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INFORMATION BLOCKS AND THEIR KEY LANGUAGE UNITS IN TERM DEFINITIONS

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Abstract

The article is devoted to the study of the peculiarities of the term definition modelling by means of information blocks, as well as singling out key words and expressions as key language units for their construction drawing on the example of the Russian-language nanotechnology, political and ecological terms and their definitions in specialized (terminological) dictionaries. There are main and additional information blocks in term definitions. The authors consider the structure of definition of each term from the selected corpus of 350 units from Nanotechnology, Political and Ecological spheres, determine the key language units which verbalize the systemic relations between related notions realized in the corresponding term definitions. As a result of the analysis some of the most productive Russian key language units for definition construction were defined. The authors come to the conclusion that the specificity of each type of information blocks is correlated with the systemic relations that exist between terms of a certain field of knowledge, regardless of its scientific-technical, socio-political or ecological nature. The lexical composition of an information block can vary and include both terms, conceptually connected with the defining lexeme (directly or indirectly), and general lexis units. All main information blocks are commonly used in Nanotechnology, Political Science and Ecology definitions.

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1. Introduction

Nowadays the language of science plays an important role in the study of different academic and professional disciplines, for example, Political Science and Ecology. According to the opinion of a number of researchers, it is the definition that is a specific obligatory feature of a term (Danilenko, 1977; Kandelaki, 1977; Popova, 2011). Definition reflects specific features of the described notion, which makes it possible to differentiate this or that particular notion from the others, it contains a minimal volume of information necessary for delimitation of one notion from the other. “A technical term is considered to be “the name” of a notion while a definition is the extended comprehensive interpretation of this name” (Razduev, Latu, & Mironenko, 2015; Superanskaya, Podol’skaya, & Vassil’eva, 2012, p. 14). One of the mechanisms for the study of the content of a notion presented in the definition of the term is definition modelling (Smirnova, 2011).

2. Problem Statement

The definitions of Nanotechnology, Political Science and Ecology terms have not yet been studied thoroughly enough from the viewpoint of the presence of main and additional information blocks. Their key language units in nanotechnology, political and ecological term definitions have not been identified and described.

3. Research Questions

The first question is to identify the specificity of main and additional information blocks in such fields of knowledge, as Nanotechnology, Political Science and Ecology and determine the frequency of use of these blocks. The second question is to analyze the lexical composition of each type of information block and identify the most productive language units that are frequently used for the construction of the information blocks in Nanotechnology, Political Science and Ecology term definitions.

4. Purpose of the Study

The article is devoted to the study of the peculiarities of definition modeling by means of the prototypic information blocks of different types. The analysis is aimed at defining the information blocks in the definitions of nanotechnology, political and ecological terms and the most productive key language units that are used to build them. The study and modelling of definitions of nanotechnology, political and ecological terms will help to eliminate uncertainty in the use of terms, minimize any misunderstanding between scientists by means of constructing “right” definitions and standardization, bring mutual understanding, unity and cooperation in the corresponding spheres, improve the efficiency of studying the phenomena of these fields of knowledge and communication between scientists around the world.

5. Research Methods

At the first stage nanotechnology, political and ecological terms and their definitions were selected. Then the structural and component analysis and modelling of the definitions have been carried

out that helped to identify the main and additional semantic definition blocks in their structure. At the second stage, more or less frequently used key language units of these definition blocks have been singled out. The comparative analysis has been used to see if there are some common and different features of definition construction by means of prototypic information blocks in the spheres of Nanotechnology, Political Science and Ecology.

Each mental category of academic concepts predetermines the specificity of its definition. The definition can be structured and divided into prototypical information blocks according to the transmitted data. All information blocks in definition can be subdivided into 1) *main* (Generic affiliation, Attributes, Constituents, Location, Subject relations, Object relations, Purpose, Cause and effect, Instrument, Property reference) and 2) *additional* (Subsuming concepts, Examples, Opposition, Analogy, Additional data) (see: Latu, 2017). Main information blocks, as compared to the additional ones, are compulsory for revealing the basic meaning of the term and giving information of prototypical aspects of the notion which are mainly the reason of differentiation between two referents.

6. Findings

Generic affiliation information block contains certain information about the direct generic concept the defining referent belongs to. This information block is based on two types of systemic relations in terminological networks: **AKO** (“a kind of”, the relation between hypernyms and hyponyms) and **ISA** (“is a”, the relation of concurrence or inclusion in a set) (for more information about different systemic relations between adjacent terms see: Latu, 2018). For example: **Kray** – *rossiyskaya {territorial’no-administrativnaya edinitsa}...* (Sanzharevsky, 2010) (Translation: **Kray** – *a Russian {territorial and administrative unit}...*). Some of the most productive key language units that are used to build this information block are “–”, “eto”, “tip”, “raznovidnost”, etc.

Information block of **attributes** contains certain information of qualitative and quantitative characteristics and properties of the referent, its unique characteristics, such as size, form, mass / weight, speed / velocity, volume, density, temperature, brightness, etc. For example: **Elektorat** – *kruglits, {obladayushchikh pravom golosa} navyborakh* (Sirota, 2012) (Translation: **Electorate** – *a circle of persons {with the right to vote} at the elections*). Some of the most productive key language units that are used to build this information block are “kharakterizuyetsya”, “obladayet”, “svoystvenno”, “s”, etc.

Information block of **constituents** reveals certain elements of structure, components, which form the defining referent or indicate to another referent as its part, and represents the systemic relation **PO** (“part of”, a connection of a part and a whole. The indicators (verbalizers) of this information block in the Russian language are “sostoitiz” (“consists of”) and “vvide” (“in the form of”). For example: **Gomopolimer** – *polimer, {makromolekuly kotorogo sostoyat iz odinakovykh po sostavu i stroyeniyu povtoryayushchikhsya strukturnykh edinits} (monomernykhzven’yev)* (<http://thesaurus.rusnano.com/wiki/article739>) (Translation: **Homopolymer** – *polymer which {macromolecules consist of the iterative structural units of the same composition and structure} (Monomeric units)*). Some of the most productive key language units that are used to build this information block are “sostoitiz”, “iz”, “vkluychayet”, “chast”, etc.

Main information block of **location** contains certain information of location or localization of the defining phenomenon. This block is based on the systemic relation **Loc** (“locus”, “location”, the systemic relations between referents, one of which is the location of the other). For example: *Desorbtsiya – umen’sheniyekontsentratsiikomponenta {v poverkhnostnom sloye veshchestva (nagranitse razdelafaz)}* (<http://thesaurus.rusnano.com/wiki/article765>) (Translation: *Desorption – decrease in the concentration of the component {in the surface layer of the substance (at the phase boundary)}*). Some of the most productive key language units that are used to build this information block are “na”, “nakhoditsya”, “raspolozhena”, “soderzhit”, etc.

Information block of **Subject relations** reflects information that the defining referent is determined by the description of actions being their initiator or information of other initiators of different processes. The systemic relations **S** (“subject”) is established between the term representing the subject of action and the term verbalizing this action in the terminological network. For example: *Producenty (sozidateli) – organizmy, {sinteziruyushchiye slozhnyye organicheskiye soyedineniya} iz prostykh neorganicheskikh* (<https://uchebnikfree.com/pochv-agroekologiya-ekologiya/terminyi-ponyatiya-upotrebyaemye-25937.html>) (Translation: *Producers (creators) – organisms, {synthesizing complex organic compounds} from simple inorganic substances*). Some of the most productive key language units that are used to build this information block are “osushchestvlyayet”, “sovershayet”, etc.

Information block of **Object relations** contains the indication that the defining referent is an object of influence in a certain process or informs of the object of such an action. This information block is based on the systemic relation **Obj** (“object”), the systemic relation between the referent that is an object of influence of a process and the process itself. Forexample: *Indenter – tverdyy predmet opredelennoy geometricheskoy formy i razmerov, {vdavlivayemyy} v poverkhnost’ issleduyemogo materiala...* (<http://thesaurus.rusnano.com/wiki/article873>) (Translation: *Indenter - a solid object of a certain geometric shape and dimensions, {pressed} into the surface of the analyzed material...*). Some of the most productive key language units that are used to build this information block are “podverzhen”, as well as the use of Passive voice forms of verbs associated with the defining referent.

Main information block of **purpose** specifies the information of goals of the use or assignment of the defining referent that partly determine its specificity. For example: *Opticheskiyvolnovod – volnovod {dlyanapravlennoyperedachisvetovyxsignalovilisvetovoyenergii}* (<http://thesaurus.rusnano.com/wiki/article23824>) (Translation: *Optical waveguide – waveguide {for directed transmission of light signals or light energy}*). Some of the most productive key language units that are used to build this information block are “dlya”, “ispol’zuyetsyadlya”, “ispol’zuyetsyastsel’yu”, etc.

The **cause and effect** information block can also be found in the term definition, this block represents the information of peculiarities of origin of the defining referent or results of the associated activity. This information block is based on the systemic relation **R** (“result”, the result between the action and its result). For example: *Effekt Doplera – izmeneniye vosprinimayemoy chastoty kolebaniy, {vyzvannoye dvizheniyem istochnika i/ili priyemnika voln}* (<http://thesaurus.rusnano.com/wiki/article2071>) (Translation: *Doppler effect – a change in the perceived oscillation frequency, {caused by the movement of the source and / or wave receiver}*). Some of the most

productive key language units that are used to build this information block are “vrezul'tate”, “poluchayemyy”, “vyzvannyy”, etc.

Instrument information block contains certain information of the means of action, tools used in this or that process. This block is represented by the systemic relation **Inst** (“instrument”, the systemic relation between referents, one of which is a process and another is an instrument in this process). For example: *Dializ –udaleniye iz kolloidnykh system i rastvorov vysokomolekulyarnykh soyedineniy primesey nizkomolekulyarnykh veshchestv {s pomoshch'yu polupronitsayemykh membran}* (<http://thesaurus.rusnano.com/wiki/article777>) (Translation: *Dialysis – the removal of impurities of low-molecular substances from colloidal systems and solutions of high-molecular compounds {with the help of semipermeable membranes}*). Some of the most productive key language units that are used to build this information block are “s pomoshch'yu”, “pripomoshchi”, “s primeneniyyem”, etc.

Main information block of **property reference** indicates certain information of an object that possesses the quality expressed by the defining term-characteristic. This block is presented by the systemic relation **At** (attributiveness). Foreexample: *Superparamagnetizm – kvaziparamagnitnoye povedeniye {vshchestv i materialov}, sostoyashchikh iz nanorazmernykh ferro- ili ferrimagnitnykh chastits...* (<http://thesaurus.rusnano.com/wiki/article1759>) (Translation: *Superparamagnetism– quasi-paramagnetic behaviour of {substances and materials} consisting of nanoscale ferro- or ferrimagnetic particles...*

Information block of **examples** gives some information of illustrative and qualifying character. This block of examples reflects the semantic relations **AKO** (“a kind of”) or **ISA** (“is a”) formed between the defining notion and other notions presented in this block. For example: *Voyna– otkrytoye vooruzhennoye nasiliye so storony organizovannykh vooruzhennykh sil gosudarstva ili inykh politicheskikh struktur ({naprimer, vooruzhennyye otryady povstantsev, napravlyayemyye oppozitsiyye protiv ofitsial'nykh vlastey})* (http://www.gumer.info/bibliotek_buks/polit/dict/01.php) (Translation: *War – open armed violence by the organized armed forces of the state or other political structures ({for example, armed rebel groups directed by the opposition against the official authorities})*). Some of the most productive key language units that are used to build this information block are “naprimer”, “primerom yavlyayetsya”, etc.

Information block of **opposition** contains the information of co-hyponym which is opposed to the defining term by one or a number of characteristics. In the terminological network these terms are correlated by the systemic relation **Op** (“opposition”). For example: *Antiutopiya – protivopostavleniye ponyatiyu {“utopiya”}, nezhelatel'naya model'...* (Deishle & Lobzhanidze, 2012). (Translation: *Dystopia – opposition to the notion of {“utopia”}, an undesirable model...* Some of the most productive key language units that are used to build this information block are “protivopostavlen”, “v otlichyeyot”, “protivopolozhnyy”, etc.

Information block of **subsuming concepts** is characterized by the information of specific notions for which the defining notion is a hypernym and systemic relations **AKO**. Foreexample: *Biologicheskoye raznoobraziye– raznoobraziye zhivykh organizmov, a takzhe ekosistem i ekologicheskikh protsessov... Mozhet byt' razdeleno na tri kategorii: {geneticheskoye raznoobraziye, raznoobraziye vidov i raznoobraziye ekosistem}* (Ibragimova, Rakhimov, & Ziyatdinova, 2012).

(Translation: **Biological diversity** – the diversity of living organisms, as well as ecosystems and ecological processes... It can be divided into three categories: {genetic diversity, species diversity and ecosystem diversity}). Some of the most productive key language units that are used to build this information block are “podrazdelyayetsya na”, “raznovidnostyami yavlyayutsya”, “vklyuchayet klassy”, etc.

Information block of **analogy** is presented by the information of the referent with which an analogy is carried out in the definition and which is not one of the co-hyponyms. For example, in the sphere of Nanotechnology we have the following definition: **Kvantovaya tochka**– *chastitsamateriala s razmerom, {blizkim k dlivolnyelektrona v etomateriale}*... (<http://thesaurus.rusnano.com/wiki/article935>). (Translation: **Quantum dot** – a particle of a material with a size {close to the wavelength of the electron in this material}...). Some of the most productive key language units that are used to build this information block are “blizkiy k”, “kak”, “skhodny s”, “pokhozhiyna”, etc.

The block of **additional information** contains other information of the defining referent which is of qualifying character, for example, the data about the discoverer or developer, the time or place of appearance or organization, etc. For example: **Mezhdunarodnyye organizatsii**– *odna iz osnovnykh organizatsionno-pravovykh form mezhdunarodnogo sotrudnichestva... {Pervoy mezhdunarodnoy organizatsiyey byl Vsemirnyy pochtovyi soyuz, sozdannyy v 1875 g.}* (Deishle & Lobzhanidze, 2012). (Translation: **International organizations** – one of the main organizational and legal forms of international cooperation... {The first international organization was the Universal Postal Union, established in 1875.}). Some of the most productive key language units that are used to build this information block are “termin vveden”, “proiskhodit ot nazvaniya”, “v tom chisle”, etc.

7. Conclusion

Thus, the specificity of each type of information blocks is correlated with the systemic relations that exist between terms of a certain field of knowledge. The lexical composition of an information block can vary and include both terms, conceptually connected with the defining lexeme (directly or indirectly), and general lexis units. The structural and component analysis and modelling of the definitions of the selected terms helped to identify the most productive language units that are frequently used for the construction of each type of information blocks. These linguistic markers coincide in the spheres of Nanotechnology, Political Science and Ecology. All main information blocks are commonly used in Nanotechnology, Political Science and Ecology definitions. Additional information blocks are usually represented in all three spheres by the blocks of examples and of additional information. Less common definition blocks are of opposition, of analogy, of subsuming concepts.

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References

- Danilenko, V. P. (1977). *Russkaya terminologiya: opyt lingvisticheskogo opisaniya [Russian terminology: the experience of linguistic description]*. Moscow: Nauka.
- Deishle, V. A., & Lobzhanidze, A. A. (2012). *Politologiya: terminologicheskiy slovar' [Political Science: Terminological Dictionary]*. Moscow: MADI.
- Ibragimova, K. K., Rakhimov, I. I., & Ziyatdinova, A. I. (2012). *Slovar'-spravochnik terminov po ekologii i okhraneprirody [The Dictionary-Handbook of Ecology and Nature Protection Terms]*. Kazan': Otechestvo.
- Kandelaki, T. L. (1977). *Semantika i motivatsiya terminov [Semantics and motivation of terms]*. Moscow: Nauka.
- Latu, M. N. (2017). Academic concepts organization in semantic networks and its reflection in some structural blocks of definitions. In *Abstracts & Proceedings of the 4th International Conference on Education and Social Sciences* (pp. 450-454). Istanbul: International Organization Center of Academic Research.
- Latu, M., (2018). Tipy sistemnykh otnosheniy mezhdu terminami v setevykh modelyakh organizatsii nauchnogo znaniya [The types of systemic relations between technical terms in the academic knowledge network models]. *Voprosy Kognitivnoy Lingvistiki [Issues of Cognitive Linguistics]*, 4, 134-142.
- Popova, L. V. (2011). *Lingvisticheskiy termin: problema kachestva (Opyt sostavleniya «Kompleksnogo slovarya terminov funktsional'noy grammatiki») [Linguistic term: The problem of quality (The experience of creating a "Complex dictionary of Functional Grammar Terms")]*. Moscow: Flinta.
- Razduev, A. V., Latu, M. N., & Mironenko, Ye. V. (2015). Evolution and present state of the English nanotechnology technical terms. *European Journal of Science and Theology*, 11(3), 79-88.
- Sanzharevsky, I. I. (2010). *Politologiya: Slovar'-spravochnik [Political Science: Dictionary-handbook]*. Moscow: Politologiya, RGU.
- Sirota, N. M. (2012). *Politologiya: Klassikinauki. Terminy. Testy [Political Science. Classics of Science. Terms. Tests]*. Saint-Petersburg: Publishing House of Saint Petersburg State University of Aerospace Instrumentation.
- Smirnova, Yu. S. (2011). *Definitsionnoe modelirovanie v terminologicheskom pole sepsis: kognitivno-diskursivnyy aspekt [Definition modelling in the terminological field "sepsis": a cognitive-discursive aspect]*. Perm: Perm State University.
- Superanskaya, A. V., Podol'skaya, N. V., & Vassil'eva, N. V. (2012). *Obshchaya terminologiya: Voprosy teorii [General terminology: Theoretical issues]*. Moscow: "Librokom" Publishing House.