Journal of Theoretics

Science without theory, is Science without direction.

Mission Statement: The **Journal of Theoretics'** mission is to advance scientific inquiry and knowledge by publishing credible peer-reviewed articles in the field of Theoretics, free of charge and accessible to all. Theoretics is the scientific field of endeavor which incorporates science, logic, and language, in order to develop, improve, and advance scientific theory. The better the theory development, the better the science. [The Journal of Theoretics is a nonprofit scientific peer-reviewed journal. ISSN: 1529-3548.]

GLOBAL COMPREHENSIVE THEORY

Zdravko Carev [1] zdravko.carev@st.hinet.hr
Dobromir Bonacin [2] dobromir.bonacin@st.hinet.hr

[1] Faculty of mech.engeneering and naval arch.(Postgraduate student) – Zagreb. Croatia
[2] Faculty of kinesiology (Doctoral student) – Zagreb, Croatia

Abstract

Logicaly, learning in nature is not different than learning of any other type of matherial. Basics of any learning are defined by integrity of tree komponents: a) matherial, b) entity (subject) which learns and c) partial learning genarator (teacher, coach..) which defines methodical partial tasks. All together includes programed transforamtion process. If we assume that we knew characteristics of subjects enough, and if we assume that we knew enough about the activity, the problem of process control is defined by dekomposition of global process to its subprocesses, ie. recognition of learning objects that represent specific clusters of learning types. Any real transformation process in nature, is obviously based on two main methodical knowledges, learning methods and excersise methods. It is not possible to establish qualitative movement control and regulation without those two methodical priciples, which are integrated in order with type of activity, expected intensity, subject status, final aims, etc. It is absolutely sure that the optimal learning is fundamental principle at all. In this moment we can recognise many learning theories. In this article, we present rounded Global Comprehensive Theory which integrates all known learning approches and brings new quality with clear benefit in all transforamtion processes.

All entities, from simpliest forward to complex ones are exposed to surround influence. To recognise whith what they surrounded are, those entities develop sensors. Those structures we call analitical structures. Time and space interaction of these sensor data generates relations, meaning higher level of data syntesis. Higher number of such relations generate new structures invariant of initial conditions and information. These structures are hierarchialy organised and we call it models. Bulk of different but stable models, provide forming of truth laws. Finaly, each entity generate interaction (called expansion) with other entities in defined space, and together (as supra-entity) tried to establish harmony with whole world. On the basis of the entities projections to clusters this charactestics were recognised as : Communicativeness, Expansion, Level of Organisation, Coherence, Stableness and Harmony. This paper offer the regularities (rules), that is, the universal parameters of a characteristics that are transparent and easily applicable in many situations and in any field.

Introduction

Usualy, identification of any global and universal parameters is connected with many problems, and among them with most frequent problem – a number of entities. Because of a small number of objects in process, usualy the results of data analysis are unstable and unreliable. And similar, unappropriate methods derive results which lead to only partial problem solutions which are unsufficient for anything global. So, in sense of this work, many references point to univariate results, which is also unappropriate for anything more. Logicaly, until this point, everything is fine in science. But, now, it seems as a contradictive situation. It is very complicate to identify more higher levels of entities organisation (human characteristics, social phenomena...) without precise experimental conditions, and in the same time is not possible to find global rules by exploring entities with lover organisation levels (eg. atomic, subatomic levels an so on). Fortunately, situation is clear and simple. More complicated entities gives us an opportunity to conclude about Universe rules if we start with adequate methodology. First of all, we must reject chaotic definitions, which means that deterministic approach is not only a one approach, but is only one that exists.

That is because we can easily prouf that the chaotic area of problem solution is not included in real scientific discussions. The chaos does not exist. We have no right to reference our solutions as "chaotic solutions" if we can not find clear logical proufs of our conclusions. It is not possible to confirm that we are extended from chaos to determinism. Everything is connected with everything, although sometimes with very very small interference. But is connected ! If the chaos realy exists, we will not be able to anticipate anything, and there are no relations at all. As we all know, we can anticipate many things that will come in the future. That means : chaos is only a wrong presumpsion in many situations whan scientists can not continue exploring nature rules because of individual or group comprehensive limits. And, that is not because of a chaos as it is, that is because of our actual human imperfection.

So, whan we define a sensor, we assume that the sensor is a mechanism necessary to generate primar reception of some phenomena and to translate it to clear signal (analysis). Connection of different signals from different sensors generate relations (sysnthesis). As we all know, complicate phenomena is not possible to recognise on the basis of simple signals and relations, so entitty combine variate relations to generate stable models (modeling). In technical sciences we can find many references about this conclusions. Based on all that information, we started to generate the most complicated theoretical approach, with aim to explore any higher levels of comprehense, and to define a new universal theory which can explain all phenomena that ever existed, that exist now, and that will ever exist. We named our thinking : Global Comprehensive Theory.

Methods

"Hierarhical and multivariate experimental models easily become irreplaceable part, not only of a scinetific thinkings, but our everyday's attitudes and thinking too. Through them we can understand phenomena which surround us with much more precision, forming image of a Universe more and more like a real World is, according with our individual level of comprehense" (Bonacin 2000).

The idea was to use the model of simulating existence of pseudo-objects (entities) in a finite space, and to successfully recognise and describe types of entities (clusters). In the broadest sense, typology imply the stabile parameter values which are invariant on further influences of any kind. This implicitly means that there are some final and universal charactersitics which do not change – i.e., those are the laws in the nature. This is the reason why some previously set parameters – the variables by means of which these objects are measured – are used to describe and to monitor the objects. Under the classical cybernetics definitions, we are talking about compound of methods that guide us to some type of status definition and regulation, as shown by Momirovic at all. (1987.). Considering those methodological principles it is evident existence of whole group of procedures for system analysis and system identification with final aim to recognition analysis. Some basic examples are presented in works of Carev (2000.). In the same broadest sense, a measurement implies any operation that, in congruence with a complete and accurate set of rules, makes it possible to allot a sign or a number that relates to a particular characteristic to an object which is a member of a homogeneous set of objects, so that any two objects that differ in this characteristic may be differentiated from one another according to this characteristic, and that any two objects that are identical as regards this characteristic may be considered to be identical. Owing to methodology and computer development, it is possible to create projects with multivariate methods that include a large number of parameters to control establishment of clusters as shown by Momirovic at all. (1987.). Bonacin (2000).

Thus the set of values of some variables designating a set of objects is defined. By reasonably assuming that generally at least one permanent system of stable phenomena exists, the issue of defining a recognition is but a decomposition of a composite phenomena in its parts that can be described in particular clusters as presented by Bonacin and Carev (2002) or Momirovic at all (1987). Likewise, by assuming that generally these systems of phenomena, that is, the elements of the composite cvharacteristics contain the clusters that overlap in space, the issue of recognition identification apparently comes down to determining the existence and onset of a particular part of the composite, that is, of the subsegmented phenomena as shown by Bonacin and Carev (2002).

Assuming that it is possible to describe some objects and to collect the multivariate data in the space that extends over some variables that we are interested in, then the identification of any phenomena comes down to detecting those clusters that commence their dominant position through stable types of specific clusters which is methodologically proofed by Bonacin and Carev (2002) or Momirovic at all (1987). Many sets of objects are too complex to explore, and seemingly rarely allow too large a number of entities which the performance of a set of objects is followed. However, all recognitions characterised by a set of acquired parameter values allow such an approach. Lately, the number of such problems in many scientific areas is increasingly high, for example, computer simulations, in medicine and diagnostics when entities are continuously engaged in the analyses on specialised devices such as monitors or treadmills implying the analysis of ventilation-related issues, in real-time process monitoring, in telecontrolled analysis, in data analysis on the basis of different video and stimulation devices, etc. It is, therefore, possible to define such algorithms and such models of data synthesis that provide a reliable recognition identification in tehnical sciences, but also elsewhere as shown by Bonacin and Carev (2002). To illustrate the recognition identification for the purpose of this paper, the data about the development model of pseudo-objects in a finite two-dimensional space ranging from a completely empty space to the complex phenomena occurring in it were mostly generated and simulated on a computer. First of all, it was 9x9 area defined as a space where everything happens (there were several different models, eg. 7x7, 8x8, 10x10..., and all of them derivate same results). The simplest entity was white, empty surface raster of 9x9 points, explaining that there was nothing. Then the authors generate few hundred entities, and the computer, using random generator function, generates more entities in that space, with different structure, from simplest one point to more complex figures. Finally, the computer made a semi-random choice and choose finite 700 objects from that bulk. This number of 700 entities was not choosen accidentally, because that number allows any correlation, factor or taxon saturation etc., that is larger than 0.10 to be significant at probability level of 0.01.

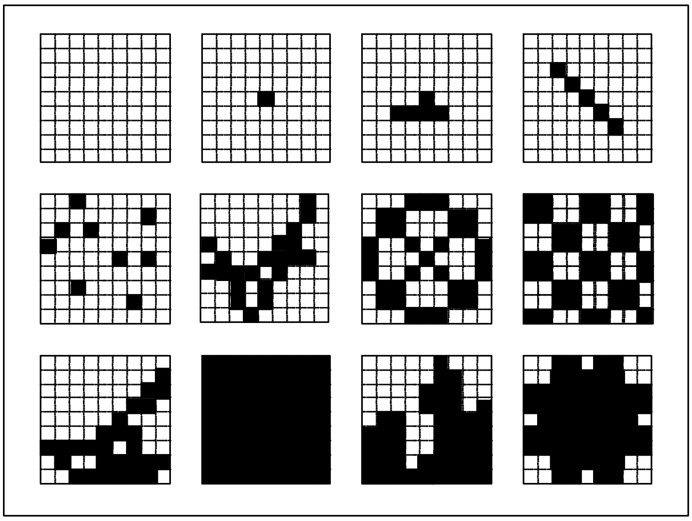


Figure 1. Some examples of primar entities

Thus the set of values of some variables designating a set of objects is defined. It was done several times with randomly choosen different sets of 700 entities, and the results were always the same. Acquisitional collection of data for 700 entities was simulated and monitored with a larger number of variables (64 in start) that was eventually reduced to 14 acquisitional variables and 4 arbitrary variables. This reduction was made by clasical factor model with oblique rotations defined by Momirovic at all (1987) and programed by Bonacin (2002), so only variables with significant saturations of any factor were included in further model. Those 14 variables were: number of points for information receiving (BRPR) number of points which can not receive direct information from outside area restricted by skeleton (XXXX), number of points in skeleton (BRSK), total number of points (BRTO), most distance free externe point (NSET), most distance free point in general (NSTO).

Then : maximal number of steps for information transmiting in worst case (IMXV), minimal number of steps for information transmiting in best case (IMNV), number of points for information emision (BREM), number of connections (BRSP), total number of lines (BRLU). number of points in “prison” (BRVR), total number of direct relations between points (BREL) and total number of free points arrounded (ZAPO). Arbitrary 4 variables were: simplicisity (JEDS), reproducibility (REPR), regularity (PRAV) and simetricity (SIME). Each of those four arbitrary variables were estimated by 3 independent judges, and final estimate result was generated by their common measure, by projecting their estimates on the first factor as common measuring subject generated by factor analysis of principal components foundated by Hotelling (1933) and programed by Bonacin (2002). It is very interested that several variables shows distribution that is diferrent than normal, but all mechanisms of higher level (taxons) shows absulote normal distribution. That fact was established by standard Kolmogorov-Smirnov testing like Momirovic (1987) proposed and programed by Bonacin (2002). To achieve an accurate identification, these 18 variable data were taxonomized according to the Momirovic’s (1987) model of polar taxons until the general and ultimate taxon was derived. The procedure first generate 6, then 3 taxons of higher level, then two. Finaly it was one global taxon derived. Taxonomic procedure was chosen because it most efficiently describes the objects (entities), and if we want to understand objects development and structuring it is obviously that we have to maintain the transformation of our data in object’s space, not in space of variables, that is frequently the case. *Polar taxons algorithm* : This algorithm is completely published in : Momirovic at all (1987), Bonacin and Carev (2000).

Results

Obviously, if initial objects data described by 18 variable shows the simplest space representation, then the general and ultimate taxon represents the final solution in the defined space. It is clear by intution, and is easy to proof that the final solution is something to which our objects (entities) are converging in defined space, acording with their characteristics described with variables of lower level. Owing to large number of entities, it is easy to proof that global representation is ensured and that it is almost irelevant if there were 700 or 7000 entities, which is firmly hold on by Central Limit Theorem. Model of polar taxons produces one bipolar characteristic for each taxon so the recognition of those characteristics is connected with: a) recognition of variables which define taxons in variable space (Table 1.), and b) recognition of tipical entities with maximal projections on extreme sides of taxon (Figure 2.).

	Tax1	Tax2	Tax3	Tax4	Tax5	Tax6
BRPR	**0.53**	*0.12*	*0.44*	*0.09*	*0.33*	*-0.38*
XXXX	**0.49**	*0.40*	*-0.42*	*-0.26*	*-0.22*	*0.12*
BRSK	**0.72**	*0.30*	*-0.15*	*0.13*	*-0.05*	*0.01*
BRTO	**0.66**	*0.41*	*-0.08*	*-0.10*	*0.30*	*0.11*
JEDS	**-0.93**	*0.35*	*0.05*	*0.06*	*0.04*	*0.15*
REPR	**-0.89**	*0.48*	*0.10*	*0.04*	*-0.04*	*0.11*
NSET	**-0.57**	*-0.56*	*-0.09*	*0.08*	*0.27*	*0.30*
NSTO	**-0.60**	*-0.52*	*-0.13*	*0.06*	*0.19*	*0.38*
PRAV	*-0.68*	**0.83**	*0.09*	*0.21*	*-0.07*	*-0.04*
SIME	*-0.47*	**0.89**	*0.12*	*0.28*	*0.00*	*-0.10*
IMXV	*0.36*	*0.04*	**0.84**	*-0.11*	*-0.19*	*0.39*
IMNV	*0.35*	*0.16*	**0.71**	*-0.16*	*-0.30*	*0.48*
BREM	*-0.03*	*-0.26*	**0.68**	*0.12*	*0.12*	*-0.44*
BRSP	*0.46*	*-0.01*	*-0.13*	**0.75**	*0.09*	*0.23*
BRLU	*0.51*	*0.00*	*-0.06*	**0.77**	*0.05*	*0.18*
BRVR	*0.12*	*0.38*	*-0.03*	*-0.40*	**0.74**	*0.15*
BREL	*0.46*	*0.39*	*-0.16*	*-0.13*	**0.55**	*0.17*
ZAPO	*0.30*	*0.19*	*-0.31*	*-0.14*	**-0.80**	*0.01*

Table 1. Oblique position of taxonomic dimensions

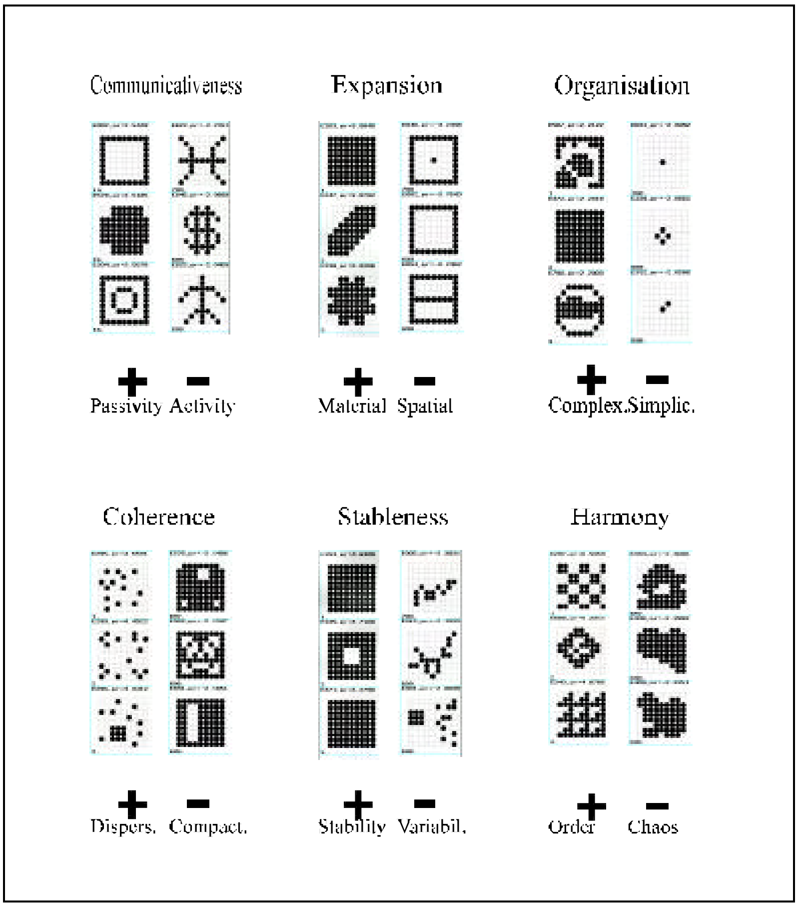


Figure 2. tipical entities with maximal projections on extreme sides of taxons

Discussion

Consequently, six easily interpretable taxons were obtained: 1. communicativeness (+passivity, -activity), 2. expansion (+material, -spatial), 3. level of organisation (+complexity, -simplicity), 4. coherence (+dispersion, -compactness), 5. stableness (+stability, -variability) and 6. harmony (+order, -chaos). Plus (+) and minus (-) sign represents the opposite sides of taxons. Entity abilities that stands at the begining of stimulus registration are exposed through : a) <u>Stimulus type recognition</u> (large width scale, specialization, discriminitivity), b) <u>Intensity recognition</u> (protoliminal – with no sensor reaction, subliminal – with no obvious sensor reaction but with cumulative changes, liminal - with clear registration and sensor changes, supraliminal – with serious senzor reaction, fatal – with sensor or entity destruction). c) <u>Frequency recognition</u> (rare but uniformed stimuli, rare but ununiformed, frequent but uniformed, frequent but ununiformed, combined). It is clear that we talk about degree of influence from the entity environment. For entities which beter apsorbe those stimuluses we can say that they stands at the higher level of internal structure organisation and that longer satisfy survival conditions. Simply the same conclusion is defined in sense of frequency, because entities which can better accomodate frequencies we can defined that they stand at higher level. They just better accumulate disturbancies from the environment.

<u>Simple sensors</u> : We can conclude that the entity containes a sensor if it can recognise larger boundaries of some distrubancies, different frequencies and intensities. This worth always and for all, no metter what is a concrete object. In the minimalistic sense, a sensor is simply receptor mechanism which is spetialised for reception more of less strictly defined disturbancies from the environment. We call it a receptor. It is more than clear that such receptor can not be defined once forewer, but is unconditionaly exposed to development because is constantly trying to absorb wide types of disturbancies. In that way becomes more and more complicated and organised in **stimulus recognition (analysis).**

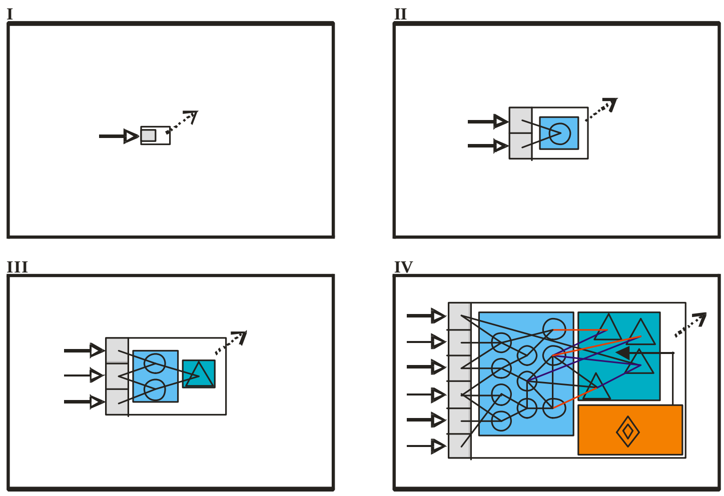
<u>Sensors in the wide sense</u> : Such sensor is not self-aimed, because those informations are to save somewhere in the entity, which means that entity have to develop transport. Finaly, with transported information it have to do something, because on the contrary that information is unnecessary. This is a chain : reception – transport – memorising – computing. In the wide sense, sensors represents information managing with specific goals. So, sensor includes more segments of organised entity with tasks of recognition environment phenomena and **developing of relations. (synthesis).** <u>Sensors in global sense</u> : If we suggest everything writen before it is clear that is possible to memorise only final ammount of primar information, so entity must recognise main rules of generalisation, categorisation, discrimination and globalisation, which are foundations of any phenomena recognition. So, from infinite variations, entity forms final, stable, minimal and finit ammount of rules which help him to determine all other phenomena. That is what we call **modeling.** <u>Rules</u> **:** After sensor forming, based on qualitative integrative models, entity generate rules which are invariant of further comprehense. That means the entity recognise rules of a nature that surroudes it. Based on it, entity manage with himself, trying to reorganise itself, and redefine all its models according to rules he comprehense (**selfregulation**). <u>Environment actions</u> : From this point (because the rules are determined) the entity develops actions into environment, trying to extend its rules to all other entities. If its rules are not persitent, he will be destroyed in some way. If the entity incorporate strong and truth rules, it will communicate with many other entities and develop cooperation, expanding its knowledges. This phase we call **expansion**. <u>Integration</u> : Oving to communication between entities and to forming new inter-entity relations final stage of development is making new entities, we call supraentites with characteristics of more entities included. This phenomena we call **harmony**, and is characterised with integration between more and more entities.

	PERSIS	REGULA	EDUCAB	DETERM	DEVELO	GLOBAL
BRPR	-0,09	**0,44**	0,32	0,33	**0,37**	0,49
XXXX	**0,78**	0,51	-0,34	**0,70**	-0,64	0,04
BRSK	**0,69**	0,49	0,10	**0,77**	-0,22	0,38
BRTO	**0,67**	**0,68**	0,10	**0,87**	-0,20	0,47
JEDS	-0,10	**-0,54**	-0,13	**-0,45**	-0,12	-0,40
REPR	-0,03	**-0,53**	-0,21	**-0,42**	-0,22	-0,45
NSET	**-0,51**	-0,45	0,25	**-0,53**	0,43	-0,07
NSTO	**-0,43**	**-0,50**	0,17	**-0,54**	0,32	-0,16
PRAV	**0,33**	-0,32	-0,13	-0,05	**-0,31**	-0,26
SIME	**0,43**	-0,16	-0,02	0,15	**-0,26**	-0,08
IMXV	-0,02	**-0,41**	-0,34	**-0,38**	-0,32	-0,49
IMNV	0,17	-0,41	**-0,48**	-0,30	**-0,53**	-0,59
BREM	**-0,77**	-0,19	0,20	-0,53	**0,55**	0,02
BRSP	**0,58**	0,01	**0,67**	**0,54**	0,27	0,57
BRLU	**0,56**	0,00	**0,66**	**0,53**	0,27	0,55
BRVR	0,25	**0,65**	0,08	**0,60**	0,01	0,43
BREL	**0,59**	**0,72**	0,22	**0,89**	-0,05	0,59
ZAPO	**0,51**	-0,02	**-0,60**	0,12	**-0,77**	-0,46
ORGANI	0,47	**0,58**	0,11	**0,69**	-0,09	0,42
STABLE	**0,78**	0,26	-0,21	**0,57**	-0,55	0,02
COHERE	**-0,50**	-0,47	-0,13	**-0,65**	0,10	-0,38
HARMON	0,26	-0,35	**0,78**	0,15	**0,48**	0,44
EXPANS	-0,12	0,54	**0,65**	0,47	**0,66**	0,80
COMMUN	**0,53**	-0,44	-0,15	-0,02	**-0,45**	-0,33
PERSIS	1,00	0,12	-0,01	**0,68**	-0,51	0,12
REGULA	0,12	1,00	0,09	**0,76**	0,12	0,62
EDUCAB	-0,01	0,09	1,00	0,35	**0,86**	0,84
DETERM	0,68	0,76	0,35	1,00	0,02	**0,71**
DEVELO	-0,51	0,12	0,86	0,02	1,00	**0,71**
GLOBAL	0,12	0,62	0,64	0,71	0,71	1,00

Table 2. Taxonomic mechanisms of higher level (inter-correlations)

The next step of development (and Global Comprehensive Theory too) is recognising a mechanisms of higher level which was done with the same methodology. Thus, this 6 mechanisms were obatined in first step, and now we put them into initial position, and then provide Polar taxon algorithm again.

Now, we derive 3 taxons with furthure characteristics : Persistency (+ Endurance, - Sensitivity), Educability (+ Systematicity, - Superficiality) and Regulation (+ Accuracy, - Elementarity), as shown in table 2.. All entities were projected at those taxons. The next step (in the same way) produces 2 taxons : Development (+ Stagnation, - Advancement) and Determinism (+ Dezintegration, - Integration) as shown in table 2. The final step prodeces one global taxon – Comprehence, as representative taxon for that space with bipolar characteristic of Global comprehence (+) and Partial comprehence (-) as shown in table 2. Finaly, we defined a process of simulatneous activities that realy exist in defined space, but always with the aim of new entities forming. It is concluded that there exist constructive development process in according with logic expressed in final taxon, because the entities at the top of that taxon are most complex, most invariant on influences, and with characteristic that easy establish relations with other entities. At the bottom of that taxon, we can recognise entities that are realy fall to pieces, so is very hard to look them as entities at all. Founded on concept Sensor-Relation-Model-Rule-Acting-Harmony, it is established completely new methodology, and completely new light on world development. Of course, that methodology is easy applicable in any scientific disciplines, never less it is Kinesiology, Engeneering, Education, Informatics, Medicine, Atomic physics, etc. Concrete applications will continue in the future.



Slika 3. Shema spoznavanja entiteta u prostoru njegove egzistencije

Legenda:

- Prostor
- Entitet
- Senzor
- Relacija
- Model
- Pravilo
- Razina senzora
- Razina relacija
- Razina modela
- Razina pravila
- Veza izmedu senzora i relacije
- Hijearhijska veza 1. reda izmedu relacije i modela
- Hijearhijska veza 2. reda izmedu relacije i modela
- Hijearhijska veza n. reda izmedu relacije i modela
- Senzorski podražaj entiteta
- Popratna pojava spoznavanja
- Reprogramiranje modela temeljem pravila
- I-IV Karakteristicne faze razvoja entiteta

References

Bonacin, D. and Z. Carev (2002). *Process identification.* Kinesiology – New perspectives, Opatija - Croatia.

Bonacin, D. (2002). *A private library of algorithms and programs with explanation.* K.Sucurac - Croatia.

Carev, Z. (2000). *Opce zakonitosti procesa kao pojma i zakonitosti dinamike. (Global process regularities and regularities of dinamics).* Faculty of mechanical engeneering and naval architecture, Zagreb.

Momirovic , K, F. Prot, D. Dugic , Z. Knezovic , K. Bosnar, N. Erjavec, M. Gredelj, J. Kern, V. Dobric and J. Radakovic (1987). *Metode, algoritmi i programi za analizu kvantitativnih i kvalitativnih promjena (Methods, algorithms and programs for analysis of quantitative and qualitative changes).* Institut for kineziology FFK University of Zagreb.