriented companies are centered on implementing operational innovations and base their success in the objective credibility (both of their operational innovations and objects). These companies are centered on developing objects as their strongest IC.

These two approaches respond to different rules of the game. In the object-driven approach, IC is predominantly assessed through the added value of objects that act as operational innovations and have a functional objective credibility context that fosters their development.
On the other side, the subject-driven approach is focused on Human Capital as a generator of innovations to improve efficacy, synergy and the return of investment according to the companies' goals.
Understanding the nature of both models helps companies to focus on the possibilities of developing each.
But it is important to keep in mind that while Subject-driven IC is the base or pillar to start any IC development project, it is only Object-driven IC the one that fosters IC expansion in the environment.

Intellectual Capital as a Complex System
The Unicist Approach to Complexity

In order to understand the nature of Intellectual Capital it is necessary to understand the nature of complex systems.
The unicist approach transforms complex problems into simple solutions, and these simple solutions into "easy" actions.
This approach defines 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 [2]:

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 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.

"The Unicist Ontology of Evolution", the "Unicist Logic" and the "Logic of Fallacies and the Anti-concepts", made the conceptual modeling and operation of complex systems possible.
Some examples of complex 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 operative 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 operation 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.

Method

The unicist ontological approach of a complex problem requires the existence of two important elements:

- A “reflective” approach, fundamental for arriving to the ontology of a certain reality.
- A strict method for the building of hypotheses, their validation and “falsification”.

Reflection - Pilot Testing

Reflection tries to find the causative structures of reality, objective and/or subjective, to develop feasible action guides which also provide added value. Thus, the concepts “governing” a certain reality are sought after.
Unlike meditation, reflection aims at the fact of the individual being in peace both with himself and the environment. Reflection supports the environmentally adapted individual to exert influence on the environment while he is also influenced by it.
Reflection differs from the rational analysis as regards methodology and scope. The rational analysis allows finding all the rational measurement objective elements of a reality and developing action guides according to them. [3]

In its first phase, group reflection includes the following stages:

1) Stating each person’s point of view.
2) Disqualifying the other’s point of view due to its being subjective and without any foundation.
3) Discussing each person’s foundations in a subjective way.
4) Reflecting over the other’s foundation and our own.
5) Making everyone’s foundations relative.
6) Developing the hypothesis of the causative relationships which one seeks to influence.
7) Contrasting already discovered concepts.
8) Carrying out pilot tests in the real world.

Pilot tests

Pilot tests are the drivers of the unicist reflection processes. Pilot tests have two objectives:
1) Validation of knowledge
2) Falsification of knowledge

1) Validation – Non-destructive testing

Validation implies the factual confirmation of the validity of knowledge. Validation is achieved when knowledge suffices to influence in a predictable way a certain reality.
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.
Validation provides a reliable knowledge to operate under controlled conditions. The knowledge is valid if the conditions of the application environment are analogous and homologous to the characteristics of the validation environment.

2) Falsification – Destructive testing

Falsification, in the field of complex problems, implies to find 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.

Two elements are homologous when they have the same “nature”. A whale and a dog (an extreme example) are homologous if they are considered as mammals. A dollar and a yen are homologous considering that they are both money.
These two cases demonstrate that homology can be total or partial. When the knowledge necessary to influence a reality is falsified in a totally homologous field, then it is naturally secure knowledge. The extreme condition of this example is the homology of two identical elements.
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.

Pilot tests: destructive and non-destructive tests
Pilot tests must include both non-destructive and destructive tests. The higher the reflection level, the more significant the destructive test. The application of destructive tests requires being aware of the concepts of the realities where tests are applied.
Knowledge is secure when its validity and its limits were found. Exceptions to this rule are universal natural laws which are “universally homologous”.
These laws are the fundamentals that enable the design and development of the pilot tests to reflect on lower-level knowledge.

Research

The concepts research requires conscious experience in the field being investigated into. It is only with this experience that the development of hypothesis becomes possible. The research methodological steps are:

1) Development of the hypothetical structure of the functional concept
2) Analysis of the concept and its division into sub-concepts (only if necessary and possible)
3) Decomposition of the concept parts in their observable facts
4) Development of application fields for using the concept to validate its behavior
5) Development of concept application experiences to forecast reality.
6) Development of at least five experiences in the concept application fields which are completely different to each other
7) Development of predictions of at least three periods with total accuracy
8) Restarting of the research process before any deviation

Intellectual Capital through an Object-driven perspective

An object is an entity, which carries an implicit extrinsic concept that adds value, and has its own quality assurance system.
It can be physical or virtual, simultaneously or successively reusable.

Consequences of this definition: [4]
- An object is an object only if it is reusable.
- There is only an object if it has a quality assurance in itself.
- Every object is designed to belong to one or several classes.
- Physical objects are successively reusable.
- Virtual objects are successively and simultaneously reusable.

The structure of an object implies a concept, a value added to the environment where it operates and an assured quality which makes it absolutely reliable.

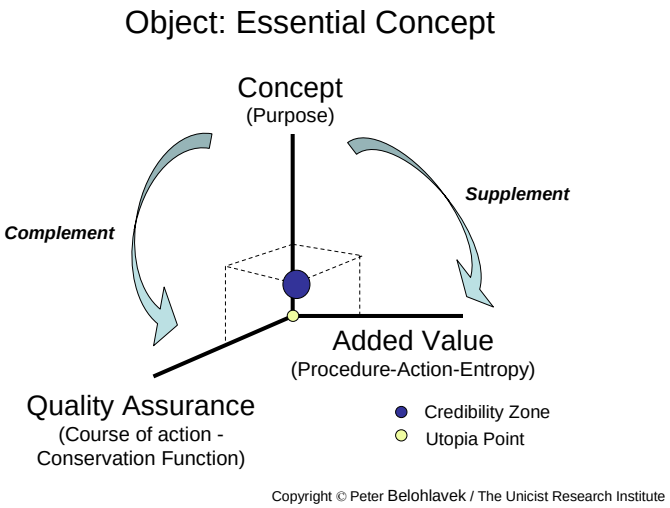

Image 2: The Conceptual structure of an “Object” (Unicist Logic)

The concept

A concept is defined by its purpose, its procedure and its course of action. There are always a “substantive” function, and action upon the environment and an adverbial function which tries to prevent the action upon the environment from deviating from the purpose.
The concept of an object defines, due to the broadness of its purpose and procedure, the unified field of analogous applications. Because of the functionality of its purpose, it defines the broadness of the homologue applications.
The concept of an object requires a very deep and subtle apprehension. Should it not be consistent, the object becomes an “operational thing” or procedure which lacks an object’s characteristics, and its reusability and quality assurance are uncertain.

Added Value

The object adds value as a key action. It is there to add value. This added value has objective and subjective aspects, as well as costs. When the added value is reusable, the object has a cost, which is distributed among all its uses or the number of times it is used.
When the subjective added value is significant, the value of the object increases. The subjective added value is related to the use value, the reference value and the opportunity value.
The added value definition determines the operative functionality of an object and it is the basis for its analogous applications. In the analogous applications, it is necessary to integrate the object’s remaining elements, i.e., its concept and quality assurance.
The utility, functionality and redundancy of the processes briefly determine the added value.

Quality Assurance

Quality assurance depends on the capacity of handling the added value development redundancy. Redundancy should be analogous so that the results of the quality assurance can be guaranteed from an operative viewpoint.
The moment the processes are developed mainly determines the assured quality. If they are out of time, they are useless; they should be considered undelivered.

The chronological time control for the object processes to occur mainly determines the added value of an object.
However, it requires a constant tuning with the objective implicit in the concept so as to prevent the object from generating added values, which actually do not correspond with the purpose for which it was created.

Structural Segments

The structure of the "object" concept determines the large groups of objects that exist and have a different functionality and use.
Actually, every object includes those aspects. That is why in the graph, the "object" is defined in the center acquiring aspects from all the different possibilities. However, there is one predominant aspect that determines its functionality and perception.
The structure is defined as follows:

Structure of the concept "Object"

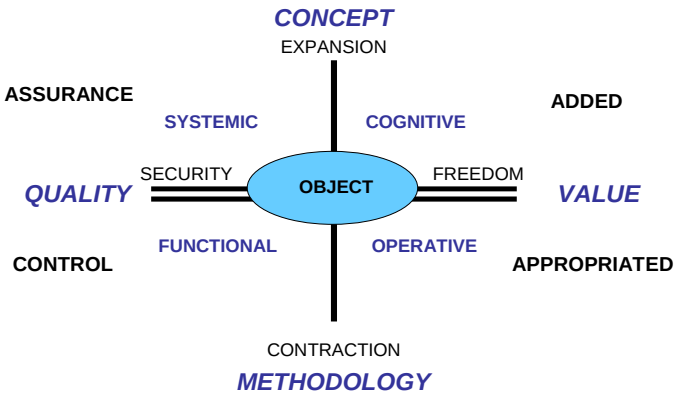

Image 3: The conceptual structure of different types of objects

Operational Objects

They are those whose aim is to gain value for the people handling them. This means that the operative objects should produce "incomes".
Operational objects are centered on processes, with non-ambiguous methodologies and implicit quality control systems.
Every object needs to have operational aspects that are useful for the client system to appropriate value since they generate the operation and results.
There are objects that only have operational aspects, and they are those that have the highest obsolescence speed due to the change in technologies/methodologies.
Examples of Operational Objects could be found in a calculator, in sales procedures (selling techniques centered on processes), etc.

Functional Objects

They comprise objects that have functionality, an intermediate stage between a concept and its operation.
The functional object allows the intermediation of the value addition, so that it can be later used to develop the operative added value.

Functional objects are often interfaces with other objects, links between objects, analyzers of objects, and comply with all the functions that link the implicit concept in the objects and their operation.
Examples of Functional Objects are: Internet (the World Wide Web); data bases with information on clients, most management software that link knowledge with operation, etc.

Systemic Objects

They are complex objects that develop an added value in themselves.
They generate an energy transformation in such a way that it cannot be used to add value to a function other than the implicit in the object's purpose.
They are transforming systems; therefore, they have a high entropy level. Their quality assurance systems are quite basic to be reliable.
Their failures result in considerable energy losses. Therefore, their purpose must be clearly defined as well as the analogous and homologous fields where the energy transformation is produced.
Examples of Systemic Objects are: a car that transforms caloric energy into kinetic energy, an energy generator, a brand transforming image into social capital, etc.

Cognitive Objects

Cognitive objects are those that turn information into knowledge.
Knowledge is what allows the value generation. Knowledge is defined as the ability that allows the generation of added value out of the available energy level in a specified field.
Cognitive objects are always virtual and simultaneously reusable. The characteristic of a cognitive object is the security of its knowledge, both from an ontological and teleological point of view.
Secure knowledge refers to the knowledge where there is a certainty that the logical structure of the information produces knowledge. Cognitive objects enable the construction of systemic, functional and operative objects. They are the basis for the quality assurance systems of the other objects.
Examples of Cognitive Object are: books, industrial secrets, concept maps, taxonomies, methodologies that are the basis for the quality assurance system of other objects, etc.

Implications

The concept of objects establishes a conceptual way of handling the value generation processes so that their quality increases according to the "objectization" within the working processes; productivity increases due to a higher efficiency in the process and the reuse of objects. The perceived value rises because of the reliability in the client system.
However, designing by means of objects implies a very clear notion of the concept of the process that is being built and the context where it is inserted. Designing by means of objects implies an increase in the amplitude of the operating unified field that requires a broader knowledge of reality.
When the conceptual knowledge of a given reality is reached we can structure cognitive objects that remain throughout the times and evolve slowly. The Unicist Ontology of Evolution lays the necessary conceptual groundings to construct stable and secure cognitive objects, which are required to forecast the reality whose knowledge they structure.
Cognitive objects are the bases for the building of systemic, functional and operational objects.

Intellectual Capital and Innovation

Whether a company develops cognitive objects or systemic objects, the capacity to innovate defines the organization's potential to increase its IC.

Innovation is the basis for economic growth. Essentially, countries, cultures, institutions and individuals grow only in the fields where they are open to innovations.

Structure of the concept “Innovation”

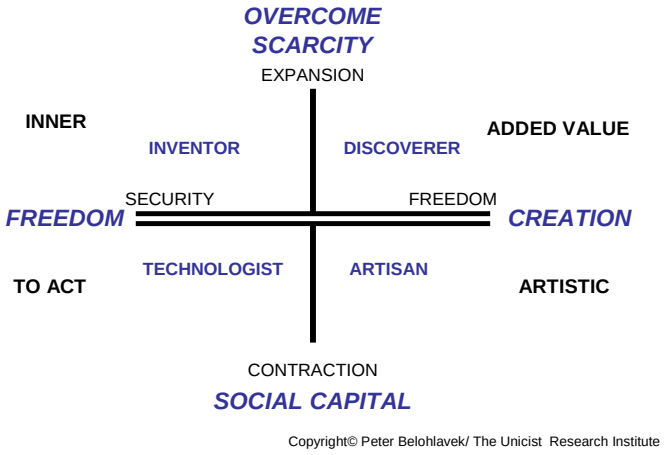

Image 4: The conceptual structure of “Innovation”

There might be innovation builders or innovation users. While in both cases the growth effect is similar in the short run, in the long run, stable expansion is based on the capacity to innovate.
The essential concept of innovation describes it as a way towards growth based on the capacity to overcome scarcity sustained by the social capital reinforced by the innovation. [5]
The purpose of innovation is to overcome scarcity. Only people or cultures, who have the will, find the way to overcome scarcity: this is the cultural context that fosters innovation.

The knowledge companies and the use of objects

During the applications of IC development methodologies and catalysts the creation and reuse of objects defined the companies’ orientation towards innovation and IC building. The so called “knowledge companies” were bent toward IC development in the way that they shared some institutionalized behaviors.

The following facts were observed:

Power-centered companies	Knowledge companies
-Existing objects are not used	-Creation of shared objects
-Objects threaten individuals	-The reuse of objects is fostered
-Recreation of existing objects is done without groundings or foundations of the changes	-Recreation of objects is based on groundings or foundations
-There is no conceptualizations of what is being done	-There is a conceptualization of the purpose, the action guide and the procedure of IC development
-Foundations’ value is based on hierarchy	-Foundations’ value is based on: the reasonability, understandability and plausibility of an argument
-Fosters personal bonds	-Fosters innovation
-Pushing strategies	-Fosters the use of catalysts*

***The use of catalysts in complex systems**

The unicist approach to IC development fosters the use of catalysts to accelerate processes within the organization. Institutional systems behave as complex systems, and therefore their evolution cannot be "pushed", instead it can be catalyzed. Simple systems can be modified in their structure and content, that is why they do not evolve, they just change.

Catalysts are systemic objects that transform energy without integrating the system they catalyze [6].
Organizational Catalysts are business and process-dependent, that is why what can work as a catalyst in a business process may not work in another.

Human Capital

Human capital is represented by the individuals' capacity to improve efficacy, synergy and the return of investment to a point where the strategic goals, the mission and the vision of the company are achieved or fulfilled.

Unicist Human Capital Building

$$UHC = Efficacy * Synergy * ROI$$

Efficacy = Role * Task * Knowledge

Synergy = Individual capacity * Team work * Added value Work

$$ROI = \frac{\text{HR's ROI}}{\text{Company's ROI}}$$

Image 5: Unicist Human Capital Index

The research on human capital defined the index of human capital as a complex system.
This index uses the conjunction of the 3 sub-concepts of Human Capital: efficacy, synergy and the return on investment. Using the unicist logic and complex systems mathematics, the 3 factors are multiplied.
According to this model, the UHC index is defined by the multiplication of efficacy, synergy and the return on investment. Each value is defined from 0 to 1.
This UHC index showed to be useful:
-To compare with other companies
-To decide whether to invest on training programs for the company members.
-To decide whether to organize on the basis of efficiency or efficacy. If it is not possible to improve the efficacy index, then it becomes necessary to work on the efficiency index.

The use of the UHC index

We need to keep in mind that this index is composed of 3 indexes. Each index has a value that goes from 0 to 1. Any deviation from the required value lowers the index.
Deviations on the "role" index (which is defined by the consistency between the role taken and the role required by an individual) will impact on the efficacy index and then on the UHC index.

Every term in this equation has a major impact on the final UHC index, since these 3 factors are multiplied following the complex systems mathematics.
A deviation on the term called “team work” (which is determined through the real team work orientation versus the required team work in the company) also has an impact on the result.
Teaching-oriented programs showed no impact on this index, because there were no improvements on role identification and individuals’ knowledge after the end of such programs and the ROI could not be measured.
Instead, learning-centered programs that defined a ROI index implied the individuals’ commitment on learning and a tendency to the improvement of the efficacy and the synergy index.

Credibility

In operational terms, IC is measured in the capacity to innovate and in the credibility within the environment, which make “Intellectual matters” become CAPITAL.
The credibility is measured in the market, because it defines the context that does or does not make IC exist as such.
Generating this credibility context is a key factor to place innovations in the environment.

According to the unicist ontology of credibility, this functional concept is defined by:
- The existence of an authoritative context
- The need to believe
- The expectation of occurrence (possibility)
- The proof

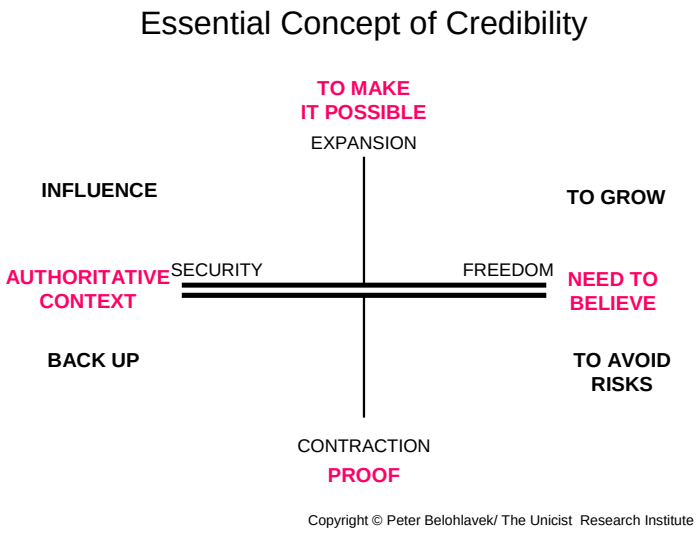

Image 6: The conceptual structure of “Credibility”

Building credibility is a very complex and detailed matter.
It is only possible to build credibility in a context in which what is being introduced is being expected, covers the necessities and is convenient [7]. These are preexisting conditions for the building of credibility.
When these preconditions are not granted, building credibility takes a long time and economic efforts and at the same time could generate paradoxical results.

Inconsistencies threaten all credibility contexts and create fertile soil for suspicious. While this scenario is the case, Intellectual Capital has no context for its development.

Intellectual Capital Development

The difficulty in developing intellectual capital resides in the capacity to understand its nature, to identify differential knowledge through innovation and at the same time generate a credibility context in the environment.
The fact that an element could not be measured does not mean it has no value. It means that because of its lack of measure it may result in a tendency to fall into fallacious conceptions regarding the assessment or even have credibility problems. And in this matter companies and individuals may have the problem of finding the best way to build credibility.
Only those who believe in their own personal intellectual capital can approach this problem intuitively and research it.

Conclusions

Capitalizing knowledge through objects is the challenge of every leading organization and individual. The creation and the reuse of cognitive objects (i.e.: methodologies, methods, models, etc) defines the orientation towards IC expansion in organizations.
But understanding the nature of IC in each organization means understanding its business and the value generation process measured in the market – innovation and credibility - and using the proper catalysts to accelerate value generation processes.
Whether we are dealing with a global company, a master franchise or a small business, IC building is an everyday task. It involves fostering innovation within the organization and dealing with the ambiguity of complex systems.
Using the unicist approach we can profit from the benefits of understanding the nature of IC in order to capitalize both the value generation and innovation within the organization.
While Subject-driven IC is the base or pillar to start any IC development project, it is only Object-driven IC the one that fosters IC expansion in the environment. Object-driven Intellectual Capital turns conceptual ideas into operational innovations, turning subjective credibility into objective credibility.
Generating expansive contexts for IC development means that men are capable and willing to generate knowledge through objects that transcend themselves.

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