

Keywords: axiomatization, circularity, externalism, functionalism, informational axioms, intelligent informational entity, internalism, metaphysics, parallelism, phenomenalism

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This essay brings an approach to the possibilities of axiomatization in the realm of the informational. The axiomatization begins from the *informatio prima* which says that entities inform or, formally, $\alpha \models$. This primary postulate causes logical consequences which are comprehended as extensions of the primary axiom of informing of entities (informing as externalism, informedness as internalism, circularity as metaphysics, and informational openness as phenomenalism). A consequent axiomatic deduction (together with operational particularization) is shown for general, alternative, negative, alternative negative, functional, metaphysical, parallel, and intelligent informational cases. Informational axiomatization is a part of the informational logic in which the notion of information is extended to the phenomenal extremity. Axioms are expressed by the formalized symbolism which considers the concept of the informing/informedness (active/passive, subjective/objective, operand/operator) nature of informational entities [TIL].

Osnovni informacijski aksiomi

Ta spis prinaša nekatere možnosti aksiomatizacije v domeni informacijskega. Postopek aksiomatiziranja se začne pri t.i. *informatio prima*, ki govori, da bivačoč informira, ali formalno $\alpha \models$. Ta prvi postulat povzroča logične posledice, ki jih razumemo kot razširitve prvotnega aksioma informiranja bivačočega (informiranje kot eksternalizem, informiranost kot internalizem, cirkularnost kot metafizika in informacijska odprtost kot fenomenalizem). Pokazana je dosledna aksiomska dedukcija (skupaj z operacijsko partikularizacijo) za splošni, alternativni, negativni, alternativno negativni, funkcijski, metafizični, paralelni in inteligentni informacijski primer. Informacijska aksiomatizacija je le del informacijske logike, kjer je pojem informacije razširjen do skrajnih pojavnih mej. Aksiomi so izraženi s formaliziranimi simboli, ki upoštevajo koncept informiranja/informiranosti (aktivne/pasivne, subjektivne/objektivne, operadne/operatorske) narave informacijskih entitet [TIL].

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0. Introduction

...das Mathematische will sich selbst, im Sinne seiner eigenen inneren Forderung, begründen; es will sich selbst ausdrücklich als Maßstab *allen* Denkens herausstellen und die daraus entspringenden Regeln aufstellen.

—Martin Heidegger [FND] 78

Nowadays, the background of informational reasoning seems to be more or less forgotten, fallen into oblivion, but also unrevealed and still subconscious. The broadened notion of information [Owi] was the initial step to this recognition in which formal principles and their consequences have been brought to the reader's consciousness.

To develop a broadened and complete theory of information and informational phenomenology,

an exhaustive axiomatic background of informing of entities is needed, on which the arising phenomenism, scenery, processibility and, lastly, formalism can be built up. This step is necessary not only with the aim to broaden the scope of informational cognition, but also to prepare the basis for the future development of that what we call the informational machine. The reader must be aware that informational axiomatization, in opposition to the known mathematical one, is a continuum in which a new axiom or theorem can always arise between two already existing ones. Informational continuum appears as an infinitesimal realm of information and an informational theory is never developed to an end, staying open for further change, improvement, and broadening. In this essay we shall discuss these assertions among several others.

Axioms are formal principles which arise from the principal position and attitude of the logical mind. Informational axioms—among others, for instance, mathematical ones—are the most general and can absorb any thinkable axiomatic concept and include it appropriately into the observed informational system. This is a hypothetical assertion which can always be proven from one concrete case to another. The informational seems, at best, to be the most adequate principle of the universe. We shall try to give a principled explanation of this assertion at the end of the essay.

Our way to the realm of axiomatic scenery of the informational must begin with some very basic assertion, which could be called *informatio prima*. Afterwards, axioms, logical consequences, and theorems can arise in a logically spontaneous, however, systematized way. Let us open this realm of cognition in the next section of the essay.

1. Basic Axioms

Der Grundzug muß in jenem bestehen, was die Grundbewegung der Wissenschaft als solcher gleichursprünglich maßgebend durchherrscht: es ist der Arbeitsumgang mit den Dingen und der metaphysische Entwurf der Dingheit der Dinge. Wie sollen wir diesen Grundzug fassen?

—Martin Heidegger [FND] 52

As in any axiomatic system, some basic questions prevail: Where is the origin of the informational

axiomatic system? Which is the first, most natural axiom, from which other axioms and consequences arise in a possible, logical, and systematic way?

As the so-called *informatio prima* of any logic the following could be asserted: *Entities inform*. If something (an entity figuring as the operand) is marked by α , we can say that α informs. This statement, consciously or unconsciously, primordially constitutes the first principle of any theory and can be expressed symbolically by

$$(1) \quad \alpha \Rightarrow (\alpha \models)$$

This axiom is *informatio prima* and pertains to any entity, that is, operand, marked by α . The axiom is expressed in the implicative form, using informational operator of implication, \Rightarrow , which is read as »implies (that)« from the left to the right, and as »is implied by« from the right to the left of formula (1). In the same way, operator \models is read »informs« in the one, and »is informed by« in the other direction. Thus, for formula (1) we have the following explanations: Entity α implies that it informs. Entity α implies that something (the empty place on the right of operator \models) is informed by it. Anytime and anywhere *we have* or *there is* an entity α , it informs ($\alpha \models$).

One of the very essential comments to axiom (1) is that its formula is circular in respect to entity α (operand α occurs on the left and on the right side of operator \Rightarrow). The other comment is, that α as an informing entity, transmits (operator \models on the right of operand α) its phenomenality into the informational universe.

The first axiom induces consequences which can still be understood as axiomatic. Namely, if we adopt the fact of this axiom, that »if α , then α informs«, then probably something—some other or the same entity—must and can be informed. *To inform without to be informed* would not have any particular sense in the realm of the informational which is the universe of informing (phenomenalizing) of information (phenomena). Thus, the second most fundamental axiom is coming to the surface, as

$$(2) \quad \alpha \Rightarrow (\models \alpha)$$

We can show the basic way to this axiom from the first axiom and vice versa by the following asser-

tion: if α informs, then something (α, β, \dots) would be informed. This fact yields

$$(3) \quad (\alpha \models) \Rightarrow (\models \alpha)$$

which is a consequence of axiomatic character. Further by a similar logical reasoning, which says, that if something is informed, there exists, sometime and somewhere, an informing entity α , thus,

$$(4) \quad (\models \alpha) \Rightarrow (\alpha \models)$$

The last two axiomatic consequences can be certainly interpreted more universally, by introduction of different entity markers $\alpha, \beta, \gamma, \dots$. So,

$$(3') \quad (\alpha \models) \Rightarrow (\models \alpha, \beta, \gamma, \dots)$$

$$(4') \quad (\models \alpha) \Rightarrow (\alpha, \beta, \gamma, \dots \models)$$

These consequences explicate the openness of the informational universe in respect to the informing and informedness of an entity α , where it can inform and be informed by several entities (operands), simultaneously.

To remain strictly consequent, axiom (2) follows from axiom (1) in the way

$$(5) \quad (\alpha \Rightarrow (\alpha \models)) \Rightarrow (\models \alpha)$$

or logically, even more exactly,

$$(6) \quad (\alpha \Rightarrow (\alpha \models)) \Rightarrow (\alpha \Rightarrow (\models \alpha))$$

As already mentioned, in axiom (1) and its consequences the property of α 's circularity is hidden. Formula (1) is evidently implicatively circular in respect to α , since operand α stands on the left and on the right side of operator \Rightarrow . Together with formula (1), also formulas (2) to (6) are perplexedly α -circular. This circularity is of especial interest in case of formulas (3) and (4), since they enable to conclude on α 's particular informing which we call metaphysics of entity α . The initial state of α 's metaphysics is expressed by formula

$$(7) \quad \alpha \Rightarrow (\alpha \models \alpha)$$

This formula reads: α implies that α informs α and is informed by α . Or, in general, an entity informs (impacts) itself and is informed (impacted) by it-

self. Formula (7) is a consequence of both formulas (3) and (4), that is,

$$(8) \quad ((\alpha \models) \Rightarrow (\models \alpha)) \Rightarrow (\alpha \models \alpha)$$

where the so-called metaphysics follows from the circularly tied informing and informedness of α and

$$(9) \quad ((\models \alpha) \Rightarrow (\alpha \models)) \Rightarrow (\alpha \models \alpha)$$

where metaphysics is a consequence of simultaneous, cyclically tied informedness and informing of α . Last two formulas conceptualize the circular or cyclic nature of an informational entity (operand, also informational formula) α .

The next essential consequence in the framework of *informatio prima* follows directly from both axioms (1) and (2). This consequence speaks that an entity informs and is informed simultaneously, that it is the informational system of an entity's informing and informedness. Thus, at the end of such concluding, there is,

$$(10) \quad \alpha \models (\alpha \models; \models \alpha)$$

This formula is not only the most general, but also the most open expression pertaining to entity α and its environment, to α 's phenomenality in space and time. It makes evident that α will inform some, yet unidentified entities and itself in the form $\alpha \models$ and that it will be informed by some, yet unidentified entities and itself in the form $\models \alpha$. It is evident that both formulas $\alpha \models$ and $\models \alpha$ are completely open, having the operand empty place on the right and on the left side of operator \models , consequently.

The next question concerns the informational spontaneity of an informing entity. How does spontaneity concern the basic axioms?

Within $\alpha \models$, entity α informs in a spontaneous way. Spontaneity is the axiomatic property of operand α as well as operator \models . Informing of any informational entity α is spontaneous within the α 's informational cycle which is constituted by informing, counter-informing, and embedding of information. Further, in $\alpha \models$, operator \models is particularized in a concrete case and marks only different possibilities of α 's operating potentiality.

Formulas $\alpha \models$ and $\models \alpha$ depict phenomenality of one and the same entity α . They express

possibilities of α 's informational impacting and impactedness, that is, to impact the world and to be impacted by the world. The impacting and impactedness of an entity is spontaneous, uncertain and, in general, indeterminable. The spontaneity of α 's informing can be understood through its metaphysics, $\alpha \models \alpha$, which can be informationally decomposed by different observers in different (spontaneous) ways.

After this discussion we can summarize the four basic implicative axioms (*informatio prima*) pertaining to an informational entity α , as follows:

- (11) (1°) $\alpha \Rightarrow (\alpha \models)$ [externalism of α]
 (2°) $\alpha \Rightarrow (\models \alpha)$ [internalism of α]
 (3°) $\alpha \Rightarrow (\alpha \models \alpha)$ [metaphysics of α]
 (4°) $\alpha \Rightarrow (\alpha \models; \models \alpha)$ [phenomenalism of α]

Let us have the following dictionary of the primary four informational cases of informing:

- (12) (1°) $\alpha \models$: external informing of α ;
 α 's informational impacting;
 α 's informing (informingness)
 (2°) $\models \alpha$: internal informing of α ;
 α 's informational impactedness;
 α 's informedness
 (3°) $\alpha \models \alpha$: metaphysical informing of α ;
 α 's metaphysical circularity;
 α 's informational metaphysicalness
 (4°) $\alpha \models; \models \alpha$: phenomenal informing and informedness of α ;
 α 's informing and informedness
 phenomenality;
 α 's complex phenomenalism

There are different modes of general informing and it is possible to make a rough classification in the following sense:

general informing: operator \models ;
alternative general informing: operator \models ;
negative general informing: operator $\not\models$;
alternative negative general informing: $\not\models$;

parallel general informing: operator \models ;
parallel alternative general informing:
 operator \models ;

parallel negative general informing:
 operator $\not\models$;
parallel alternative negative general informing: operator $\not\models$;

cyclic general informing: operator \models ;
cyclic alternative general informing:
 operator $\not\models$;
cyclic negative general informing:
 operator $\not\models$;
cyclic alternative negative general informing: operator $\not\models$;

parallel-cyclic general informing:
 operator \models ;
parallel-cyclic alternative general informing: operator $\not\models$;
parallel-cyclic negative general informing:
 operator $\not\models$;
parallel-cyclic alternative negative general informing: operator $\not\models$

To all these cases the so-called subscribed informational operators can be added. A subscript (for instance, subs) means an operational particularization or universalization. Thus, such operators are:

$\models_{\text{subs}}, \models_{\text{subs}}, \not\models_{\text{subs}}, \not\models_{\text{subs}}, \models_{\text{subs}}, \models_{\text{subs}}, \not\models_{\text{subs}}, \not\models_{\text{subs}}, \models_{\text{subs}}, \models_{\text{subs}}, \not\models_{\text{subs}}, \not\models_{\text{subs}}, \not\models_{\text{subs}}, \not\models_{\text{subs}}$

and, certainly various operators of the type

$\perp_{\text{subs}}, \lrcorner_{\text{subs}}, \lrcorner_{\text{subs}}, \lrcorner_{\text{subs}}, \wedge_{\text{subs}}, \vee_{\text{subs}}, \neg_{\text{subs}}, \Rightarrow_{\text{subs}}, \Leftarrow_{\text{subs}}, \Leftrightarrow_{\text{subs}}, \equiv_{\text{subs}}, \neq_{\text{subs}}, =_{\text{subs}}, \neq_{\text{subs}}, \forall_{\text{subs}}, \exists_{\text{subs}}, \blacksquare_{\text{subs}}, \in_{\text{subs}}, \notin_{\text{subs}}, \subset_{\text{subs}}, \not\subset_{\text{subs}}, \omega_{\text{subs}}, \circ_{\text{subs}}$

etc. with particular meanings.

We may not forget that all operators (arbitrarily universalized or particularized) used within informational logic are informational. Informational operators are attributes (properties, phenomenality, happenings, predicates) belonging to the informing and informed entities (operands, formulas, formulas within formulas) and connecting them informationally. The direction (operational orientation or directionality) of operators depends on the verbal definition of a particular informational operator. For instance, in their

simple present tense, some verbal forms as »informs«, »include«, »operates«, etc. are oriented from the left to the right operand, while others, for instance, »observes«, »understand«, »conceives«, etc. are oriented from the right to the left operand. Thus, we can distinguish externally and internally oriented operators as determined by simple present tense of verbs. Operands are marked informational entities which are single Greek or Fraktur symbols or formulas composed of operands, operators, parentheses, commas, and semicolons. We shall show the syntactic structure of informational formulas later on.

2. Alternative Basic Axioms

Zum Wesen des Mathematischen als Entwurf gehört das Axiomatische, die Ansetzung von Grundsätzen, aus denen alles Weitere in einsichtiger Folge gründet. Wenn das Mathematische in Sinne einer *mathesis universalis* das gesamte Wissen begründen und gestalten soll, dann bedarf es der Aufstellung ausgezeichneter Axiome.

—*Martin Heidegger* [FND] 79

We are interested to have explicit alternative possibilities to the discussed basic axioms with the aim to be able expressing explicitly the possible alternatives in each particular case as well as on the most general level. Alternative axiomatic alternatives pertain also to the principle of informational spontaneity and to other possibilities of informing, for instance, to negative informing or non-informing, parallel, serial, cyclic, parallel-cyclic informing, etc. How it is possible to express alternative informing in cases of the most general and particular informing?

The alternative possibility of informing speaks in favor of the ability to express simultaneously the case of basic (in general \models -operational) and alternative (\models -operational) informing. We say that an entity informs in one (basic or general) or another (alternatively basic or general) way. How to mark the so-called other case?

In general, entity α informs and is informed in this and that way. It informs alternatively and such situation can be expressed symbolically

$$(1^A) \quad \alpha \Rightarrow (\models \alpha)$$

The differences between formula (1) and (1^A) are the following:

(i) Operators \models and \models are counter-oriented, for instance, operator \models is the left-right and operator \models the right-left symbol. Through this we can read formula $\alpha \models$ as α informs and formula $\models \alpha$ as α informs alternatively (in respect to the case $\alpha \models$).

(ii) Simultaneously, operators \models and \models are dual to each other in the sense of informing and informedness of an entity. For instance, if $\alpha \models$ means α informs, then $\alpha \models$ would mean α is informed (alternatively). We can read operators (or formulas) strictly from the left to the right side. This possibility of reading is important for the distinguishing of verbal cases in which something impacts (is impacting) something informationally and something is impacted by something informationally. The following meanings of informational operator duality can be used:

operator type \models	operator type \models
informs	is_informed(_by)
is informing	is_being_informed(_by)
informed	has/have_been_ _informed(_by)
has/have_been_ _informing	has/have_been_ _informed (by)
was/were_informing	had_been_informed(_by)
will/shall_inform	will/shall_be_ _informed(_by)

etc. In short, the left side of operator \models and the right side of operator \models behave as informing entities irrespective of the tenses. On contrary, the right side of operator \models and the left side of operator \models behave as informed entities irrespective of the tenses.

(iii) In regard to formula (1^A) , to be alternatively consequent, one could introduce the alternative basic implicative axiom in the form

$$(1^A) \quad (\models \alpha) \Leftarrow \alpha$$

This formula is read from the left to the right as: $\models \alpha$ is implied alternatively by α . From the right to the left, this formula can be read »normally«, that is, α implies alternatively $\models \alpha$. The complete possibility of meaning is the following: » α informs

alternatively« is implied *alternatively* by α . In the opposite direction one can read: α *implies alternatively* that α *informs alternatively*.

As we see, the alternative axioms can now be obtained automatically from the basic, non-alternative ones, that is,

- (2^A) $\alpha \Rightarrow (\alpha \Rightarrow)$
 (3^A) $(\Rightarrow \alpha) \Rightarrow (\alpha \Rightarrow)$
 (4^A) $(\alpha \Rightarrow) \Rightarrow (\Rightarrow \alpha)$
 (5^A) $(\alpha \Rightarrow (\Rightarrow \alpha)) \Rightarrow (\alpha \Rightarrow)$
 (6^A) $(\alpha \Rightarrow (\Rightarrow \alpha)) \Rightarrow (\alpha \Rightarrow (\alpha \Rightarrow))$
 (7^A) $\alpha \Rightarrow (\alpha \Rightarrow)$
 (8^A) $((\Rightarrow \alpha) \Rightarrow (\alpha \Rightarrow)) \Rightarrow (\alpha \Rightarrow \alpha)$
 (9^A) $((\alpha \Rightarrow) \Rightarrow (\Rightarrow \alpha)) \Rightarrow (\alpha \Rightarrow \alpha)$
 (10^A) $\alpha \Rightarrow (\Rightarrow \alpha; \alpha \Rightarrow)$
 (11^A) (1°) $\alpha \Rightarrow (\Rightarrow \alpha)$ [alternative externalism of α]
 (2°) $\alpha \Rightarrow (\alpha \Rightarrow)$ [alternative internalism of α]
 (3°) $\alpha \Rightarrow (\alpha \Rightarrow \alpha)$ [alternative metaphysics of α]
 (4°) $\alpha \Rightarrow (\Rightarrow \alpha; \alpha \Rightarrow)$ [alternative phenomenalism of α]
 (12^A) (1°) $\Rightarrow \alpha$: alternative external informing of α ;
 α 's alternative informational impacting;
 α 's alternative informing (informingness)
 (2°) $\alpha \Rightarrow$: alternative internal informing of α ;
 α 's alternative informational impactedness;
 α 's alternative informedness
 (3°) $\alpha \Rightarrow \alpha$: alternative metaphysical informing of α ;
 α 's alternative metaphysical circularity;
 α 's alternative informational metaphysicalness
 (4°) $\Rightarrow \alpha; \alpha \Rightarrow$: alternative phenomenal informing and informedness of α ;
 α 's alternative informing and informedness phenomenality;
 α 's alternatively complex phenomenalism

In regard to the informational, the alternative informational means to have (possess) another pos-

sibility of informing to the already existing or identified one. Informational alternativeness is one of the basic principles of informational spontaneity, where in each particular case of informing an unforeseen, uncertain, indeterminable alternative possibility can arise and come into existence.

3. Axioms of Negative and Negative Alternative Informing

Negative (negating, negational) informing, called also non-informing, is an alternative mode of informing in comparison to basic and alternative basic informing of an entity. Negative informing is, for instance, from the observer's point of view, something which is missing informationally in the informing activity of an entity. On the other side, the informing entity can inform by itself the deficiency of its certain informational impacting and, in this way, cannot influence the informationally tied entity in some other way. Negative informing belongs to the oldest cultural forms of communication and language. Within this tradition a clear distinction between informing (or informedness) and non-informing (or non-informedness) of entities is possible and sensible.

In general case, where \models marks the (positive) informing, the negative case is marked by $\not\models$ with the meaning »does or do not inform« or, on the other hand, »is or are not informed (by)«.

For any imagined entity it can be said that it does not inform in a certain (particular) way. This seem to be a natural situation of things which certainly cannot inform in all possible ways. The assertion »entity α does not inform« is expressed symbolically

$$(1^N) \quad \alpha \Rightarrow (\alpha \not\models)$$

Axiom (1^N) is a particular case of *informatio prima*, is in the realm of non-informing of entity α . And certainly, if α does not inform in a certain way, then something cannot be informed in a certain way. According to axiom (2) for informing of an entity, we have the negative axiom

$$(2^N) \quad \alpha \Rightarrow (\not\models \alpha)$$

This axiom reads: if α is an entity, then it is not informed in a way. As we recognize, the negative axioms can now be obtained automatically from the basic, non-alternative ones, that is,

- (3^N) $(\alpha \nmid \neq) \Rightarrow (\neq \alpha)$;
 (4^N) $(\neq \alpha) \Rightarrow (\alpha \nmid \neq)$;
 (5^N) $(\alpha \Rightarrow (\alpha \nmid \neq)) \Rightarrow (\neq \alpha)$;
 (6^N) $(\alpha \Rightarrow (\alpha \nmid \neq)) \Rightarrow (\alpha \Rightarrow (\neq \alpha))$;
 (7^N) $\alpha \Rightarrow (\alpha \nmid \neq \alpha)$;
 (8^N) $((\alpha \nmid \neq) \Rightarrow (\neq \alpha)) \Rightarrow (\alpha \nmid \neq \alpha)$;
 (9^N) $((\neq \alpha) \Rightarrow (\alpha \nmid \neq)) \Rightarrow (\alpha \nmid \neq \alpha)$;
 (10^N) $\alpha \Rightarrow (\alpha \nmid \neq; \neq \alpha)$;
 (11^N) (1°) $\alpha \Rightarrow (\alpha \nmid \neq)$ [negative externalism of α]
 (2°) $\alpha \Rightarrow (\neq \alpha)$ [negative internalism of α]
 (3°) $\alpha \Rightarrow (\alpha \nmid \neq \alpha)$ [negative metaphysics of α]
 (4°) $\alpha \Rightarrow (\alpha \nmid \neq; \neq \alpha)$ [negative phenomenalism of α]
 (12^N) (1°) $\alpha \nmid \neq$: negative external informing of α ;
 α 's negative informational impacting;
 α 's negative informing (informingness)
 (2°) $\neq \alpha$: negative internal informing of α ;
 α 's negative informational impactedness;
 α 's negative informedness
 (3°) $\alpha \nmid \neq \alpha$: negative metaphysical informing of α ;
 α 's negative metaphysical circularity;
 α 's negative informational metaphysicalness
 (4°) $\alpha \nmid \neq; \neq \alpha$: negative phenomenal informing and informedness of α ;
 α 's negative informing and informedness phenomenality;
 α 's negative complex phenomenalism

The negative informational in regard to the informational means the lack of certain possibility of informing in regard to already existing or identified one. Informational negativism is one of the basic principles of informational spontaneity,

where in each particular case of informing a negative unforeseen, uncertain, indeterminable possibility can arise and come into existence.

The alternativeness of the negative informing can be expressed explicitly. It is important to have the possibility of alternative negative informing and informedness on a universal and particular level. Thus, we can repeat the entire system of formal expressiveness and its meaning for alternative negative informing as follows:

- (1^{AN}) $\alpha \Rightarrow (\neq \alpha)$;
 (2^{AN}) $\alpha \Rightarrow (\alpha \neq)$;
 (3^{AN}) $(\neq \alpha) \Rightarrow (\alpha \neq)$;
 (4^{AN}) $(\alpha \neq) \Rightarrow (\neq \alpha)$;
 (5^{AN}) $(\alpha \Rightarrow (\neq \alpha)) \Rightarrow (\alpha \neq)$;
 (6^{AN}) $(\alpha \Rightarrow (\neq \alpha)) \Rightarrow (\alpha \Rightarrow (\alpha \neq))$;
 (7^{AN}) $\alpha \Rightarrow (\alpha \neq \alpha)$;
 (8^{AN}) $((\neq \alpha) \Rightarrow (\alpha \neq)) \Rightarrow (\alpha \neq \alpha)$;
 (9^{AN}) $((\alpha \neq) \Rightarrow (\neq \alpha)) \Rightarrow (\alpha \neq \alpha)$;
 (10^{AN}) $\alpha \Rightarrow (\neq \alpha; \alpha \neq)$;
 (11^{AN}) (1°) $\alpha \Rightarrow (\neq \alpha)$ [alternative negative externalism of α]
 (2°) $\alpha \Rightarrow (\alpha \neq)$ [alternative negative internalism of α]
 (3°) $\alpha \Rightarrow (\alpha \neq \alpha)$ [alternative negative metaphysics of α]
 (4°) $\alpha \Rightarrow (\neq \alpha; \alpha \neq)$ [alternative negative phenomenalism of α]
 (12^{AN}) (1°) $\neq \alpha$: alternative negative external informing of α ;
 α 's alternative negative informational impacting;
 α 's alternative negative informing (informingness)
 (2°) $\neq \alpha$: alternative negative internal informing of α ;
 α 's alternative negative informational impactedness;
 α 's alternative negative informedness
 (3°) $\alpha \neq \alpha$: alternative negative metaphysical informing of α ;
 α 's alternative negative metaphysical circularity;
 α 's alternative negative informational metaphysicalness
 (4°) $\neq \alpha; \alpha \neq$: alternative negative phenomenal informing and informedness of α ;

α 's alternative negative informing
and informedness
phenomenality;
 α 's alternative negative complex
phenomenalism

4. Axioms of Basic and Basic Alternative Parallelism

Parallelism belongs to the most significant philosophical and technological approaches of modernism. Communication and cooperation among parallel processes constitute the kernel of mastering of complex computing machinery which architecture is built-up in a massively parallel structure and organization together with signal processing and networking. And this is the reason why we shall strictly repeat the scenario of axiomatization for the case of parallel and alternative parallel informing.

Informational parallelism means that entities inform freely, that is, spontaneously and circularly in parallel ways. An operand as an informationally open entity (phenomenalism) informs unforeseeably parallel and is in this way informed. It means that from the informational point of view, there are no limits for a concrete parallelism: it can be extended or suppressed in case of any informational entity (operand) in question. So, let us discuss this particular situation in some axiomatic details.

For any imagined entity it can be said that it informs in a parallel way, that its »signals« are spread (broadcasted) in space and time where they can impact entities physically, observationally, or in other ways. This seem to be a natural situation of things which inform in all possible ways to different places and sites. The assertion »entity α informs in parallel« is expressed symbolically

$$(1^P) \quad \alpha \Rightarrow (\alpha \Vdash)$$

Axiom (1^P) is the parallel case of *informatio prima*, is in the realm of the parallel informing of entity α . And certainly, if α informs in parallel ways, then entities are informed in parallel. According to axiom (2) for informedness of an entity, we have the parallel axiom

$$(2^P) \quad \alpha \Rightarrow (\Vdash \alpha)$$

This axiom reads: if α is an entity, then it is and can be informed by several (parallel) entities simultaneously. From this point on, the parallel axioms can be produced automatically from the basic ones, that is,

- $$(3^P) \quad (\alpha \Vdash) \Rightarrow (\Vdash \alpha);$$
- $$(4^P) \quad (\Vdash \alpha) \Rightarrow (\alpha \Vdash);$$
- $$(5^P) \quad (\alpha \Rightarrow (\alpha \Vdash)) \Rightarrow (\Vdash \alpha);$$
- $$(6^P) \quad (\alpha \Rightarrow (\alpha \Vdash)) \Rightarrow (\alpha \Rightarrow (\Vdash \alpha));$$
- $$(7^P) \quad \alpha \Rightarrow (\alpha \Vdash \alpha);$$
- $$(8^P) \quad ((\alpha \Vdash) \Rightarrow (\Vdash \alpha)) \Rightarrow (\alpha \Vdash \alpha);$$
- $$(9^P) \quad ((\Vdash \alpha) \Rightarrow (\alpha \Vdash)) \Rightarrow (\alpha \Vdash \alpha);$$
- $$(10^P) \quad \alpha \Rightarrow (\alpha \Vdash; \Vdash \alpha);$$
- $$(11^P) \quad (1^\circ) \quad \alpha \Rightarrow (\alpha \Vdash) \text{ [parallel externalism of } \alpha]$$
- $$(2^\circ) \quad \alpha \Rightarrow (\Vdash \alpha) \text{ [parallel internalism of } \alpha]$$
- $$(3^\circ) \quad \alpha \Rightarrow (\alpha \Vdash \alpha) \text{ [parallel metaphysics of } \alpha]$$
- $$(4^\circ) \quad \alpha \Rightarrow (\alpha \Vdash; \Vdash \alpha) \text{ [parallel phenomenality of } \alpha]$$
- $$(12^P) \quad (1^\circ) \quad \alpha \Vdash: \text{ parallel external informing of } \alpha;$$
- α 's parallel informational impacting;
 α 's parallel informing (informingness)
- $$(2^\circ) \quad \Vdash \alpha: \text{ parallel internal informing of } \alpha;$$
- α 's parallel informational impactedness;
 α 's parallel informedness
- $$(3^\circ) \quad \alpha \Vdash \alpha: \text{ parallel metaphysical informing of } \alpha;$$
- α 's parallel metaphysical circularity;
 α 's parallel informational metaphysicalness
- $$(4^\circ) \quad \alpha \Vdash; \Vdash \alpha: \text{ parallel phenomenal informing and informedness of } \alpha;$$
- α 's parallel informing and informedness phenomenality;
 α 's parallel complex phenomenality

The parallel informational in regard to the informational means the possibility of informing addi-

tionally in regard to already existing or identified modes, that is, simultaneously in many different modes. Informational parallelism is one of the basic principles of informational spontaneity, where in each particular case of informing a parallel unforeseen, uncertain, indeterminable possibility can arise and come into existence.

The alternativeness of the parallel informing can be expressed explicitly. It is important to have the possibility of alternative parallel informing and informedness on a universal and particular level. Thus, we can repeat the entire system of formal expressiveness and its meaning for alternative parallel informing as follows:

- (1^{AP}) $\alpha \Rightarrow (=|| \alpha)$
 (2^{AP}) $\alpha \Rightarrow (\alpha =||)$
 (3^{AP}) $(=|| \alpha) \Rightarrow (\alpha =||)$;
 (4^{AP}) $(\alpha =||) \Rightarrow (=|| \alpha)$;
 (5^{AP}) $(\alpha \Rightarrow (=|| \alpha)) \Rightarrow (\alpha =||)$;
 (6^{AP}) $(\alpha \Rightarrow (=|| \alpha)) \Rightarrow (\alpha \Rightarrow (\alpha =||))$;
 (7^{AP}) $\alpha \Rightarrow (\alpha =|| \alpha)$;
 (8^{AP}) $((=|| \alpha) \Rightarrow (\alpha =||)) \Rightarrow (\alpha =|| \alpha)$;
 (9^{AP}) $((\alpha =||) \Rightarrow (=|| \alpha)) \Rightarrow (\alpha =|| \alpha)$;
 (10^{AP}) $\alpha \Rightarrow (=|| \alpha; \alpha =||)$;
 (11^{AP}) (1°) $\alpha \Rightarrow (=|| \alpha)$ [alternative parallel externalism of α]
 (2°) $\alpha \Rightarrow (\alpha =||)$ [alternative parallel internalism of α]
 (3°) $\alpha \Rightarrow (\alpha =|| \alpha)$ [alternative parallel metaphysics of α]
 (4°) $\alpha \Rightarrow (=|| \alpha; \alpha =||)$ [alternative parallel phenomenalism of α]
 (12^{AP}) (1°) $=|| \alpha$: alternative parallel external informing of α ;
 α 's alternative parallel informational impacting;
 α 's alternative parallel informing (informingness)
 (2°) $||= \alpha$: alternative parallel internal informing of α ;
 α 's alternative parallel informational impactedness;
 α 's alternative parallel informedness
 (3°) $\alpha =|| \alpha$: alternative parallel metaphysical informing of α ;
 α 's alternative parallel metaphysical circularity;
 α 's alternative parallel

informational metaphysicalness
 (4°) $=|| \alpha; \alpha =||$: alternative parallel phenomenal informing and informedness of α ;
 α 's alternative parallel informing and informedness phenomenality;
 α 's alternative parallel complex phenomenalism

The parallel informational phenomenality concerns the most sophisticated metaphysical and intelligent conceptuality (phenomenology) of the informational (mathematical, mathetical in the sense of the Greek *mathesis*). In an informational situation, parallel informational phenomena pertaining to this situation can come into existence. The general and particular operators of informational parallelism ($||=$, $=||$, $||\neq$, $\neq||$) express this faculty of parallel phenomenality in a positive or negative way. Therefore, the following parallel circularity can be considered as the most significant in the context of parallel informational system composition and decomposition:

- (13^P))Parallel circular externalism:
 $(\alpha ||=) \Rightarrow (\alpha ||=)$;
 $(\alpha ||=) \Rightarrow (\alpha ||=; \dots; \alpha ||=)$;
 Parallel circular internalism:
 $(||= \alpha) \Rightarrow (||= \alpha)$;
 $(||= \alpha) \Rightarrow (||= \alpha; \dots; ||= \alpha)$;
 Parallel circular metaphysics:
 $(\alpha ||= \alpha) \Rightarrow (\alpha ||= \alpha)$;
 $(\alpha ||= \alpha) \Rightarrow (\alpha ||= \alpha; \dots; \alpha ||= \alpha)$;
 Parallel circular phenomenalism:
 $(\alpha ||=; ||= \alpha) \Rightarrow (\alpha ||=; ||= \alpha)$;
 $(\alpha ||=; ||= \alpha) \Rightarrow (\alpha ||=; ||= \alpha; \dots; \alpha ||=; ||= \alpha)$

As one can understand, informational parallelism brings into the focus the so-called parallel circular mode of informational arising of entities, systems, formulas, etc.

5. Axioms of Informational Function

Wir bringen diesen gesuchten Grundcharakter der neuzeitlichen Wissenshaltung auf einen Titel, wenn wir sagen: Der neue Wissensanspruch ist der *mathematische*. Von Kant stammt der oft angeführte, aber noch wenig begriffene Satz: »Ich

behaupte aber, daß in jeder besonderen Naturlehre nur so viel *eigentliche* Wissenschaft angetroffen werden könne, als darin *Mathematik* anzutreffen ist.«

—Martin Heidegger [FND] 52

A function φ is an acting or producing informational entity in the realm of several, the function concerning entities. Therefore, it is senseful to speak about a functional scheme in which different entities can be involved when functional activity is coming into existence. It means that the functional scheme should retain sufficiently general perquisites enabling it to be embedded and connected into and with distinguished and essentially different informational entities, respectively.

In general, a function is never something without its roots from where it arose or is still arising. Several essential and general questions can come into the discourse before we list the axioms pertaining to informational function φ . Let us start with some basic questions.

(1) Which entity (informational operand) ψ produces φ ?

(2) For which purposes, marked by π , function φ is intended when produced by ψ ?

The last two questions can be united by the following formula:

$$(13) \quad (\psi \models \pi) \models \varphi$$

Since entity ψ with its purposes π is the main constructor of φ , process (13) is recursive in respect to ψ , that is, ψ -circular. This fact yields

$$(14) \quad ((\psi \models \pi) \models \varphi) \models \psi$$

The last formula can be particularized in an operand and operator way, that is,

$$(15) \quad ((\psi_{\text{func_prod}} \models_{\text{with}} (\pi_{\text{purpose}} \models_{\text{consider}} \sigma_{\text{sense}}, \sigma_{\text{significance}}, \iota_{\text{intention}})) \models_{\text{produce}} \varphi_{\text{function}}) \models_{\text{refer}} \psi_{\text{func_prod}}$$

The operand and operator entities of the last formula have the following particular meanings: $\psi_{\text{func_prod}}$ is a functional producer; π_{purpose} marks purposes which consider (operator $\models_{\text{consider}}$) operand entities as σ_{sense} , $\sigma_{\text{significance}}$, and $\iota_{\text{intention}}$; these purposes are with (operator \models_{with}) entity

$\psi_{\text{func_prod}}$; now, the functional producer with its purposes produces (operator \models_{produce}) function $\varphi_{\text{function}}$ and the whole process is in reference to (operator \models_{refer}) the functional producer $\psi_{\text{func_prod}}$. In this way, the function arises cyclically, influencing backwards its producer with certain purposes.

The next question is: (3) From which distinguished informational domain ξ does function φ depend and how does it produce a result ρ for purposes π ?

Through this axiomatic question, function φ becomes together with domain ξ the producer of result ρ . In this point we introduce a shortened form of formal expression of »function φ of domain ξ «, that is

$$(16) \quad \varphi(\xi) \Rightarrow (\varphi \models_{\text{of}} \xi)$$

where \models_{of} reads »inform(s)_of«, »inform(s)_on_the_basis_of«, »depends_on/upon«, etc. Since both entities φ and ξ can be composed formulas, the expression $\varphi(\xi)$ can also be understood in the functional sense. For instance, functional form $\alpha(\beta \models \gamma)$ means that α is a function of entity $\beta \models \gamma$; further, functional form $(\alpha \models \beta)(\gamma \models \delta)$ would mean that entity $\alpha \models \beta$ is a function of $\gamma \models \delta$. In fact, these functional expressions are shortcuts of both formulas $\alpha \models_{\text{of}} (\beta \models \gamma)$ and $(\alpha \models \beta) \models_{\text{of}} (\gamma \models \delta)$.

Question (3) can now be formally expanded in the following basic and general way:

$$(17) \quad \varphi(\xi) \models ((\xi \models \varphi) \models ((\rho \models \pi) \models \psi))$$

The particularized form of the last formula is

$$(18) \quad \varphi_{\text{function}}(\xi_{\text{domain}}) \Rightarrow ((\xi_{\text{domain}} \models_{\text{influence}} \varphi_{\text{function}}) \models_{\text{produce}} ((\rho_{\text{result}} \models_{\text{for}} \pi_{\text{purpose}}) \models_{\text{of}} \psi_{\text{func_prod}}))$$

In the last formula, one can see how the result of the function and its domain within certain purposes become a function of the functional producer as well. It seems that the functional producer pre-determines, in the realm of its own purposes, not only the function which it produces, but also to some informational extent the functional result itself. This comment may concern specifically any con-

struction of the so-called scientific functional dependencies, where the role of the functional producer is left to the scientist.

The next question pertains to the functional domain: (4) *To which informational domain α a functional domain ξ does belong and by which selecting entity β it is identified as a significant domain of the function φ ?*

As one may expect, there is an entity β somewhere, clearly identified or unconscious, which performs the selection of an adequate informational functional domain ξ out of a broader informational realm α in the way to satisfy the producer purposes of producing of φ . The initial formula of selection is, for instance,

$$(19) \quad \beta \models ((\xi \subset \alpha) \models \varphi(\xi))$$

The particularized form of this formula is, for instance,

$$(20) \quad \beta_{\text{selector}} \models_{\text{selects}} ((\xi_{\text{domain}} \subset \alpha_{\text{func_domain}}) \models_{\text{for}} (\varphi_{\text{function}}(\xi_{\text{domain}})))$$

The next question concerns the How of selector β : (5) *Is β an autonomous selector of domain ξ which selects ξ out of the realm α by its own strategy σ_{strategy} ?*

The strategy of selector is by itself an informational function, that is, $\sigma_{\text{strategy}}(\beta_{\text{selector}})$. Thus the entity which selects is embedded in the selector, and formula (20) can be expressed more precisely as

$$(20') \quad (\beta_{\text{selector}} \models_{\text{by}} \sigma_{\text{strategy}}) \models_{\text{selects}} ((\xi_{\text{domain}} \subset \alpha_{\text{func_domain}}) \models_{\text{for}} (\varphi_{\text{function}}(\xi_{\text{domain}})))$$

Additional questions to the preceding ones may be the following:

(6) *Is the domain (realm) α already clearly distinguished, identified, so it can serve as a background in producing functional domain ξ by selector β ?*

(7) *How does function φ as entity $\varphi(\xi)$ produce a purposely oriented result ρ ?*

(8) *To which informational domains does ρ belong, for instance, $\rho \subset \alpha, \beta, \xi, \pi, \varphi, \psi$?*

(9) *How can the functional scheme φ be expressed explicitly (in a predicating way, operationally), for instance,*

$$\varphi \models_{\text{of}} \xi, \alpha, \beta, \pi, \psi;$$

$$\rho \models_{\text{of}} \varphi(\xi)$$

etc. and what is the form of the hierarchy, if specifically possible (linear, circularly interweaved) among entities?

(10) *What does the functional scheme of a recursive character, that is, $\varphi_1(\varphi_2(\dots\varphi_n(\xi_n)\dots))$, mean?*

Questions (1) to (10) spread the possibilities of the functional axiomatization enormously. In concrete cases, different axioms pertaining to specific situations and attitudes come to the surface.

At the end of this section, let us mention the following evident example of a recursive informational functional structure: the mind is a function of a concrete living brain; a thought is a function of the mind; a distinguished thought item is a function of the thought; the distinguished thought item, the thought, and the mind impact the arising of the brain, for instance, the appearance of new neurons and neuronal interconnections; thus, the brain is a function of its own phenomenality, that is, of thought items, thoughts, and the mind in its entirety; etc.

Further, the functional expression $\varphi(\xi)$ means that, in general, the functional structure and organization as an informational phenomenon, which is an acting entity, is sketched in a framing (intuitive, approximate) form and not determined yet too precisely. In case of a precise formulation of functional phenomenality, expression $\varphi(\xi)$ can imply various predicative, that is, operational forms of functional construction, for instance, $\varphi \models_{\text{of}} \xi$, $\xi \models_{\text{with}} \varphi$, $\varphi \models_{\text{in}} \xi$, etc. As we have seen, the functional phenomenality can take into consideration many parallel formulas which impact informationally the basic functional entity $\varphi(\xi)$.

6. Axioms of Basic Metaphysical

Informing

Informational metaphysics concerns a thing in itself, that what an entity *is* by its own internal structure and organization, form and process, as it exists in itself. This view offers a more complex comprehension than that of *philosophia prima* or *supernatural imagery*.

The initial metaphysical situation of entity α is given by four metaphysical cases marking the basic, alternative basic, negative, and alternative negative informing of entity α in itself:

$$\alpha \models \alpha; \alpha \models \neg \alpha; \alpha \not\models \alpha; \alpha \not\models \neg \alpha$$

We shall limit our examination to case $\alpha \models \alpha$. In fact, this case will be decomposed axiomatically with the intention to give the basic starting points for further, that is, concrete decomposition (metaphysical projection).

Within metaphysics of operand α we are confronted with three basic phenomena: informing \mathfrak{I} of entity α , marked by $\mathfrak{I}(\alpha)$; counter-informing \mathfrak{C} of entity α , marked by $\mathfrak{C}(\alpha)$; and informational embedding \mathfrak{E} of entity α , marked by $\mathfrak{E}(\alpha)$. These are three basic metaphysical functions of informing of α . Three groups of basic *parallel* metaphysical axioms can be posited:

- (21) *Informing axioms:*
 $(\alpha \models \alpha) \Rightarrow \mathfrak{I}(\alpha)$;
 $\mathfrak{I}(\alpha) \Rightarrow ((\alpha \models \mathfrak{I}(\alpha)) \models \alpha)$;
 $(\alpha \models \alpha) \Rightarrow ((\mathfrak{I}(\alpha) \models \alpha) \models \mathfrak{I}(\alpha))$;
Counter-informing axioms:
 $(\alpha \models \alpha, \gamma \models \gamma) \Rightarrow \mathfrak{C}(\alpha)$;
 $(\gamma \models \gamma) \subset (\alpha \models \alpha)$;
 $\mathfrak{C}(\alpha) \subset \mathfrak{I}(\alpha)$;
 $\mathfrak{C}(\alpha) \Rightarrow ((\alpha, \gamma \models \mathfrak{C}(\alpha)) \models \alpha, \gamma)$;
 $(\alpha \models \alpha, \gamma \models \gamma) \Rightarrow$
 $((\mathfrak{C}(\alpha) \models \alpha, \gamma) \models \mathfrak{C}(\alpha))$;
Embedding axioms:
 $(\alpha \models \alpha, \gamma \models \gamma, \varepsilon \models \varepsilon) \Rightarrow \mathfrak{E}(\alpha)$;
 $(\varepsilon \models \varepsilon) \subset (\alpha \models \alpha)$;
 $\mathfrak{E}(\alpha) \subset \mathfrak{I}(\alpha)$;
 $\mathfrak{E}(\alpha) \Rightarrow ((\alpha, \gamma, \varepsilon \models \mathfrak{E}(\alpha)) \models \alpha, \gamma, \varepsilon)$;
 $(\alpha \models \alpha, \gamma \models \gamma, \varepsilon \models \varepsilon) \Rightarrow$
 $((\mathfrak{E}(\alpha) \models \alpha, \gamma, \varepsilon) \models \mathfrak{E}(\alpha))$

In this system α marks the basic entity (operand, thing), γ is used as the marker of α 's counter-informational component, and ε as the marker of α 's embedding component, by which the arisen component γ and other information is connected to α . The last parallel system of axioms pertaining to metaphysics $\alpha \models \alpha$ results systematically into

- (22) *Metaphysical informing:*
 $(\alpha \models \alpha) \Rightarrow \mathfrak{I}(\alpha)$;

$$\begin{aligned} &(\alpha \models \alpha, \gamma \models \gamma) \Rightarrow \mathfrak{E}(\alpha); \\ &(\alpha \models \alpha, \gamma \models \gamma, \varepsilon \models \varepsilon) \Rightarrow \mathfrak{E}(\alpha); \\ &\textit{Metaphysical hierarchy:} \\ &(\gamma \models \gamma, \varepsilon \models \varepsilon) \subset (\alpha \models \alpha); \\ &\mathfrak{E}(\alpha), \mathfrak{C}(\alpha) \subset \mathfrak{I}(\alpha); \\ &\textit{Decomposition of } \alpha, \gamma, \textit{ and } \varepsilon: \\ &\mathfrak{I}(\alpha) \Rightarrow ((\alpha \models \mathfrak{I}(\alpha)) \models \alpha); \\ &\mathfrak{C}(\alpha) \Rightarrow ((\alpha, \gamma \models \mathfrak{C}(\alpha)) \models \alpha, \gamma); \\ &\mathfrak{E}(\alpha) \Rightarrow ((\alpha, \gamma, \varepsilon \models \mathfrak{E}(\alpha)) \models \alpha, \gamma, \varepsilon); \\ &\textit{Decomposition of } \mathfrak{I}(\alpha), \mathfrak{C}(\alpha), \textit{ and } \mathfrak{E}(\alpha): \\ &(\alpha \models \alpha) \Rightarrow ((\mathfrak{I}(\alpha) \models \alpha) \models \mathfrak{I}(\alpha)); \\ &(\alpha \models \alpha, \gamma \models \gamma) \Rightarrow \\ &\quad ((\mathfrak{C}(\alpha) \models \alpha, \gamma) \models \mathfrak{C}(\alpha)); \\ &(\alpha \models \alpha, \gamma \models \gamma, \varepsilon \models \varepsilon) \Rightarrow \\ &\quad ((\mathfrak{E}(\alpha) \models \alpha, \gamma, \varepsilon) \models \mathfrak{E}(\alpha)) \end{aligned}$$

To the parallel metaphysical axioms, the cyclic or serial axioms can be introduced in which the occurring components α , $\mathfrak{I}(\alpha)$, γ , $\mathfrak{C}(\alpha)$, ε , and $\mathfrak{E}(\alpha)$ are positioned into middle-long and long metaphysical cycles. One of the axioms pertaining to the long metaphysical cycle is, for instance,

$$(23) \quad (\alpha \models \alpha) \Rightarrow \\ ((((((\alpha \models \mathfrak{I}(\alpha)) \models \gamma) \models \mathfrak{C}(\alpha)) \models \varepsilon) \\ \models \mathfrak{E}(\alpha)) \models \alpha)$$

Other long axioms can be obtained by the permutation of operand components in the last axiom.

6. Axioms of Informational Intelligence

Wo der Wurf des mathematischen Entwurfs gewagt wird, stellt sich der Werfer dieses Wurfes auf einen Boden, der allererst im Entwurf entworfen wird. Im mathematischen Entwurf liegt nicht nur eine Befreiung, sondern zugleich eine neue Erfahrung und Gestaltung der Freiheit selbst, d.h. der selbstübernommenen Bindung. Im mathematischen Entwurf vollzieht sich die Bindung an die in ihm selbst geforderten Grundsätze.

—Martin Heidegger [FND] 75

Entities inform according to axiom (1) which represents *informatio prima* from which axiomatic consequences can follow in a mathematically projective way. How can entities inform intelligently and what are the prerequisites of intelligent type of informing? Intelligence seems to be merely a pred-

icate (property, faculty) belonging to an informing entity. Thus, the way to intelligent informing of entities must proceed from the axiom (1) which has to be particularized for the case of intelligent informing.

An informational entity can have such or another intelligent position or attitude in the general and particular sense. The majority of readers would agree that an intelligent entity (IE) informs some of the facts, concepts, or fiction in the following six initial points:

(1) IE informs (expresses, describes) something (an entity) in an evaluating, observing, or understanding way;

(2) IE produces the so-called meaning, sense, spirit, and/or significance of something as information;

(3) IE forecasts, analyses, and synthesizes information concerning something under dynamic, unforeseeable, uncertain, and indeterminate circumstances;

(4) IE brings unknown, unconscious, invisible, impossible information concerning something to the surface;

(5) IE is spontaneously and circularly oriented, intentional, and goal-directed when it observes itself and evaluates various possibilities for its own development;

(6) IE behaves as a living entity in the world where it plays the struggle for its own benefit, delight, survival, etc.

Following the axiomatic route demonstrated for the general informing of entities (operator \models) in formulas (1) to (12), for an intelligently informing entity ι the following particular and significant axioms can be considered:

- (1¹) $\iota \Rightarrow (\iota \models_{\text{intelligent}});$
 (2¹) $\iota \Rightarrow (\models_{\text{intelligent}} \iota);$
 (3¹) $(\iota \models_{\text{intelligent}}) \Rightarrow (\models_{\text{intelligent}} \iota);$
 (4¹) $(\models_{\text{intelligent}} \iota) \Rightarrow (\iota \models_{\text{intelligent}});$
 (7¹) $\iota \Rightarrow (\iota \models_{\text{intelligent}} \iota);$
 (10¹) $\iota \Rightarrow (\iota \models_{\text{intelligent}}; \models_{\text{intelligent}} \iota);$
 (11¹) (1°) $\iota \Rightarrow (\iota \models_{\text{intelligent}})$ [intelligent externalism of ι]
 (2°) $\iota \Rightarrow (\models_{\text{intelligent}} \iota)$ [intelligent internalism of ι]
 (3°) $\iota \Rightarrow (\iota \models_{\text{intelligent}} \iota)$ [intelligent metaphysics of ι]
 (4°) $\iota \Rightarrow (\iota \models_{\text{intelligent}}; \models_{\text{intelligent}} \iota)$

[intelligent phenomenalism of ι]

Let us have the following dictionary of the primary four informational cases of intelligent informing:

- (12¹) (1°) $\iota \models_{\text{intelligent}}$: intelligent external intelligent informing of ι ;
 ι 's intelligent informational impacting;
 ι 's intelligent informing (informingness)
 (2°) $\models_{\text{intelligent}} \iota$: intelligent internal informing of ι ;
 ι 's intelligent informational impactedness;
 ι 's intelligent informedness
 (3°) $\iota \models_{\text{intelligent}} \iota$: intelligent metaphysical informing of ι ;
 ι 's intelligent metaphysical circularity;
 ι 's intelligent informational metaphysicalness
 (4°) $\iota \models_{\text{intelligent}}; \models_{\text{intelligent}} \iota$: intelligent phenomenal informing and informedness of ι ;
 ι 's intelligent informing and informedness phenomenality;
 ι 's intelligent complex phenomenalism

There are different modes of intelligent general informing and it is possible to make a rough classification in the following sense:

- intelligent general informing*: operator $\models_{\text{intelligent}}$;
intelligent alternative general informing: operator $\models_{\text{intelligent}}$;
intelligent negative general informing: operator $\not\models_{\text{intelligent}}$;
intelligent alternative negative general informing: operator $\not\models_{\text{intelligent}}$;
intelligent parallel general informing: operator $\parallel \models_{\text{intelligent}}$;
intelligent parallel alternative general informing: operator $\parallel \not\models_{\text{intelligent}}$;
intelligent parallel negative general informing: operator $\parallel \not\models_{\text{intelligent}}$;

intelligent parallel alternative negative
general informing: operator $\nexists_{\text{intelligent}}$;
intelligent cyclic general informing:
operator $\vdash_{\text{intelligent}}$;
intelligent cyclic alternative general
informing: operator $\neg_{\text{intelligent}}$;
intelligent cyclic negative general
informing: operator $\nabla_{\text{intelligent}}$;
intelligent cyclic alternative negative
general informing: operator $\nexists_{\text{intelligent}}$;
intelligent parallel-cyclic general informing:
operator $\parallel_{\text{intelligent}}$;
intelligent parallel-cyclic alternative
general informing: operator $\neg_{\text{intelligent}}$;
intelligent parallel-cyclic negative general
informing: operator $\nabla_{\text{intelligent}}$;
intelligent parallel-cyclic alternative
negative general informing:
operator $\nexists_{\text{intelligent}}$

We see how intelligent informing of an entity ι is nothing else than any other particular informing of this entity. Intelligence is merely a specific perquisite of the entity which produces »intelligent« information concerning something which this entity evaluates, observes, or understands. Thus, to the basic axiomatic system of an intelligently informing entity ι the parallel system can be added, considering the previous six initial points (1) to (6) of intelligent informing. The markers and to them corresponding meanings of the Greek and Fraktur operands and operators are the following:

β_{benefit} benefit
 $\beta_{\text{benefit}}(\sigma)$ something's own benefit; benefit of something
 $\Upsilon_{\text{circumst}}$ circumstance(s)
 δ_{delight} delight
 $\delta_{\text{delight}}(\sigma)$ something's own delight; delight of something
 $\delta_{\text{development}}$ development
 δ_{dynamic} dynamics
 $\delta_{\text{dynamic}}(\Upsilon_{\text{circumst}})$ dynamic circumstances
 ι_{indeterm} indeterminacy
 $\iota_{\text{indeterm}}(\Upsilon_{\text{circumst}})$ indeterminate circumstances
 ι intelligently informing entity
 $\iota(\sigma)$ entity intelligently concerning

something
 $\iota_{\text{impossible}}$ impossible, the
 $\iota_{\text{impossible}}(\sigma)$ impossible concerning something, the
 $\iota_{\text{invisible}}$ invisible, the
 $\iota_{\text{invisible}}(\sigma)$ invisible concerning something, the
 λ_{live} liveliness
 $\lambda_{\text{live}}(\in_{\text{entity}})$ living entity
 μ_{meaning} meaning
 $\mu_{\text{meaning}}(\sigma)$ meaning of something
 $\pi_{\text{possibility}}$ possibility/possibilities
 $\pi_{\text{possibility}}(\iota(\delta_{\text{development}}))$ possibility of intelligent entity development
 σ something (an arbitrary entity to be »understood« by ι)
 σ_{sense} sense
 $\sigma_{\text{sense}}(\sigma)$ sense of something
 $\sigma_{\text{significance}}$ significance
 $\sigma_{\text{significance}}(\sigma)$ significance of something
 σ_{spirit} spirit
 $\sigma_{\text{spirit}}(\sigma)$ spirit of something
 σ_{struggle} struggle
 $\sigma_{\text{struggle}}(\beta_{\text{benefit}}(\sigma), \delta_{\text{delight}}(\sigma), \sigma_{\text{survival}}(\sigma), \dots)$ struggle of something's own benefit, delight, survival, etc.
 σ_{survival} survival
 $\sigma_{\text{survival}}(\sigma)$ something's own survival; survival of something
 $\upsilon_{\text{uncertain}}$ uncertainty
 $\upsilon_{\text{uncertain}}(\Upsilon_{\text{circumst}})$ uncertain circumstances
 $\upsilon_{\text{unconscious}}$ unconscious, the
 $\upsilon_{\text{unconscious}}(\sigma)$ unconscious concerning something, the
 $\upsilon_{\text{unforeseeable}}$ unforeseeable, the
 $\upsilon_{\text{unforeseeable}}(\Upsilon_{\text{circumst}})$ unforeseeable circumstances
 $\upsilon_{\text{unknown}}$ unknown, the
 $\upsilon_{\text{unknown}}(\sigma)$ unknown concerning something, the
 $\mathfrak{B}_{\text{world}}$ world

\models_{analyze}	analyze(s)
\models_{behave}	behave(s)
$\models_{\text{circular}}$	is/are_circular
$\models_{\text{evaluate}}$	evaluate(s)
$\models_{\text{forecast}}$	forecast(s)
$\models_{\text{generate}}$	generate(s); bring(s)_to_the_surface
$\models_{\text{goal_directed}}$	is/are_goal-directed
\models_{in}	is/are_in; inform(s)_in
$\models_{\text{intentional}}$	is/are_intentional
\models_{observe}	observe(s)
\models_{play}	play(s)
\models_{produce}	produce(s)
$\models_{\text{spontaneous}}$	is/are_spontaneous
$\models_{\text{synthesize}}$	synthesize(s)
\models_{under}	is/are_under; inform(s)_under
$\models_{\text{understand}}$	understand(s)

The six additional paragraphs pertaining to IE can now be formalized by the corresponding informational formulas as parts of the informational system of IE ι . For the first sentence and its formula we have:

- (13¹.1) *IE informs (expresses, describes) something (an entity) in an evaluating, observing, or understanding way;*
 $(\sigma \models (\iota \models_{\text{intelligent}} \iota)) \Rightarrow$
 $(\iota \models_{\text{evaluate}} \sigma; \iota \models_{\text{observe}} \sigma;$
 $\iota \models_{\text{understand}} \sigma)$

In this formula, IE ι , that is, its metaphysics $\iota \models_{\text{intelligent}} \iota$, is the intelligent observer of σ , so, it evaluates, observes, and understands σ . The second sentence and its formula is:

- (13¹.2) *IE produces the so-called meaning, sense, spirit, and/or significance of something as information;*
 $\iota \models_{\text{produce}}$
 $(\mu_{\text{meaning}}(\sigma), \sigma_{\text{sense}}(\sigma), \sigma_{\text{spirit}}(\sigma),$
 $\sigma_{\text{significance}}(\sigma))$

The third sentence together with its formula is

- (13¹.3) *IE forecasts, analyses, and synthesizes information concerning something under dynamic, unforeseeable, uncertain, and indeterminate circumstances;*
 $(\iota \models_{\text{forecast}} \iota(\sigma); \iota \models_{\text{analyze}} \iota(\sigma);$
 $\iota \models_{\text{synthesize}} \iota(\sigma)) \models_{\text{under}}$
 $(\delta_{\text{dynamic}}(\Upsilon_{\text{circumst}});$
 $\cup_{\text{unforeseeable}}(\Upsilon_{\text{circumst}});$
 $\cup_{\text{uncertain}}(\Upsilon_{\text{circumst}});$
 $\iota_{\text{indeterminate}}(\Upsilon_{\text{circumst}}))$

The fourth sentence and formula are:

- (13¹.4) *IE brings unknown, unconscious, invisible, impossible information concerning something to the surface;*
 $\iota \models_{\text{generate}}$
 $(\cup_{\text{unknown}}(\sigma); \cup_{\text{unconscious}}(\sigma);$
 $\iota_{\text{invisible}}(\sigma); \iota_{\text{impossible}}(\sigma))$

The fifth sentence and its formula are

- (13¹.5) *IE is spontaneously and circularly oriented, intentional, and goal-directed when it observes itself and evaluates various possibilities for its own development;*
 $((\iota \models_{\text{spontaneous}}; \iota \models_{\text{circular}};$
 $\iota \models_{\text{intentional}}; \iota \models_{\text{goal-directed}})$
 $\models_{\text{observe}} \iota) \models_{\text{evaluate}}$
 $\pi_{\text{possibility}}(\iota(\delta_{\text{development}}))$

The sixth sentence and its formula are

- (13¹.6) *IE behaves as a living entity in the world where it plays the struggle for its own benefit, delight, survival, etc.;*
 $((\iota \models_{\text{behave}} \lambda_{\text{live}}(\in_{\text{entity}}))$
 $\models_{\text{in}} \mathbb{B}_{\text{world}}) \models_{\text{play}}$
 $\sigma_{\text{struggle}}(\beta_{\text{benefit}}(\sigma), \delta_{\text{delight}}(\sigma),$
 $\sigma_{\text{survival}}(\sigma), \dots)$

7. The Syntax of Informational Formulas

In this essay we have used various informational formulas from the beginning, in the most basic axioms. In parallel, we developed a foundation of the so-called operand-operator (O-O) theory which could be understood also outside the so-called informational realm as a mathematical theory. We

