

The System of Informational Consciousness

(Presenting New Philosophy, Methodology, Formalisation and
Advice for Implementation)



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Ljubljana, January 19, 2008

Preface

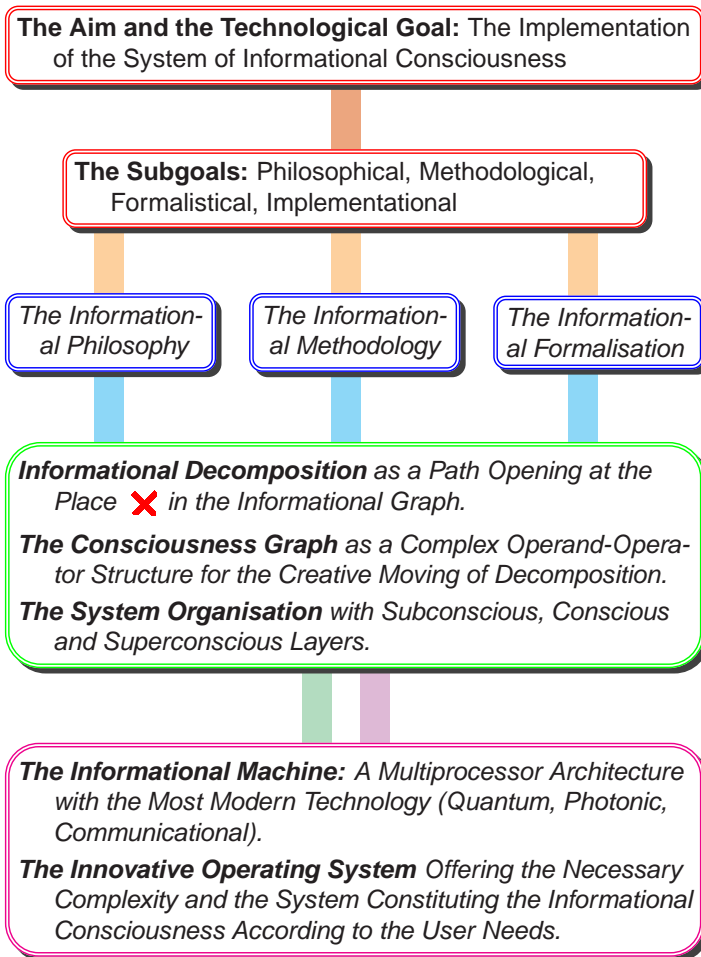
“To be concise and understandable” is the motto of this study describing a complex concept on informational consciousness. It is meant as a guide for implementers in the field of informational philosophy, methodology, formalization and technological realisation – and certainly in modelling conscious systems with the informational means. Fig. 1 sketches this approach.

The author believes that the methodology of the presented approach is being ripen to such a critical extent where the project in different ways and on different places can start. The idea is to make informational consciousness a shareware project staying open for diverse research and implementation teams over the globe, as education and research projects at universities and private organizations, supported financially by public and private foundations.

The knowledge revealed in this study is free of charge, however the source(s) of authors publications from which the concepts are imagined or taken should be quoted in a reasonable form. That which must be studied and researched intensively in the future is the structure and organisation of concrete decomposition procedures which in fact remain “creative” means in programming with the creative interior and exterior power. In this spirit, creativity must be more precisely defined philosophically, methodologically, experientially and at last implementationally. It must stay clear that the creativity is nothing more than a property of consciousness and, especially, informational consciousness.

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Figure 1: *The intentional structure of the essay aimed to the understanding and the implementation of the informational consciousness and its system, through the informational philosophy, methodology and strict formalization, realised by the informational machine.*

Contents

1	The Introduction to the Concept of Informational Consciousness	1
1.1	The Informational Motivation	1
1.2	The Informational Consciousness	2
1.3	The Basic Informational Constituents	2
1.3.1	The Informational Operands	2
1.3.2	The Informational Operators	2
1.3.3	The Informational Parenthesis Pairs	2
1.4	The Outline of the Informational Consciousness Concept	5
2	The Informational Symbolism and the Informational Formalism	6
2.1	The Informational Symbolism and the Informational Formalism as the Means Leading to the Implementation of the IC	6
2.2	The Informational Symbolism	6
2.3	The Basic Formalistical Constituents	6
2.3.1	The Informational Operands	7
2.3.2	The Informational Operators	7
2.3.3	The Parenthesis Pairs	7
2.4	The Informational Formalism	7
2.4.1	The Informational Axioms	7
2.4.2	The Informational Formula	10
2.4.3	The Informational Formula Scheme	11
2.4.4	The Informational Formula Gestalt	11
2.4.5	The Informational Formula Graph	12
2.4.6	The Informational Formula Frames	12
2.4.7	The System of Informational Formulas	12
2.4.8	The System of Informational Formula Schemes	12
2.4.9	The Informon	12
2.4.10	The Entropon	12
2.4.11	The Phrases of Informational Operands and Operators	12
2.4.12	The Informational Thesaurus	12
2.4.13	The Informational Space	12
2.4.14	The Alloy of Informon Graphs	12
2.4.15	The Informational Decomposition	12
2.4.16	The System of Informational Consciousness	12
3	The Recursiveness of the Informational Spaces	13
3.1	The Recursive Definition of the Informational Space	13
3.2	The Higher Ranks of Informons, Entropons and Informational Spaces	15

4	Models of the Informational Consciousness	17
4.1	The Models of the IC Using the Hierarchy of the Consciousness Layers	17
4.2	The Model of the IC Using a Simple Alternatively Perplexed State of the Consciousness Layers	19
4.3	The Model of the IC Presenting Simultaneously the Hierarchy, Asymmetry and Perplexedness of the Consciousness Layers	19
4.4	The Models of the IC Using the Sphere Segments as the Consciousness Layers	21
4.5	Other Possible Models	21
5	The Procedure of the Informational Decomposition	22
5.1	Informational Creativity	23
	<i>References</i>	<i>24</i>

List of Figures

1	<i>The intentional structure of the essay aimed to the understanding and the implementation of the informational consciousness and its system, through the informational philosophy, methodology and strict formalization, realised by the informational machine.</i>	iii
2	<i>The outline of the system bringing together the philosophy, the methodology, the formalization and the implementation possibilities of the IC.</i>	4
3	<i>The outline of the informational formalism, its symbolic structure from the basic formalism to the most complex one, following the system structure of implementation represented in Fig. 2. The correspondence of entites in Fig. 2 and symbols in this figure is equally the same, so the direct comparision between Fig. 2 and this figure is being tranparent.</i>	8
4	<i>The geometrical interpretation of the abstract iterative model of informational consciosness by layers of informational spaces and entropons, according to Post. (28) and Post. (29), showing the reasonable (realisable) structure and organisation of the artificial (technological, informational) and also natural (biological, phenom-enal) consciousness in the direction of the new and different informational and cognitive research.</i>	18
5	<i>The white and the slightly shadowed areas represent the set differences of layers in the subconscious domain of the ICS, discribed in Fig. 4. A set difference makes explicit the part of operand and operator phrases used in the emerged supercon-scious informon and then added to the corresponding subconscious set phrases. Within this superconscious informon new operand and operator phrases come into the context of its meaning from an exterior phrase source or are just generated inter-iorly (innovatively) by the decomposition procedure. The higher the informon (the meaning), the deeper the entropon (the phrases belonging to the meaning).</i>	20
6	<i>The diagram shows the complexity of the layers constituting the system of infor-mational consciousness with hierarchical, assymetric and layer-perplexed (trans-parently overlaped) structure and organization of the system, conceptualized by the iterative induction of informational spaces and entropons. The sub- and super-conscious layers actually enclose the conscious layer and enable that this sort of components can appear in the actual state of consciousness.</i>	21

List of Tables

1 The Introduction to the Concept of Informational Consciousness

The modifier *informational* is obvious in the context of the informational and the conscious. It touches phenomena as informational entities (henceforward: IE) existing as concepts in the minds of the individual people and the future informational machines.

1.1 The Informational Motivation

The experience the science likes to express more than anything else is understanding of consciousness as a complex undertaking of various scientific and henceforth technological disciplines. The study of the consciousness becomes a scientific ideal and the highest possible challenge: the professional research of the today and the future. Simultaneously the technology wants to design more than anything else the machine with the abilities of consciousness in the form of a spiritual machine and the minds of sociable, working and production robots. Attitudes and situations of today and the future put the philosophy and the science of consciousness to the frontier position in research and engineering.

Consciousness is a broad field of disciplines and doctrines facing problems from various points of view, aim and understanding. The informational view of consciousness dominates in this study philosophically, methodologically, formalistically and implementationally together with the highly attentional view to the conscious domain. The formalisation of informational and conscious phenomena was quite at the beginning of author's study the main challenge of conceptual and expressional possibilities by specific also new mathematical symbolism. The basic quest emerged at that time: will it be at all possible to express symbolically sufficiently accurate situations dealing with the emerging

of information, creativity in the domain of consciousness, mastering symbolically the complexity of phenomena etc.

The informational motivation moves from the conceptual problems in this study to the various fields of theory dealing with the problems of human and animal consciousness, since the informational is becoming and can become a new and differently structured and organised tool of research, philosophy, methodology and possibilities of formal expression. It can offer a new view, a different research approach and a changed understanding of scientific and technological tasks dealing with consciousness phenomena in the natural and the artificial.

1.2 The Informational Consciousness

Informational Consciousness (henceforward: IC) is a theory, methodology, formalisation and implementation design of consciousness system which touches all aspects of consciousness and unifies them through a very general claim:

The IC Postulate: IC is a network of informational spaces. (1)

This claim (1) is unique and can be described as a commonplace of informational approaches to the phenomena of consciousness. The concept of IC has not predecessors except Železnikar ([1]–[8]) and roots in the informational nature of phenomena, in the philosophy and new formalism of meaningful information. Any system of interconnected entities is a network and the consciousness system is a network of informational spaces—a view that every modern philosopher, cognitivist, physicist, mathematician, psychologist, linguist, computer scientist, sociologist and informatician could accept.

1.3 The Basic Informational Constituents

1.3.1 The Informational Operands

1.3.2 The Informational Operators

1.3.3 The Informational Parenthesis Pairs

Informational space is the concept expressed by meaning and this is, within a language, a system of entities which define the meaning of something by explanation or interpretation through sentences, speech, pictures, for instance. *Someting* is the object or saying formalistically a *named operand* within the

formalistic theory of consciousness. The modifier *named* means that it has a clearly expressed initial meaning given by a noun or noun phrase in a language or in another way (picture, face, sound, feel, etc.). Naming of operands has its central subscription language functioning as universal language in the formalized theory of the informational and the conscious; thus formalized English subscription is accepted, e.g., in the form

$$\varepsilon_{\text{noun_phrase_subscript_in_English}} \tag{2}$$

ε symbolises the formalistic character of the operand and the subscript its meaning in the chosen language. English is preferred as the most propagated language (the most proper new-age Latin) for which dictionaries and other language tools exist in all dominant cultures of the world and translations can be easily performed.

Besides the operand another basic entity is introduced called binary informational operator (henceforward: operator). As usually operator stands between two operands, the simple and the structured ones. The modifier *structured* applies to informational formulas where a formula itself is a structured operand and so might be subformulas. Formula systems are another kind of structured operands and so are formula schemes and scheme systems. The most basic form of operator carries the implicit meaning of the verb *inform* viewed from the left side of operator and *be informed* viewed from the right side of operator. Three types of such operators can be distinguished:

$$\models, \models_{\text{verb_phrase_subscript_in_English}}, \models_1 \circ \models_2. \tag{3}$$

The third form represents operator composition where \circ is the composition operator in the domain of operators only.

The last constituent needed in respect to the binary operators and operands is parenthesis pair, denoted as ‘(’ and ‘)’, by which in lengthy expressions of operands and operators the domain of each operator can be clearly determined. This is presented by a sample formula, e.g.,

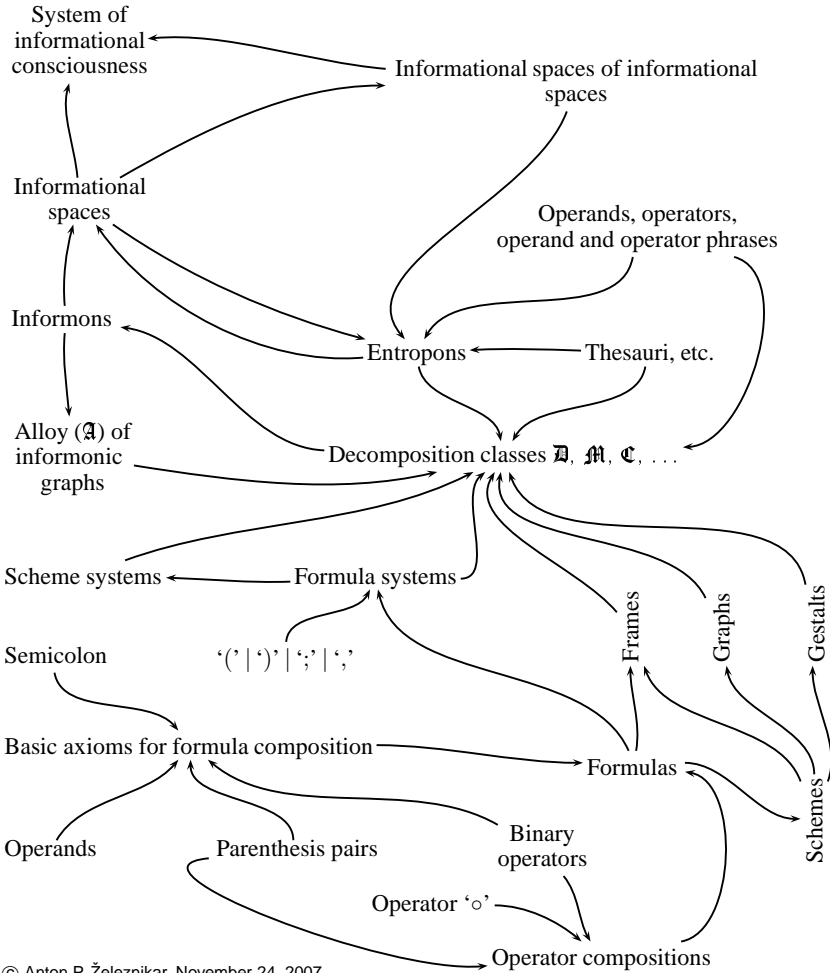
$$(((a \models b) \models c) \models (d \models e)) \models ((f \models g) \models (h \models i)). \tag{4}$$

Operator \models functions as an operator joker and can be meaningfully subscribed dependently from the right and left operand, that is, expressed by operator composition as

$$a \models_a \circ \models_b b. \tag{5}$$

In language, the composition $\models_a \circ \models_b$ can be replaced by a phrase operator

between operands corresponding to a single verb in the use of language. In this case the operators \models_a and \models_b are equal and $(\models_a \circ \models_b) \equiv (\models)$ where ‘ \equiv ’ reads ‘means’.



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Figure 2: The outline of the system bringing together the philosophy, the methodology, the formalization and the implementation possibilities of the IC.

1.4 The Outline of the Informational Consciousness Concept

The way to the concept as graphically presented in Fig. 2 was lengthy and dilemmatic. Although it may sound unbelievably, at the beginning and through the research the main idea and intention were the art of efficient and esthetic formalization. For instance the choose and author's typographical construction of symbols, graphs and presentation forms by the use of \LaTeX and PsTricks delivered an exiting theoretical, formalistic- and picture-esthetical and cognitive experience. Some of this approaches will be demonstrated along the wide road of this essay.

The frame graph in Fig. 2 shows at least three hierarchical levels of design. At the bottom of the graph everything is referenced which constitutes the expression of informational formula and formula system.

2 The Informational Symbolism and the Informational Formalism

2.1 The Informational Symbolism and the Informational Formalism as the Means Leading to the Implementation of the IC

2.2 The Informational Symbolism

The symbolism brings to the surface various hidden properties and relations, does explicitly sharpen them and, to all of that, contributes to the clarity and transparency of the formalized concepts. A symbol concentrates the meaning it represents through a carefully composition of graphical elements, forms, fonts and other visual and geometrical possibilities. For instance, symbol $\varphi_{\triangleright}^{\circ\parallel}$, defines a complex formalized entity being a parallel system (\parallel) of $i = 1, 2, \dots$ circular (\circ) formulas $\varphi_{i\triangleright}^{\circ}$, determined by the type classifier \triangleright as the serial (\rightarrow), reverse serial (\leftarrow), biserial (\rightleftarrows), and split biserial ($(\rightarrow, \leftarrow)$) formulas. The symbol $\varphi_{\triangleright}^{\circ\parallel}$, defines a complex formalized entity being a parallel system (\parallel) of $i = 1, 2, \dots$ circular (\circ) puts this conglomerate to the step of the informon as the meaning represented by the system $\varphi_{\triangleright}^{\circ\parallel}$, defines a complex formalized entity being a parallel system (\parallel) of $i = 1, 2, \dots$ circular (\circ) formulas. The system of informational symbols belongs to the so-called formalistic informational language denoted by \mathfrak{I} .

2.3 The Basic Formalistical Constituents

The first steps to the possible formalism have been imagined on the very beginning of the informational philosophy development, that is, in 1987 [1]. The developed formalism proceeded from the initial and the later philosophy

with symbolism close and further revealed to those in the theory of algorithms (Železnikar 1967).

2.3.1 The Informational Operands

like

$$\alpha, \beta, \dots, \Delta, \Gamma, \dots, \mathbf{a}, \mathbf{b}, \dots, \quad (6)$$

with subscripts and superscripts, etc. The symbol \mathfrak{z} was chosen to denote the named operand $c_{\text{consciousness}}$ when the informational symbolism became involved to the system of consciousness. A further step towards the symbol complexity was made by the introduction of the concepts called the informon and the entropion, where the informon $\underline{\alpha}$ denotes the meaning (a formula system) defining the named operand α and the entropion $\overline{\alpha}$ defines a set of the operands and operators occurring in the informon $\underline{\alpha}$. The most substantial step towards the complexity of the consciousness system was introduced by the concept of the informational space of a named operand α , denoted by $(\underline{\alpha}; \overline{\alpha})$, causing a revolution in the modelling of the structure representing the consciousness system.

2.3.2 The Informational Operators

The basic informational operators, for instance,

$$\models, \models, \vdash, \vdash, \not\models, \not\models, \not\vdash, \not\vdash, =\models, =\models, \neg, \neg, \neq, \neq, \neq, \neq, \neq, \neq, \quad (7)$$

have been introduced together with inconvenient operand symbols.

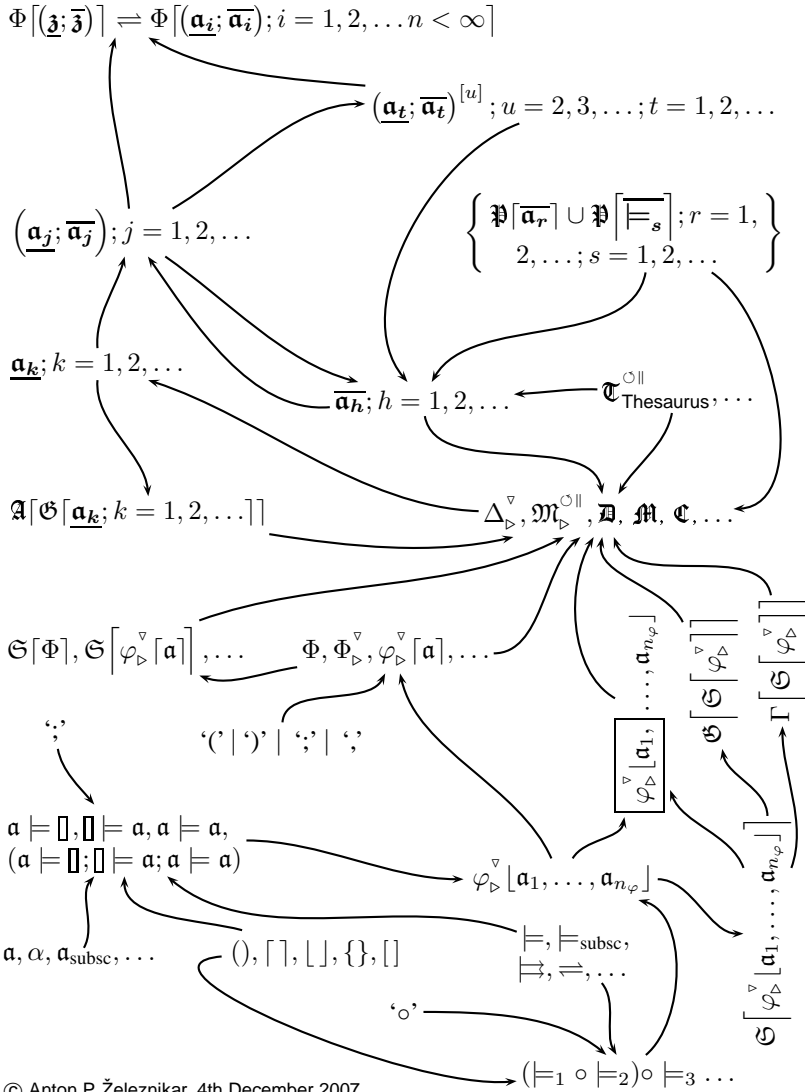
2.3.3 The Parenthesis Pairs

2.4 The Informational Formalism

The informational formalism follows the concepts presented as the structure of informational philosophy and methodology in Fig. 2.

2.4.1 The Informational Axioms

In the initial state of a philosophy some basic rules prevail which give the emerging philosophy a specific intention and also the goal of its aim and purpose. These rules must deliver general acceptance for a wide range of



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Figure 3: The outline of the informational formalism, its symbolic structure from the basic formalism to the most complex one, following the system structure of implementation represented in Fig. 2. The correspondence of entites in Fig. 2 and symbols in this figure is equally the same, so the direct comparison between Fig. 2 and this figure is being transparent.

scientific and research disciplines, or by other words, must be evident also from the view of the everyday experience of a being using consciousness. Although the rules may appear pure informational their background shows evident abilities of the conscious background coming fore as phenomenal properties:

The Basic Informational Postulate: An informational entity informs and is informed by itself and other informational entites. (8)

The physicalist approach to informational postulates would be:

The Basic Physical Postulate: A physical entity impacts and is impacted physically by itself and other physical entites. (9)

These postulates root in informational and physical change or in something called the emergence and vanishing of particular entites and simultaneously unite informational and physical claim as an interdependent phenomenalism also by the formalistic expression. This interdependence will be presented in the following order:

The Formalised Basic Postulates: (10)

The Formalism	The Informationalism	The Physicalism
---------------	----------------------	-----------------

Formalistically and interpretationally the informational postulate can be devided to four particular claims bringing fore the nature of the informational in a conscious situation. Denoting the informational and the physical environment symbolically by '[]' and formula separation (parallelism) symbol by ';' there is:

The Formalistic, the Informational and the Physical Externalism: (11)

$$a \models [] \quad a \text{ informs } [] . \quad a \text{ impacts } [] \text{ physically.}$$

The Formalistic, the Informational and the Physical Internalism: (12)

$$[] \models a \quad a \text{ is informed by } [] . \quad a \text{ is impacted by } [] \text{ physically.}$$

The Formalistic, the Informational and the Physical Metaphysicalism: (13)

$$a \models a \quad a \text{ informs and is informed by itself.} \quad a \text{ impacts and is impacted by itself physically.}$$

The Formalistic, the Informational and the Physical Phenomenalism:

$$\left(\begin{array}{l} \alpha \models \square; \\ \square \models \alpha; \\ \alpha \models \alpha \end{array} \right) \quad \begin{array}{l} \alpha \text{ informs and is in-} \\ \text{formed by } \square \text{ and it-} \\ \text{self.} \end{array} \quad \begin{array}{l} \alpha \text{ impacts and is impacted by} \\ \square \text{ and itself physically.} \end{array} \quad (14)$$

The formalistical axioms serve as the formula syntax where operands α and \square are of the most general operand type like independent variables in mathematics. The binary informational operator \models is of the most general operator type not concretely defined yet, a kind of independent operator variable not known in this sense in mathematics where operators are usually well-defined. The semantic content of the basic axioms comes to the foreground especially in informational case. The axiom (8.2) for instance says that operand α is informed by something \square and thus sensitive to the informing of something possessing a kind of understanding, meaning filtering, comprehension etc. The same could be said for cases of informational methaphysicalism (8.3) and phenomenism (8.4). The informational axioms act as implicit conscious rules which determine the nature of operand entities.

In case of the physical axioms, for instance in the domain of quantum physics, quantum particles behave influentially interactive in the one and the other direction. They impact and are impacted by the fact (or imagination) of quantum gravitation and through other possible quantum phenomena. This doesn't mean in any sense that the physics takes over the initiative of how the conscious system should be scientifically modelled. On contrary, other scientific disciplines are called to represent the view of seeing the consciousness problem within their own fields of research and use the developed informational philosophy, methodology and formalisation to revive the old models by the new formalism and sight.

2.4.2 The Informational Formula

The initial idea was clearly dedicated to the problem of formula expression, introducing the very general notation in the form:

$$\text{The Implicit Formula Expression: } \varphi_{\triangleright}^{\nabla} [\alpha_1, \alpha_2, \dots, \alpha_{n_\varphi}]. \quad (15)$$

The symbols ∇ and \triangleright specify the formula type (circular, serial, reverse serial, biserial and split biserial, respectively), the operands $\alpha_1, \alpha_2, \dots, \alpha_{n_\varphi}$ are the formula variables, however operators remain completely hidden within this notation. It is understood that the formula notation (9) represents the precise

sequence of operands, operators and parenthesis pairs, like for instance:

$$\text{The Explicit Formula Expression: } (\dots(\alpha_1 \models \alpha_2) \models \dots) \models \alpha_{n_\varphi}. \quad (16)$$

The parenthesis pairs can be grouped binarily in different ways along the formula sequence. Considering the possible setting of the parenthesis pairs, the implicit form can be numbered and denoted as

$$\varphi_{i\triangleright}^\nabla [\alpha_1, \alpha_2, \dots, \alpha_{n_\varphi}] \text{ where } i = 1, 2, \dots, \frac{1}{n_\varphi} \binom{2(n_\varphi-1)}{n_\varphi-1}. \quad (17)$$

It will be shown how the gestalt of a formula scheme considers the factor (number of differently parenthesized formulas) $\frac{1}{n_\varphi} \binom{2(n_\varphi-1)}{n_\varphi-1}$. The importance of strict parenthesizing is in the precise meaning determination of a formula excluding ambiguity for instance in language, vision, audio and other kinds of mind and sensory information.

2.4.3 The Informational Formula Scheme

2.4.4 The Informational Formula Gestalt

Let the denotations $\nabla \in \{\lambda, \cup\}$ and $\triangleright \in \{\rightarrow, \leftarrow, \rightleftarrows, (\rightarrow, \leftarrow)\}$ be used for

$$\varphi_{\triangleright}^\nabla [\mathbf{a}_1, \mathbf{a}_2, \dots, \mathbf{a}_{n_\varphi}] \in \Gamma \left[\varphi_{\triangleright}^\nabla [\mathbf{a}_1, \mathbf{a}_2, \dots, \mathbf{a}_{n_\varphi}] \right]. \quad (18)$$

The formula $\varphi_{\triangleright}^\nabla [\mathbf{a}_1, \mathbf{a}_2, \dots, \mathbf{a}_{n_\varphi}]$ represents one of $\frac{1}{n_\varphi} \binom{2(n_\varphi-1)}{n_\varphi-1}$ possible formulas of the length $n_\varphi - 1$. Formulas belonging to the gestalt are only differently parenthesised. Each formula has its own unfolding (explicit expression with parenthesis pairs) at the same operand sequence $\mathbf{a}_1, \mathbf{a}_2, \dots, \mathbf{a}_{n_\varphi}$ and the same operators \models between the free and the parenthesized operands. This is the reason why it is suitable to represent a formula with its scheme, that is,

$$\mathfrak{S} \left[\varphi_{\triangleright}^\nabla [\mathbf{a}_1, \mathbf{a}_2, \dots, \mathbf{a}_{n_\varphi}] \right] \rightleftharpoons (\mathbf{a}_1 \models \mathbf{a}_2 \models \dots \models \mathbf{a}_{n_\varphi}). \quad (19)$$

- 2.4.5 The Informational Formula Graph**
- 2.4.6 The Informational Formula Frames**
- 2.4.7 The System of Informational Formulas**
- 2.4.8 The System of Informational Formula Schemes**
- 2.4.9 The Informon**
- 2.4.10 The Entropon**
- 2.4.11 The Phrases of Informational Operands and Operators**
- 2.4.12 The Informational Thesaurus**
- 2.4.13 The Informational Space**
- 2.4.14 The Alloy of Informon Graphs**
- 2.4.15 The Informational Decomposition**
- 2.4.16 The System of Informational Consciousness**

3 The Recursiveness of the Informational Spaces

3.1 The Recursive Definition of the Informational Space

Informational Space (henceforward: IS) is a new concept uniting the conscious meaning of an operand and the corresponding subconscious background. The general verbal definition is:

The IS Definition: The IS is a system of definitions declaring the meaning of an operand in the conscious domain by formulas, called the informon, together with the corresponding subconscious domain consisting of the operand and operator phrases, called entropion. (20)

The symbolic denotation of an informon belonging to the named operand \mathbf{a} is $\underline{\mathbf{a}}$ and of the corresponding entropion $\overline{\mathbf{a}}$. This kind of denotation improves the transparency of the informons and entropions describing the lengthy formula and formula system expressions. For example:

$$(\underline{\mathbf{a}} \models \underline{\mathbf{b}}) \models \underline{\mathbf{c}} \text{ and } (\overline{\mathbf{a}} \models \overline{\mathbf{b}}) \models \overline{\mathbf{c}} \text{ or } \underline{\Phi}[\underline{\mathbf{z}}] \text{ and } \overline{\Phi}[\overline{\mathbf{z}}]. \quad (21)$$

In such a way enormously lengthy expressions can be broken, parenthesized and made to informons and entropions if necessary. This can happen in cases dealing with informational spaces of informational spaces or any other formalized configuration.

The informational space is a system of two subentities, the system of formulas representing the meaning of the named operand \mathbf{a} and the set of the operand and operator phrases figuring in the informon formulas. The general formalistic definition is:

$$\text{The Formalistic Definition of the IS: } (\underline{\mathbf{a}}; \overline{\mathbf{a}}). \quad (22)$$

The concept of the formula system is in any respect aimed (solely) to the constitution of the informon. This fact proceeds from the operand decomposition which is intended for the production of operand meaning by a sequence of the produced formulas. A formula system is expressed in an implicit or explicit form. While the implicit form is highly symbolic, the explicit form is a list of formulas informing in parallel (simultaneously). The semicolon ‘;’ is always a symbol of the parallel informing of entities.

It happens something unexpected when one puts a harmless question what the IS of the same IS could be. Here, the formalistic view gets its immediate answer:

$$\text{The IS of the IS: } (\underline{\mathbf{a}}; \overline{\mathbf{a}})[(\underline{\mathbf{a}}; \overline{\mathbf{a}})] \Leftrightarrow \left((\underline{\mathbf{a}}; \overline{\mathbf{a}}); \overline{(\underline{\mathbf{a}}; \overline{\mathbf{a}})} \right). \quad (23)$$

This IS has the recursive Rank 2 (henceforward: rank), denoted by $(\underline{\mathbf{a}}; \overline{\mathbf{a}})^{[2]}$, and is in respect to operand \mathbf{a} a pure IS. The braces ‘[’ and ‘]’ cover a wide range of interpretation possibilities, in this case such as chosen in (15). Another, more general question to this one is what the IS of the mixed structure of the form $(\underline{\mathbf{a}}; \overline{\mathbf{b}})$ could denote. Evidently to the character of the IS, the informon $\underline{\mathbf{a}}$ uses the same operand and operator phrases as does the informon $\overline{\mathbf{b}}$. This could mean that there is a closer meaning relation between them. The difference between the informons $\underline{\mathbf{a}}$ and $\overline{\mathbf{b}}$ is then solely in the differently structured formulas in the formula systems $\underline{\mathbf{a}}$ and $\overline{\mathbf{b}}$. an(other) IS could be. Formalistically there is one of the possible answers:

$$\text{The IS of the another IS: } (\underline{\mathbf{a}}; \overline{\mathbf{a}})[(\underline{\mathbf{b}}; \overline{\mathbf{b}})] \Leftrightarrow \left((\underline{\mathbf{a}}; \overline{\mathbf{b}}); \overline{(\underline{\mathbf{a}}; \overline{\mathbf{b}})} \right) \quad (24)$$

as a uniformly mixed case of the IS. Here certain meaning relations are possible:

$$\begin{aligned} (\underline{\mathbf{a}}; \overline{\mathbf{b}})[(\underline{\mathbf{a}}; \overline{\mathbf{b}})] &\Leftrightarrow \left((\underline{\mathbf{a}}; \overline{\mathbf{b}}); \overline{(\underline{\mathbf{a}}; \overline{\mathbf{b}})} \right), \\ (\underline{\mathbf{a}}; \overline{\mathbf{a}})[(\underline{\mathbf{b}}; \overline{\mathbf{b}})] &\Leftrightarrow (\underline{\mathbf{a}}; \overline{\mathbf{b}})[(\underline{\mathbf{a}}; \overline{\mathbf{b}})]. \end{aligned} \quad (25)$$

The operand and operator phrases pertaining to the operand σ in the subconscious domain are denoted in general by $\mathfrak{P}[\sigma]$ and $\mathfrak{P}\left[\overline{\overline{\sigma}}\right]$, respectively. They constitute the entropion $\overline{\sigma}$ in the form of a set:

$$\text{The Entropion Structure: } \overline{\sigma} \Leftrightarrow \left\{ \mathfrak{P}[\sigma] \cup \mathfrak{P}\left[\overline{\overline{\sigma}}\right] \right\}. \quad (26)$$

According to (14), the detailed expression is:

$$\text{The IS Structure: } (\underline{\mathbf{a}}; \overline{\mathbf{a}}) \Rightarrow \left(\left(\begin{array}{c} \varphi_1[\mathbf{a}]; \\ \varphi_2[\mathbf{a}]; \\ \dots; \\ \varphi_{n_\Phi}[\mathbf{a}] \end{array} \right); \left\{ \mathfrak{P}[\overline{\mathbf{a}}] \cup \mathfrak{P}[\overline{\overline{\mathbf{a}}}] \right\} \right). \quad (27)$$

In the informon formula system $\underline{\mathbf{a}}$, the formulas $\varphi_1[\mathbf{a}], \varphi_2[\mathbf{a}], \dots, \varphi_{n_\Phi}[\mathbf{a}]$ concern operand \mathbf{a} in such or another way, may be also transitively, that is via the common formula operands with a formula $\varphi_i[\mathbf{a}]$ being dependent directly on \mathbf{a} , expressed implicitly as $\varphi_i[\dots, \mathbf{a}, \dots]$.

3.2 The Higher Ranks of Informons, Entropions and Informational Spaces

The higher ranks of informons, entropions and informational spaces can be presented in a pure recursive way, outlining the layered structure of the consciousness system to an arbitrary height and to an arbitrary depth. The recursive situation is presented by the following table:

The Iterative Expressions Concerning the Informational Space:

Rank	Informon	Entropon	Informational Space	
0	$\underline{\alpha}^{[0]} \Rightarrow \alpha$	$\overline{\alpha}^{[0]} \Rightarrow \alpha$	$(\underline{\alpha}; \overline{\alpha})^{[0]} \Rightarrow (\underline{\alpha}^{[0]}; \overline{\alpha}^{[0]})$	(28)
1	$\underline{\alpha}^{[1]} \Rightarrow \underline{\alpha}$	$\overline{\alpha}^{[1]} \Rightarrow \overline{\alpha}$	$(\underline{\alpha}; \overline{\alpha})^{[1]} \Rightarrow (\underline{\alpha}^{[1]}; \overline{\alpha}^{[1]})$	
2	$\underline{\alpha}^{[2]} \Rightarrow (\underline{\alpha}; \overline{\alpha})^{[1]}$	$\overline{\alpha}^{[2]} \Rightarrow (\overline{\alpha}; \overline{\alpha}^{[1]})$	$(\underline{\alpha}; \overline{\alpha})^{[2]} \Rightarrow (\underline{\alpha}^{[2]}; \overline{\alpha}^{[2]})$	
⋮	⋮	⋮	⋮	
i	$\underline{\alpha}^{[i]} \Rightarrow (\underline{\alpha}; \overline{\alpha})^{[i-1]}$	$\overline{\alpha}^{[i]} \Rightarrow (\overline{\alpha}; \overline{\alpha}^{[i-1]})$	$(\underline{\alpha}; \overline{\alpha})^{[i]} \Rightarrow (\underline{\alpha}^{[i]}; \overline{\alpha}^{[i]})$	

Rank 0 is the very initial situation when the operand α appears as a just now named operand, for instance, as an exterior impulse coming from the system environment. There is just a virtual meaning for α yet in the system, that is, the informon $\underline{\alpha}^{[0]} \Rightarrow \alpha$, and as such it is put (memorised) in the subconscious domain as a zero-ranked entropon $\overline{\alpha}^{[0]} \Rightarrow \alpha$. Then, in the state of rank 1, by decomposition of α , the informon $\underline{\alpha}^{[1]} \Rightarrow \underline{\alpha}$ comes into existence and in this way emerged operand and operator phrases of the informon $\underline{\alpha}^{[1]}$ are put (memorised) to the subconscious domain as the entropon $\overline{\alpha}^{[1]} \Rightarrow \overline{\alpha}$. This means that initially in the conscious domain of the rank 0 there are the operand α and its informon $\underline{\alpha}$ simultaneously and in the subconscious domain of the rank 0 there are the operand α and its entropon $\overline{\alpha}$ simultaneously. However, α is the named operand of $\underline{\alpha}$ as well as $\overline{\alpha}$, and in this way already represented in

the both domains.

The beauty of iterative expression for the informational space in a top-down fashion can be presented by the following postulate:

The Top-Down Iterative Expression of the Informational Space

$$\begin{aligned}
 (\underline{\alpha}; \overline{\alpha})^{[i]} &\Rightarrow (\underline{\alpha}^{[i]}; \overline{\alpha}^{[i]}); \quad i = 0, 1, 2, \dots, \quad \text{where} \\
 \underline{\alpha}^{[i]} &\Rightarrow (\underline{\alpha}; \overline{\alpha})^{[i-1]}, \quad \overline{\alpha}^{[i]} \Rightarrow \overline{(\underline{\alpha}; \overline{\alpha})^{[i-1]}} \quad \text{and} \\
 \underline{\alpha}^{[0]} &\Rightarrow \alpha, \quad \overline{\alpha}^{[0]} \Rightarrow \alpha
 \end{aligned} \tag{29}$$

4 Models of the Informational Consciousness

The modelling of something like the IC can bring to the surface important new ideas, for instance, the formalistically hidden facts and the structurally and organisationally yet not at least explicitly revealed properties of the complex system. The first question of this sort is how the IC system could be organized hierarchically in the form of the system layers, but how simultaneously also the perplexedness of layers can be modelled. Another sort of illustration is the explanation by means of the currently active segments (e.g., informational spaces) on the surfaces of the one into another +incorporated spheres, representing the consciousness layers. These models will be discussed and presented in the following subsections, based on the recursive concept of the informational space, presenting also the terminology faced with the domains of the conscious, the subconscious, and the superconscious layers.

4.1 The Models of the IC Using the Hierarchy of the Consciousness Layers

The hierarchical and assymmetric layer model is presented in Fig. 4 and belongs to the first conceptual presentation of a possible system of informational consciousness. It proceeds from the formalistic expressions listed in Post. (28) and Post. (29), where the layers are a consequence of the so-called rank r , taking positive and negative values, and also the value 0 which marks the basic conscious layer. The positive ranks mark the superconscious layers, starting with the rank 1, so they can be called the superconscious layers up to the m -th superconscious layer. The negative ranks mark the subconscious layers, starting with the rank -1 , so they can be called the subconscious layers up to the $-m$ -th subconscious layer. We say that the superconscious layers expand upwards to an arbitrary superconscious height, while the subconscious layers expand downwards to an arbitrary subconscious depth. This disposition of layers can

be grasped as a kind of asymmetric hierarchy, although the layers are also mutually informationally (meaningly) perplexed, as it will be shown by the next model of possible interpretation. The perplexity itself is a consequence of the iterative structure of formalistic expressions in Post. (28) and Post. (29).

4.2 The Model of the IC Using a Simple Alternatively Perplexed State of the Consciousness Layers

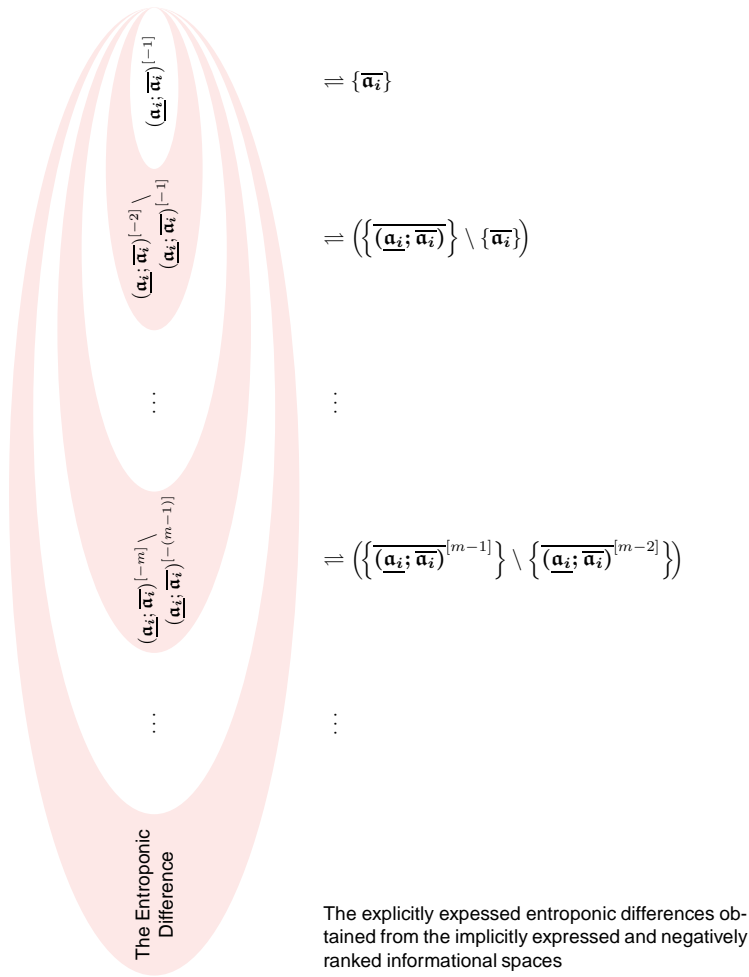
4.3 The Model of the IC Presenting Simultaneously the Hierarchy, Asymmetry and Perplexedness of the Consciousness Layers

The model of the IC presenting simultaneously the hierarchy, asymmetry and perplexedness of the consciousness layers discussed in Fig. 4 and in the text of Subsec. 4.1, belongs to the most integrative geometrical interpretations making explicit the various properties of IC by a single picture. The conscious layer, $(\underline{\mathbf{a}}_i; \overline{\mathbf{a}}_i)^{[0]}$, is evidently enclosed in subconscious and superconscious layers, having the access to all informational spaces and entropies of higher ranks. Each layer of the IC system is informationally perplexed with each other, so anyone can be informationally impacted by any other, and can informationally impact any other. In this way the deepest subconscious layers together with the highest superconscious layers can come to the conscious surface or influence the conscious layer, respectively. On the other side, the exterior events arriving to the conscious layer can trigger (cause) new superconscious happenings putting new operand and operator phrases to the corresponding subconscious levels (layers). All this creates a layer-based hierarchical structure and organisation and constitutes the evident sub-super-conscious asymmetry (informational sub-super-mirroring of layers). This conceptual and functional situation is presented in Fig. 6.

The development of the presented diagrammatical idea routes in the iterative unfolding of the concept of informational space, more precisely, on the informational space of informational space of a disinguisly named operand \mathbf{a}_i , that is,

$$(\underline{\mathbf{a}}_i; \overline{\mathbf{a}}_i) [(\underline{\mathbf{a}}_i; \overline{\mathbf{a}}_i)]$$

as described in Subsect. 3.1–3.2 by Post. 23–29.



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Figure 5: The white and the slightly shadowed areas represent the set differences of layers in the subconscious domain of the ICS, described in Fig. 4. A set difference makes explicit the part of operand and operator phrases used in the emerged superconscious informon and then added to the corresponding subconscious set phrases. Within this superconscious informon new operand and operator phrases come into the context of its meaning from an exterior phrase source or are just generated interiorly (innovatively) by the decomposition procedure. The higher the informon (the meaning), the deeper the entropion (the phrases belonging to the meaning).

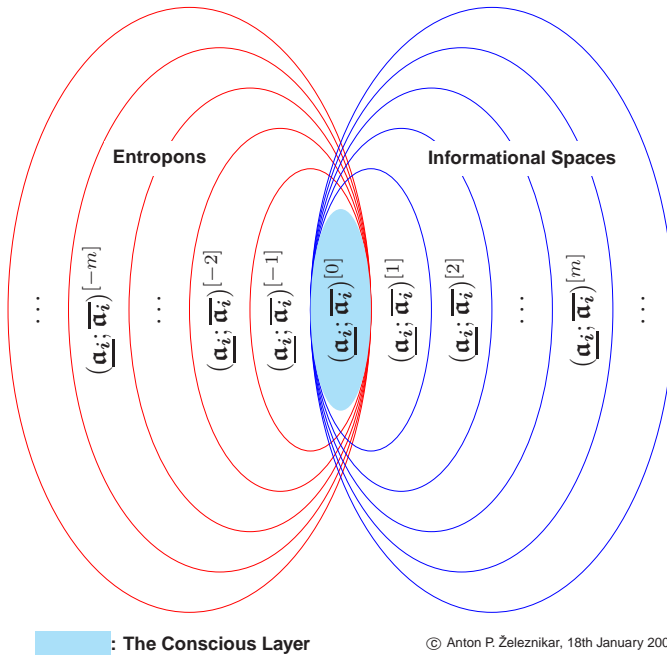


Figure 6: The diagram shows the complexity of the layers constituting the system of informational consciousness with hierarchical, asymmetric and layer-perplexed (transparently overlaid) structure and organization of the system, conceptualized by the iterative induction of informational spaces and entropions. The sub- and superconscious layers actually enclose the conscious layer and enable that this sort of components can appear in the actual state of consciousness.

4.4 The Models of the IC Using the Sphere Segments as the Consciousness Layers

4.5 Other Possible Models

The universe of meaning of the IC

5 The Procedure of the Informational Decomposition

In the framework of informational philosophy, the concept of informational decomposition lacks precise determinations how in a concrete case the decomposition will move over the existing consciousness graph and how other input entities will be acquired to make the decomposition not only complex but also senseful, fitting the currently actual intentions and other possible “higher” forms within the conscious happenings. Certain higher forms of conscious informing can just be listed, but to these ones also a kind of administrative or data-relevant entites must be take into account. The initial list of informational entites and procedures is the following:

creativity is the property of consciousness, but it is also a regular concept in ethnic languages possessing a specific meaning which, in the future, must be developed up to a useful and senseful extent;

intuition is a concrete superconscious entity playing a substantial role of a “higher conscious function” in creativity and vice versa, but being not more precisely defined and sufficiently known as a regular meaning of the concept;

moving along the paths of a conscious graph is only superficially conceptualised when verbally speaking about the decomposition operation in generating meaning for a named informational entity;

adding new operands and their connections to the consciousness graph must be not only clearly determined, but exactly formalised;

administrative tools of the so-called decomposition procedure must be clearly expressed in details and formalised to the level for their automatic use when the procedure is being called for its execution based on given arguments.

5.1 Informational Creativity

Informational creativity must be systematically studied, researched and specified, using all the available knowledge and, in this respect, because of its complexity and detailed comprehensiveness, surpassing the properties of a group of particular and collective human minds. However, to a reasonable degree, it must be disciplined to stay within the framework of sensible, understandable, developmental and innovative information. The creativity must deliver something surprising not only for an average mind but also for the intellectually most developed individual and collective spiritual dispositions. And, it must possess the tendency to penetrate into the mysteries being known as unresearchable by the enormous amount of perplexed and operable knowledge.

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Index

F

formalisation
of informational and conscious
phenomena, 1

I

informational
as the modifier, 1

M

machine
with abilities of consciousness, 1
motivation
of the informational, 2

N

network
of informational spaces as IC, 2

S

scientific ideal
as the study of consciousness, 1