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ON TRIPLET CLASSIFICATIONS OF CONCEPTS[2]

Abstract: The scheme for classifications of concepts is introduced. It has founded on the triplet model of concepts. In this model a concept is depicted by means of three kinds of knowledge: a concept base, a concept representing part and the linkage between them. The idea of triplet classifications of concepts is connected with a usage of various specifications of these knowledge kinds as classification criteria. (Author).

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1. Introduction

Concepts have been the object of much concentrated attention in many branches of contemporary science. There are a lot of approaches to their study. In what follows concepts will be considered as elementary units of knowledge and its organisation [4]. However, concepts are not formless entities. Circumstantial evidence of this fact is that there are numerous controversial models of concepts. Practically either model has advantages and some empirical confirmation. Because of this

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[1] The author thanks the Research Council of Norway for supporting this study.

[2] The author recommends to select the definite concept that a reader possesses (or thinks to possess) and to try analysing it with ideas and definitions exposed in this paper. He would be very grateful for receiving the information on counter-examples to the triplet model.

it is reasonable to suggest that the particular model of concepts reflects several specific aspects of the "same" unit of knowledge that has been called a "concept". The hypothesis of this paper is that a concept has a rather complex and unusual structure and composition. One may think about a concept like a composite thing known only through its numerous projections. Our first aim will be to introduce such a model of concepts that has opened perspectives of the unified description of such projections. The second aim is to apply this model to classifications of concepts.

2. The Triplet Modelling of Concepts

The results of current concept analysis do not permit one to be certain and final in his or her knowledge of what concepts are. There are now only reasonably detailed, formal and adequate models of a concept. These depict in various ways different properties and structures of concepts. The triplet model [6, 7, 8] has united and developed further various concept characteristics that were introduced by other models.

According to the triplet model, any concept may be associated with three kinds of information. The first is the knowledge about a base of a concept. The second one is the knowledge of a representing part of a concept. The third is the knowledge about a linkage between the base and the representing part. It should be noted that there are different ways of structuring these three knowledge kinds.

Let us consider the concept of some entity **e**. This entity may have real, ideal, or mental nature. It may be a thing, an object, a process, a state, a thought, number or an appropriate set, collection, class or group of these. Since the origin of modern science the leading strategy of investigating entities has been the selecting (monadic, dyadic, etc.) properties of entities in question, establishing and describing relationships between their properties of various orders. One may associate with this strategy the following chain (for simplicity reasons only one single entity is taken and the chain is considered as linear):

an entity → first order properties of an entity → first order relations between first order properties → first order relations between entity properties and properties of other entities → ....→ *n*-th order properties → ....

The knowledge about the concept base has been centred around such ontological structuring of the reality under study. This structuring has been expressed in so called ontological hypothesis of modern culture and science. Even now we cannot be sure about accepted hypothesis on what are entities and their properties and relations. These hypotheses have been changing permanently, at least in fundamental physics and biology. However, the ontological structuring has remained without changes. One of possible ways of general depicting this ontological structuring is a usage of the constructions of abstract properties and set scale.

An abstract property ***P*** is a triple (D, p, Sc) where D is a set of entities d which may possess the property in question, Sc is a scale of the property, and p is a partial function assigning the element(s) $p(d) = sc \in Sc$ to an entity with the name $d \in D$ [1, 3].

For example, the property of physical bodies that is usually called "***velocity***" may be modelled as an abstract property in the following manner. Here D is the direct product of the set of all physical bodies by the set of all physical frames of reference, Sc is the set of three dimensional vectors, and p is realised by means of some procedures of measuring and calculating the value of ***velocity*** for a given body.

The set scale is built step by step through the application in definite order operations of set union, set product and constructing power-set to the basis X of the set scale $S(X)$. The basis is a collection of sets X_1, X_2, ..., X_n . On each step while constructing a set scale one obtains its definite level consisting of some sets. The set scale $S(X)$ is the union of all its levels [2].

Levels of a set scale may be used for ordering (hypothetical) knowledge about entities and their properties of various orders.

The knowledge about the representing part of a concept has been structured in another way. It is organised according to the rules of human representative and communicative systems, primarily natural and artificial languages and knowledge systems. These systems have expanding and revising resources (sign, symbolic, lexical, syntactical, semantical, imagerial, modelling, operational, transformational and others). In a sense the horizon of these systems defines what we can specifically state about the general ontological structuring of reality.

However, the relationship between the reality and our representative and communicative systems is not a simple one-to-one correspondence between the entities of the former and elements of the latter. The components of such relationships have been created by means of many kinds of operations and processes and are not without change. The knowledge about the linkage of a concept has centred around these operations and processes.

2.1. The Base of a Concept

To introduce the definition of the concept base we need the following explications.

Let the universe of discourse *U* be the set of all entities about which it is possible to think by means of concepts. The set *U* also contains properties of these entities, relations (dyadic properties) between entities, relations between properties, properties of relations, properties of properties (properties of the second order with respect to entities), etc.

To avoid undesirable associations from here on we shall use, if necessary, capital bold symbols, letters, words, word combinations for denoting concepts. Instances of the concept denotation are **C, ELEMENTARY PARTICLE, HADRON, ANIMAL, HUMAN, SOCIETY** on so forth. Entities that are falling under a concept will be connoted as **c, elementary particle, hadron, animal, human, society**. Correspondingly, the names of a concept might be **“C”, “ELEMENTARY PARTICLE”, “HADRON”, “ANIMAL”, “HUMAN”, “SOCIETY.”** The names of the entities that are subsumed under a concept might be “**c”, “elementary particle”, “hadron”, “animal”, “human”, “society”**. It is possible to say that the name or term of a concept “is its component which conveniently summarises or synthesises and represents a concept for the purpose of designating a concept in communication” [4, p.144]. Generally as a name or term of a concept, not only lexically simple names may function, but also more complex linguistic structures like compound names, sentences, and even texts.

A concept **C** has, as a rule, many names of the kind *N*(**C**). The same is true for the entities falling under a concept. The names in question differ in their exactness, effectiveness, simplicity and so on. There are many relationships between the names of the “same” concept as well of the names of the “same” entity falling under a concept.

In this paper concepts will be considered as a complicated unit of knowledge about elements from *U*. It is a matter of fact that by means of a given concept **C** one might be informed of only about specific elements or subsets of *U*.

Moreover, any such informing with the help of a concept **C** takes place in some conditions ***K***. Aside from describing these conditions in detail, we mention only that these have been associated with individual’s mental and interpretative abilities, skills and tools, available knowledge, purposes, and even psychic state.

Bearing these distinctions and conventions in mind, we introduce

*Definition 1***.** Under the conditions $\boldsymbol{K}$ the ground set $G_{\boldsymbol{K}}(\mathbf{C}) \subseteq U$ of the concept **C** is a set of all elements g such that 1) are denoted by the name $N_{\boldsymbol{K}}(\mathbf{C})$ of the concept **C** and 2) are referred to by means of concept **C**.

Under the traditional logical treatment the terms “extension” or “volume” have been frequently used for denoting the ground set of a concept. The term “category” is in use in cognitive science and psychology. Elements $g \in G_{\boldsymbol{K}}(\mathbf{C})$ fall or subsume under the concept **C**. In cognitive science and psychology these elements are also called “instances” or “exemplars” of a concept. Dahlberg has used for denoting g such names as an “item of reference” and “referent” [4].

However, the association of the ground set with a concept is only a first step in its triplet modelling. Indeed, the knowing of the concept **C** presupposes also the possibility of indicating and describing, at least, qualitatively some properties and relations of elements from $G_{\boldsymbol{K}}(\mathbf{C})$. This means that the knowledge about such properties and relations are important features of a concept. Knowledge about these is essential for a concept as a knowledge unit. Such knowledge is also a principal part of the concept use in ordinary thinking. Besides this, the usage of scientific concepts has presupposed quantitative descriptions of some properties and relations of elements from $G_{\boldsymbol{K}}(\mathbf{C})$ and their values, the establishing correlation between properties under consideration, etc. As a rule, the set of some properties in question is called concept “intension” or “content”. Cognitive scientists and psychologists also separate different kinds of such properties: a prototype and a core. A prototype is a set of properties that are assumed to occur in some instances. A core is a set of properties that are singly necessary and jointly sufficient for membership of an entity in the concept’s category [9].

Thus, there is a need of depicting in precise terms the information, on one hand, on the concept ground set and, on the other hand, on some properties and relations of elements and subsets from the ground set. One way to do this is to use the construction of a set scale $S(X)$ described above.

In the case of triplet concept modelling, the basis X of the corresponding concept set scale necessarily includes the ground set G ($G = X_1$). It is very important, that by means of selecting the appropriate basis it is possible to depict by means of the set scale properties and relations of G and its elements and subsets. For this purpose along with the ground set G, the basis should include auxiliary sets that are scales of properties and relations of elements from G. Examples of auxiliary sets are real numbers, vector spaces, truth values, etc.

Definition 2. The base $B_{\boldsymbol{K}}(\mathbf{C})$ (in relation to the conditions $\boldsymbol{K}$) of the concept **C** includes elements of $G_{\boldsymbol{K}}(\mathbf{C})$ and not their properties and relations other than needed for the usage of **C** in conditions $\boldsymbol{K}$. These properties and relations are modelled by means of subsets from finite number of levels of the set scale $S(G^*)$ with the basis $G^* = \{G_{\boldsymbol{K}}, X_2, ..., X_n\}$, where $X_2, ..., X_n$ are auxiliary sets.

It may be shown that namely various structures of the concept base (under an appropriate option of the ground set, the basis of the set scale and their algebraic description) are objects of modelling that has been successfully developed by R.Wille and his collaborators [10; 11].

2.2. The Representing Part of a Concept

Apparently elements from the concept ground set and properties of these elements do not bear their names, descriptions, statements about these, etc. Such structures are human creations. Thus, any realistic concept model should take into account this fundamental, and usually neglected, fact. Without the loss of generality we may speak of only about the linguistic form of existence of these structures. Here language is understood in a very broad sense. The second triplet characteristic of a concept -- its representing part -- contains instances of this linguistic form.

Let us assume that we use some language L with the alphabet A, the vocabulary V, the set P of word combinations, the set E of expressions (sentences) and the set T of texts. The language L may include sublanguages (sign, pictorial, natural, artificial, common, scientific, mathematical, etc.). The basis L^* of set scale $S(L^*)$ of language L is $\{A, V, P, E, T\}$. In principle $S(L^*)$ contains everything expressible in the language L.

Definition 3. The representing part $R_{\boldsymbol{K}}(\mathbf{C}) \subseteq S(L^*)$ of the concept **C** is a set of linguistic units and structures by means of those the base $B_{\boldsymbol{K}}(\mathbf{C})$ of a concept **C** is depicted (mapped, represented) under conditions $\boldsymbol{K}$ in some knowledge system.

For example, the representing part of the physical concept **ELECTRON** contains the following elements: symbol e (the element of A); word "electron" (the element of V); "material carrier of elementary electric charge" (the element of P); "electron is a constituent of atom", "electrons interact by means of electromagnetic force", "electron has a rest mass of 9.1 X 10^{-28} gram" (the elements of E); "the electron is a fermion, a type of particle named after the Fermi-Dirac statistics that describes its behaviour. It has a half-integral spin - spin constitutes the property of intrinsic angular momentum in quantum-mechanical terms" (the element of T) [5, p.435].

The representing part of pre-scientific concept **ATOM** contains an image of small, indivisible pieces of matter. The representing part of its scientific counterpart includes quantum-mechanical wave functions, various theoretical models of **atoms**, schematic pictures of electron orbitals, etc.

Components of the concept representing part differ in their representative and expressive capacity. Some of them only denotate the base as a whole, its selected subsets, and its individual elements. Other baptise properties and relations of elements from the ground set. The third group of components gives more or less complete and/or exact description of elements from the base or even their properties and relations. The fourth group models properties and relations in question.

There are closed and non-trivial links between different kinds of elements from the representing part of scientific concepts. Moreover, these elements are intimately connected to empirical and theoretical knowledge systems and classifications available in the corresponding science. In this sense the representing part of scientific concepts is knowledge dependent.

According to Dahlberg' model "a *verifiable statement* is the component of a concept which states an attribute of its *item of reference*" [4, p.144]. Such a component is a specific element of the set *E* that conveys verifiable knowledge about some property of elements or their combinations from the ground set of a concept.

2.3. The Linkage of a Concept

The entities (from the ground set and base) have been associated with the appropriate components from the representing part by means of human activity. In this sense such associations are results of human actions. As such, these are dependent on developmental levels of civilisation, culture, language, science, person's knowledge, purposes and mental capacities. These are conditional and ephemeral, but necessary for building (forming) concepts. Thus, there is a need of more careful characterisation of links between elements and structures from the concept base and components and structures from the concept representing part.

Let us point out only some aspects of links under consideration.

There are many ways of their establishing: by custom, by training, by language acquisition, by convention, by analogy, by procedure, etc. From the point of view of concept functions the usage of three letters "**man**" for denoting **MAN** is accidental. Ukrainians use the set of six letters ("**ëþäèíà**") while Germans use another set of six letters ("**Mensch**"). At the same time there are universal scientific procedures for finding values of such a property of **macroscopic bodies** as ***velocity*** for any given material body. The accuracy and exactness of these procedures may change eventually.

The almost commonly accepted approach treats the links between components of concept representing part and elements from the concept base as simple naming relations. The former components play the role of names and the latter elements play the role of entities baptised by the appropriate former components. However, naming relations that assign names to entities are a specific kind of these links. For example, if the representing part of a concept contains some mathematical model of a property from the concept base, then this model not only names the property but also in principle gives the knowledge about the values of this property and even about relationships between this property and others.

Without going into details, one may separate various kinds of links between the components and their sets from the representing part and the elements and subsets from the base. Among these are reference links (naming, denoting, describing, visualising, imaging), truth links, and modelling links.

From what has been said it might be assumed that the knowledge on links in question is a very important part of any reasonable concept model.

Definition 4. The third triplet characteristic $Lin_{\boldsymbol{K}}(\mathbf{C})$ of a concept **C** is the system of links (linkage) between the base $B_{\boldsymbol{K}}(\mathbf{C})$ and the representing part $R_{\boldsymbol{K}}(\mathbf{C})$.

It is of fundamental importance, that for any concept this linkage is the outcome of very complex (sensual, perceptual, mental, scientific, etc.) activity.

For example, for the common concept **ANIMAL** the linkage in question has been established by means of sensual perception. For the synonymous scientific concept the construction of such a linkage is realised in the framework of the available scientific knowledge and connected with conducting observations and measurements.

It is supposed that **electrons** are unobservable entities. If it is true, then for different versions of scientific concept **ELECTRON** its linkage cannot be principally established by means of procedures of direct observation. This linkage is constructed by means of measurement and application of appropriate knowledge systems (theory of measurement, electron theory, quantum mechanics). This means that some links from the linkage of the concept **ELECTRON** are realised through processes of abstraction, idealisation, modelling, calculation, approximation and so forth.

For many scientific concepts there is a possibility of controlling the linkage between their bases and representing parts. In particular, the measurement and calculation procedures permit one to attribute quite specific linguistic and mathematical (numeric, vector, etc.) values to definite properties and relations of entities from the ground set of a concept. It should be noted that the concept linkage is transforming with the changes in scientific equipment, methods of its use and available scientific theories.

2.4. The Triplet Model of a Concept

In the light of the discussion above it is apparent that the reliable concept model should take into account all three kinds of knowledge about concepts. Without any of these one may speak of only about incomplete concept modelling. Certainly, there are many successful applications of various incomplete concept models. However, the complete concept models give more profound and deep insight into concepts.

From stated above one may obtain

Definition 5. Under conditions $\boldsymbol{K}$ the triplet model $T_{\boldsymbol{K}}(\mathbf{C})$ of the concept $\mathbf{C}$ is the triple ($B_{\boldsymbol{K}}(\mathbf{C})$, $Lin_{\boldsymbol{K}}(\mathbf{C})$, $R_{\boldsymbol{K}}(\mathbf{C})$), where $B_{\boldsymbol{K}}(\mathbf{C})$ is the base of $\mathbf{C}$, $R_{\boldsymbol{K}}(\mathbf{C})$ is the representing part of $\mathbf{C}$, and $Lin_{\boldsymbol{K}}(\mathbf{C})$ is the linkage between $B_{\boldsymbol{K}}(\mathbf{C})$ and $R_{\boldsymbol{K}}(\mathbf{C})$.

We would like to stress the relative nature of these and other definitions connected with concepts. The specific treatment of a concept depends not only on concept itself, but also on one's approach to it.

3. The Triplet Classifications of Concepts

Let us consider briefly the idea of triplet classifications of concepts.

Under it practically any working (common or scientific) concept belongs to many classes. One may take as classification criteria isolated characteristic of the base or representing part or linkage between these. The base of a concrete concept is some subset of the universe of discourse U.

The classes and subclasses of concepts obtained are depicted in the tables 1-3. The sequence of dots symbolises the possibility of an extension of the type of classes mentioned above dots.

3.1. The Base Classifications

If one takes such characteristics of the base as its set-theoretic cardinality; the relation between the base and *U*; set scale composition; kinds of set-theoretical descriptions; status of entities from the ground set; the way by which the base is given to a person, etc., he or she may obtain the following (incomplete) list of concept classes.

Criterion of classification	**Value of criterion**	**Concepts classes and subclasses**
Cardinality of G	*The ground set contains*	
	no elements	*G*-empty
	one element	*G*-singular
	set of elements	*G*-general
	finite set	*G*-finite
	infinite set	*G*-infinite
	countable set	*G*-countable
	uncountable set	*G*-uncountable
Relation between G and U	*The ground set is*:	
	equal to *U*	*U*-universal
	a subset of *U*	*U*-non-universal
	a superset of *U*	*U*-super-universal
	....	....
Ontological status of elements from G	*The type of elements*	
	Thing (object)	*G*-object
	Event	*G*-eventual
	Situation	*G*-situational
	Process	*G*-processual
	Action	*G*-actional
	Intentions	*G*-intentional
	....	....
Domain of existence of G	*The type of domain*	
	Physical reality	*G*-real
	Psychics	*G*-mental
	Communication	*G*-communicative
	....	....
Set-theoretical composition of G	*The ground set contains*	
	only individual elements	*G*-individual
	only subsets of individual elements	*G*-collective
	....	....
Set scale composition of B	*The base contains*	
	properties $\{P(g \in G)\}$ of individual elements *g* from *G*	$B\{P(g \in G)\}$-attributive
	properties $\{P(G^* \subseteq G)\}$ of subsets G^* of G	$B\{(G^* \subseteq G)\}$-attributive
	....	....
	relations $\{R\}$ between individual elements *g* from *G*	$G\{R(g)\}$-relational
	....	....
	relations between subsets G^* of *G*	$G\{R(G^*)\}$-relational
	....	....
Set-theoretical kind of a structure Str from B		

	Standard set	*BStr*-sharp
	Multiset	*BStr*-multiset
	Fuzzy set	*BStr*-fuzzy
	....	....
The way by which a structure Str from B is given to a person		
	Perception	*BStr*-perceptual
	Experience	*BStr*-empirical
	Experiment	*BStr*-experimental
	Abstraction	*BStr*-abstracted
	Idealisation	*BStr*-idealised
	....	....
Change of a structure Str from B		
	No-variation of *Str*	*BStr*-stable
	Variation of *Str*	*BStr*-variative
Parameter of variation of a structure Str from B		
	Time variable	*BStr*-temporal
	Space variable	*BStr*-spatial
	Cause variable	*BStr*-causal
Type of cause of variation of s structure Str from B		
	Randomness	*BStr*-random
	Probability	*BStr*-probabilistic
	Statistics	*BStr*-statistical
	Determination	*BStr*-deterministic
	....	
Localisation of cause of a variation of a structure Str from B		
	Inside *Str*	*BStr*-internal
	Outside *Str*	*BStr*-external
Cardinality of a set of causes of a variation of a structure Str from B	*The set contains*	
	One cause	*BStr*-monocausal
	Many causes	*BStr*-multicausal
	....	....
	....	....

Table 1. The base classifications of concepts

3.2. The Representing Classifications

The representing classification of concepts may be constructed just as the base classification. Let *L* be some language. The classes followed are given relative to *L*.

Criterion of classification	**Value of criterion**	**Concepts classes and subclasses**
Cardinality of R	*The representing part contains*	
	no elements from *L*	*RL*-no-named
	one element from *L*	*RL*- single-named
	set of elements from *L*	*RL*- multi-named
	finite set	*RL*- finite-named
	infinite set	*RL*- infinite-named
	countable set	*RL*- countable-named
	uncountable set	*RL*- uncountable-named
Relation between R and L		
	L includes all needed for *R* elements	*RL*- expressible
	L includes some needed for *R* elements	*RL*- partially expressible
	L does not include needed for *R* elements	*RL*- non-expressible
	R is a fuzzy subset of *L*	*RL*-fuzzy-expressible
	....	....
Type of language L used for expression of structure Str from R		
	The sphere of usage Us of L	
	Common life	*RLUsStr*-natural
	Science	*RLUsStr*-scientific
	Units of alphabet A	
	Pictograms	*RLAStr*-pictogramic
	Signs	*RLAStr*-sign
	The kind of sentence construction rules C	
	Informal	*RLCStr*-informal
	Formal	*RLCStr*-formal
	The semantics Sem of sentences	
	Assertions	*RLSemStr*-assertoric
	Models	*RLSemStr*-model
	Problems	*RLSemStr*-problem
	Operations	*RLSemStr*-operational
	Procedures	*RLSemStr*-procedural
	Algorithms	*RLSemStr*-algorithmic
	....	....
	The kind of sentence transformation rules T	
	Informalised	*RLTStr*-informalised
	Formalised	*RLTStr*-formalised
Kind of a structure Str from R		
	Mental images (pictures)	*RStr*-imagerial (pictorial)
	Impression	*RStr*-impressional
	Lexical units of *L*	*RLStr*-lexical
	Letters	*RLStr*-symbolic
	Words	*RLStr*-lexicographic
	Simple words	*RLStr*-simple-lexicographical
	Complex words	*RLStr*-complex-lexicographical
	Word combinations	*RLStr*-phrasal
	Sentences	*RLStr*-sentential

	Texts	*RLStr*- textual
Structure of lexical unit Un of L	*The unit has structure of*:	
	Scalar	*RLUn*- scalar
	Vector	*RLUn*- vector
	Spinor	*RLUn*- spinor
	Matrix	*RLUn*- matrix
	Metric	*RLUn*-metrical
	Topology	*RLUn*-topological
	Fractal	*RLUn*-fractal
		....
Kind of a set-theoretical description of a structure Str from R	*The theory of*	
	Standard sets	*RStr*-sharp
	Multisets	*RStr*-multiset
	Fuzzy sets	*RStr*-fuzzy
	....	....
Access to a structure Str from R		
	Momentary Time interval	*RStr*-momentary *RStr*-temporal
	....	....
Psychic form of fixation of structure Str from R		
	Consciousness	*RStr*-conscious
	Unconsciousness	*RStr*-unconscious
Storage of a structure Str from R		
	Working memory	*RStr*-short-term
	Long-term memory	*RStr*-long-term
	....	....
Type of knowledge system which a structure Str from R belongs to		
	Common knowledge	*RStr*-common
	General knowledge system	*RStr*-general
	Special knowledge system	*RStr*-special
	Science	*RStr*-scientific
	Mathematics	*RStr*-mathematical
	Logic	*RStr*-logical
	Physics	*RStr*-physical
	Social science	*RStr*-social
	Psychology	*RStr*-psychological
	....	....
	Theology	*RStr*-theological
	Philosophy	*RStr*-philosophic
	....	....
Type of organisation of knowledge system which a structure Str from R belongs to		
	Theory	*RStr*-theoretical
	Formal system	*RStr*-formal
	Formalised system	*RStr*-formalised
	....	....
Nature of change of a structure Str from R		
	No regularities	*RStr*-irregular
	Patter-obeyed	*RStr*-regular
Kind of processing a structure		

Str from R		
	Ordinary thinking	*RStr*-informal
	Formal thinking	*RStr*-formal
	Mathematical thinking	*RStr*-mathematical
	Computer processing	*RStr*-computational
	....	....
	....	....

Table 2. The representing classifications of concepts

3.3. The Linkage Classifications

One may also construct concept classifications on the base of different characteristics of the concept linkage.

Criterion of classification	**Value of criterion**	**Concepts classes and subclasses**
Modality of a structure Str from Lin		
	Necessity	*LinStr*-necessary
	Potentiality	*LinStr*-potential
	Intentionality	*LinStr*-intentional
	Contingency	*LinStr*-contingent
	....	....
Purposefulness of a structure Str from Lin		
	There is a purpose	*LinStr*purposeful
	There is no purpose	*LinStr*-non-purposeful
	....	....
Way of constructing of a structure S from Lin		
	By socialisation	*LinStr*-socialised
	By general education	*LinStr*-generally educational
	By special education	*LinStr*-specially educational
	....	....
Determination of a structure Str from Lin		
	Unconditionality	*LinStr*-unconditional
	Conditionality	*LinStr*-conditional
	....	....
Character of the operation by which a structure Str from Lin is realised		
	Without control	*LinStr*-uncontrolled
	Under control	*LinStr*-controlled
	Convention	*LinStr*-conventional
	Ostensive indication	*LinStr*-ostensive
	Operation	*LinStr*-operational
	Measurement	*LinStr*-measurable
	Computation	*LinStr*-computational

	....	....
Function of a structure Str from Lin		
	Referring	*LinStr*-referring
	Modelling	*LinStr*-modelling
	Truth-bearing	*LinStr*-adequate
	....	....
	....	....

Table 3. The linkage classifications of concepts

Certainly, some names of concepts appear to be very unusual. However, the triplet classifications open the way to transform such names in the terms of the future concept theory.

The reader may try to find the membership of concepts (that are known to him) to classes of triplet classifications. Some memberships are rather obvious, others are in a need of special investigation and substantial knowledge. Undoubtedly, he or she will find how deep and profound is his or her knowledge associated with some concepts.

4. Further Developments

It is also possible to introduce concept classifications with two or three criteria. They are the combined characters of the base and the representing part; the base and the linkage; the representing part and linkage; the base, the representing part and the linkage.

The paper has realised several so called monadic classifications that have mainly based on internal structures of concepts as single monads. However, so called relational classifications are most often used. An example is the classification based on the relation of subordination between concepts. The triplet modelling of concepts permits one substantially to expand and make more precise such classifications.

The triplet classifications of concepts are not without use in comparison of the maturity degrees of different concepts, in study of types and trends of concept developments, in analysis of specific of knowledge organisation at the level of concepts.

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